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Water

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# **Environmental Supplemental Impact Statement Final**

Wastewater Treatment  
Facilities-Sludge  
Management System  
Albuquerque, New Mexico



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**  
**REGION VI**  
**1201 ELM STREET**  
**DALLAS, TEXAS 75270**

September 20, 1982

TO ALL INTERESTED AGENCIES, OFFICIALS, PUBLIC GROUPS AND INDIVIDUALS:

Enclosed is a copy of the Final Supplemental Environmental Impact Statement (EIS) on the awarding of a grant under Section 201 of the Clean Water Act for construction of a sludge management system for the city of Albuquerque, Bernalillo County, New Mexico. This EIS has been prepared in compliance with the National Environmental Policy Act of 1969 and implementing regulations.

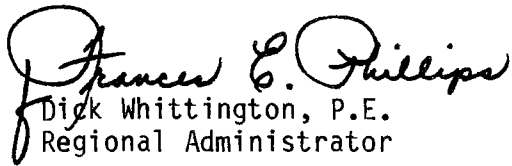
Because changes from the Draft Supplemental EIS are minor, this Final Supplemental EIS incorporates the Draft Supplemental EIS by reference and includes the following: (1) a revised and updated summary; (2) a revised alternatives discussion including changes to the city's proposed project; (3) EPA's proposed action; (4) revisions necessary to the draft Supplemental EIS; and (5) EPA's response to comments received on the Draft Supplemental EIS. This Final Supplemental EIS shall also serve as the Final Responsiveness Summary.

The Final Supplemental EIS is being distributed to those who made comments on the Draft Supplemental EIS and to those who requested a copy. The document is also available for review at the following locations:

- |  |  |
|--|--|
| 1. Albuquerque Public Library<br>Main Branch<br>501 Copper N.W.<br>Albuquerque, New Mexico                       | 4. Esperanza Branch Public Library<br>5600 Esperanza N.W.<br>Albuquerque, New Mexico               |
| 2. Prospect Park Branch Library<br>8205 Apache N.E.<br>Albuquerque, New Mexico                                   | 5. Los Griegos Branch Public Library<br>1000 Griegos N.W.<br>Albuquerque, New Mexico               |
| 3. Zimmerman Library<br>University of New Mexico<br>Government Publication Department<br>Albuquerque, New Mexico | 6. Albuquerque Wastewater Treatment<br>Plant No. 2<br>North Street S.W.<br>Albuquerque, New Mexico |

Comments or inquiries on this EIS should be addressed to Mr. Clinton B. Spotts, Regional EIS Coordinator, at the above address by the date stamped on the cover sheet following this letter.

Sincerely yours,

  
Francis E. Phillips  
Dick Whittington, P.E.  
Regional Administrator

Enclosure

FINAL SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT  
CITY OF ALBUQUERQUE, NEW MEXICO  
SLUDGE MANAGEMENT SYSTEM

Responsible Agency: US Environmental Protection Agency Region 6 (EPA)

Cooperating Agencies: US Department of Agriculture, Soil Conservation Service; US Department of Energy

Administrative Action: Award of a Construction Grant to the City of Albuquerque for an innovative/alternative sludge management system.

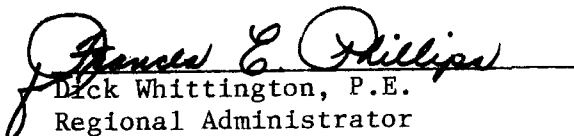
Contact for Further Information:

Clinton B. Spotts, Regional EIS Coordinator  
US Environmental Protection Agency (6ASAF)  
1201 Elm Street Dallas, Texas 75270  
(214) 767-2716 or FTS 729-2716

Comments on the Final Supplemental EIS Due: **15 NOV 1982**

Abstract: The City of Albuquerque proposes to construct a sludge management system consisting of sludge thickening and stabilization units at Treatment Plant No. 2, followed by transfer of sludge via pipeline to Montesa Park where the sludge will be mechanically dewatered, dried in a solar greenhouse, disinfected by irradiation with Cesium-137, and disposed by landspreading on public lands. EPA has evaluated the City's proposal and 13 additional alternatives. EPA has determined that the project currently proposed by the City is cost-effective and environmentally sound. EPA proposes to award a grant to the City of Albuquerque for the construction of their proposed project.

Responsible Official:

  
Dick Whittington, P.E.  
Regional Administrator

# **CHAPTER 1**

## **SUMMARY**

## 1.0 SUMMARY

### 1.1 DESCRIPTION OF ADMINISTRATIVE ACTION

The National Environmental Policy Act (NEPA) stipulates that each Federal agency shall " . . . include in every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment, a detailed statement by the responsible official on the environmental impact of the proposed action; any adverse environmental effects which cannot be avoided should the proposal be implemented; and alternatives to the proposed action . . ." This legislation is the basic framework for the Environmental Impact Statement (EIS).

One of the major EPA programs involving actions that may require an EIS is the Construction Grants Program, as authorized by the Municipal Wastewater Treatment Construction Grant Amendments of 1981 (Public Law 97-117). This law authorizes the Administrator of USEPA to make a grant(s) to a State, municipality, or intermunicipal or interstate agency for construction of publicly-owned treatment works. P.L. 97-117 made major provisional changes to the Clean Water Act of 1977 (CWA), Public Law 95-217. Many of the changes are directed toward emerging public philosophies, and address concerns about chemical pollution, resource conservation, resource recovery and recycling, environmentally compatible treatment systems, and streamlining Federal involvement in the planning and design of municipal wastewater treatment facilities. Key provisions of P.L. 97-117 that directly affect the construction grants program include:

- Municipalities will conduct planning and design efforts without Federal funding prior to requesting construction grants from EPA.
- Municipalities are required to consider alternative or innovative systems that provide for reclaiming, reuse, or recycling of wastewater; elimination of discharges; and recovery of energy. As an incentive for increased utilization of these systems, EPA may provide 85% funding (through September 1984) for alternative or innovative systems, as opposed to 75% for conventional systems, and will pay 100% of the cost of rebuilding or modifying an alternative or innovative system that fails to meet its permit conditions or shows higher operation and management (O&M) costs within two years of completion of construction. All potential Federal and State funding is subject to availability of limited construction grant funds.

- EPA may provide a 15% "cost effective bonus" (through September 1984) for alternative or innovative systems when compared in a cost-effectiveness analysis with conventional technologies.
- Applicants for grant funds must analyze methods, processes, and techniques to reduce use of or reclaim energy and to increase the open space and public recreation potential of lands, waters, and rights-of-way that are parts of a proposed project.
- The objectives of P.L. 97-117 for sewage sludge management are to ensure protection of public health and the environment by promulgation of minimum Federal standards for sludge disposal and utilization and to maximize beneficial uses of sludges that conform to Federal standards.

The principal technical planning document for wastewater collection and treatment in the City of Albuquerque, New Mexico, and several outlying areas is the Final Albuquerque Areawide Wastewater Collection and Treatment Facilities Plan, which was prepared by the City of Albuquerque in 1977 under the requirements of the CWA and funded by EPA as Grant No. C-35-1020-01 under the construction grants program. Since the award of additional grants for design and construction of any wastewater treatment facilities had the potential for significant impact(s) to the natural and human environment, EPA determined that preparation of an environmental impact statement (EIS) was necessary. Draft and Final EISs were published during June and August 1977, respectively. The 1977 Facilities Plan subsequently was incorporated into the Albuquerque/Bernalillo County Comprehensive Plan.

On 27 September 1978, EPA published in the Federal Register final regulations implementing significant changes caused by the CWA. Due to increased significance and new funding incentives placed upon systems involving innovative and alternative technology, energy conservation, resource recovery, new Federal regulations governing land application of wastewater sludges, increased public concern regarding odors, and desire to provide more in-depth analyses of some of the facilities plan proposals and alternative processes, the City of Albuquerque entered into a program of revising and upgrading its areawide facilities plan. An additional study entitled "City of Albuquerque, New Mexico Southside Wastewater Reclamation Plant No. 2 - Phase II Expansion Report" was published during January 1980. The final version of this report

was completed during January 1981 and was received by EPA as a draft facilities plan amendment on 27 January 1981. The City has initiated the review process required to adopt the report as a final facilities plan amendment and for having the final facilities plan adopted as an official amendment to the Albuquerque/Bernalillo County Comprehensive Plan.

EPA determined that the awarding of funds to implement the City's proposed changes was a major action with potentially significant impacts on the human environment, and on 22 August 1980 issued a Notice of Intent to prepare a Supplemental EIS (SEIS) on the City's proposed project. The Draft SEIS was distributed to the public for comment in September 1981.

## 1.2 DESCRIPTION OF PROPOSED PROJECT

The City of Albuquerque recognized a need for a modified sludge management program to supplement its wastewater treatment facilities because of the evolution of several situations:

- Increased quantities of sludge will be generated as a result of expansion of the City of Albuquerque wastewater collection system, expansion and modification of treatment Plant No. 2, and population growth in the Albuquerque area. Existing sludge drying beds are only adequate to handle approximately 35% of the 10,740 tons per year of dry solids projected for 1990. Compounding the problem, state-owned land being used for dedicated land disposal of excess sludge currently produced is available to the City only on an emergency basis.
- The public has expressed strong disapproval of sludge drying beds currently used at Plant No. 2 because of aesthetic and odor considerations.
- New Federal regulations (40 CFR, Part 257.3-6) governing application of sludge on land prohibit the continued practice of spreading sludge on parks or golf courses without prior disinfection.
- Numerous operation and maintenance problems with the City's current sludge management system have been encountered since the City's initial facilities plan was completed in 1977.

Because of these situations, the City's facilities plan amendment proposes design and construction of a new sludge management system. The City's



proposed sludge facilities include the following components (i.e., treatment units):

- Sludge thickening will be accomplished by expanded dissolved air flotation units at Plant No. 2.
- Stabilization will be accomplished by new, additional anaerobic digesters at Plant No. 2.
- Transportation of sludge to Montesa Park will be accomplished by pumping sludge through an 8" PVC pipeline approximately five miles long. Two lift stations will be required, one at Plant No. 2 and one approximately half way to Montesa Park.
- Conditioning of sludge prior to dewatering will be accomplished by adding organic polymer(s).
- Dewatering from 3% to 25% solids will be accomplished by using belt presses constructed inside an enclosed structure. Complete sidestream treatment and leachate control systems will be included.
- Drying from 25% to 40% solids will be accomplished using large, solar-heated greenhouses. Exhaust from the greenhouses will be scrubbed before being released into the atmosphere in order to remove odors to the greatest extent possible.
- Disinfection of the 40% solid sludge will be accomplished by exposing the sludge to Cesium-137, a nuclear waste product. This process will be conducted within a massive underground reinforced concrete irradiator. Following disinfection, the sludge will be stockpiled at Montesa Park. The stockpiling will take place inside an enclosed structure containing a leachate collection system.
- Disposal of the 90% solid, stockpiled sludge will be accomplished by the City Parks Department hauling sludge (up to 7000 tons per year) to city parks and golf courses for ultimate disposal by landspreading. An additional 3740 tons of sludge per year will be disposed on other public lands, or by selling to consumers either in bulk or in bags.

Federal financing for the proposed sludge management facilities has been requested by the City of Albuquerque. The City's consultants have estimated the total construction cost of the proposed sludge management facilities to be approximately \$26 million at December 1980 price levels (CDM 1980b). Under current EPA funding guidelines, the proposed project may be eligible for an 85% grant. In addition, the proposed project potentially is eligible for a 12.5% grant from the New Mexico Environmental Improvement Division (NMEID).

### 1.3 ENVIRONMENTAL CONSEQUENCES OF THE CITY'S PROPOSED PROJECT

Primary effects to earth resources will result from construction of the new sludge pipeline from Plant No. 2 to Montesa Park, and construction of sludge management components at Montesa Park. Soils along the pipeline route and at Montesa Park have moderately high erosion susceptibility characteristics, thus moderate short-term erosion at both sites is anticipated. Application of sludge at the land application sites (e.g., city parks and golf courses) will have beneficial effects upon the soil and park turf.

Direct impacts on surface water resources will be minor. Surface water quality in Tijeras Arroyo and the Rio Grande River will not be degraded significantly unless raw sludge is spilled via a pipeline break. Surface water quality will be improved over the long-term due to the improved removal of solids from the plant effluent.

No significant environmental effect on groundwater is anticipated due to construction and operation of the proposed project.

Direct air quality impacts of the proposed project will occur during the construction and operation phases. Moderate amounts of fugitive dust will be generated during plant construction, pipeline construction and construction of the sludge management components at Montesa Park. These fugitive dust emissions potentially will affect local residents sensitive (e.g., allergic) to dust. Operational impacts caused by long-term emissions from gas and diesel-fueled engines will not be significant. Secondary, minor air quality degradation will occur due to growth in the project area. Beneficial impacts to the population surrounding existing treatment plants will occur due to the abandoning of Plant No. 1 and the proposed improvements at Plant No. 2. Adverse odors are not anticipated from the new facilities at Montesa Park since odors will be minimized by scrubbing equipment and enclosed facilities.

Noise generated by construction of the sludge pipeline may cause disturbance to outdoor activities of persons living or active within approximately one-half mile of the construction activity. However, any one area is not expected to be affected by construction noise for a long period of time.

Noise effects in the vicinity of construction at Plant No. 2 and Montesa Park also will be temporary and short-term, and are not anticipated to be of significance.

Environmental consequences of the proposed project on terrestrial flora and fauna will be largely temporary. Disturbance of plant and animal communities by construction and operation of the proposed sludge pipeline and sludge management components will occur, but the proposed project will not destroy critical habitat or be deleterious to wildlife. No endangered terrestrial species are known to inhabit the proposed project site (i.e., Plant No. 2, pipeline route, and Montesa Park).

No presently known historical or archaeological resources will be affected by the proposed project. Should significant cultural resources be discovered during construction, the City will be required by grant condition(s) to notify EPA, the State Historical Preservation Officer (SHPO) and the Department of Interior.

As a direct result of the proposed action, very minimal changes in population size, characteristics and distribution in the project area will occur. No significant impact is anticipated on population due to the proposed project; however, it is recognized that the project will facilitate growth in the area.

Land use at Plant No. 2 and Montesa Park will remain as it currently exists (i.e., municipal facilities). Effects on neighboring land use should be minimal; however, construction of the pipeline would temporarily alter current land uses. Transportation systems in the project area will have to expand slightly to accept moderate project growth. Long-range comprehensive plans will have to be changed to include the City's proposed project.

Beneficial impacts on the local economy will be realized by the receipt of Federal and State grant funds.

No direct or indirect effects on energy use or supply are anticipated due to the proposed project.

No large scale direct or indirect environmental health effects are anticipated to occur to persons in the vicinity of the proposed project or to persons in the City of Albuquerque. Operators of the proposed irradiator potentially will have a lifetime risk of premature death from radiogenic cancer that is 0.05% above normal (i.e., 5 out of 10,000). The additional radiation (50 millirems per year) to which the operators will be exposed is equivalent to the additional yearly radiation dose a person will receive if he moves from a wooden home into a brick home. Living in a brick house contributes between 50 and 100 millirem (mrem), in a concrete house 70-100 mrem, and in a wooden house 30-50 mrem per year of radiation to the occupant (International Atomic Energy Agency, 1979).

Recreation activities that occur in and near Tijeras Arroyo will be temporarily affected during construction. No long-term effects upon recreation and aesthetics are anticipated due to operation of the proposed project.

It is noted that the City's proposed project does include several unavoidable adverse impacts. The preceding paragraphs describe environmental consequences that will occur due to implementation of the City's proposed project, including the many mitigative measures that will be incorporated by the City. Therefore, each of the adverse effects mentioned in the previous paragraphs are unavoidable adverse impacts. Construction and operation of the City's proposed project will also involve an irreversible and irretrievable commitment of labor, energy, fuel, construction materials, and land utilized as the project site.

#### 1.4 ALTERNATIVES EVALUATED

Several alternatives to the City's proposed action were evaluated by the City and/or EPA. One alternative to the proposed action is no action. Implementation of no action by the City would result in 60 mgd of wastewater in 1990 flowing into a treatment facility designed to treat 47 mgd, and with a sludge management system that is only able to handle the sludge produced by treating 30 to 33 mgd of wastewater. If the no action alternative was implemented, sludge produced by treating 30 to 33 mgd of wastewater would be dewatered on existing sand drying beds, and then stockpiled at Montesa Park.

Sludge produced by treating the remaining 27 to 30 mgd of wastewater potentially would be stored in sludge lagoons adjacent to treatment Plant No. 2. EPA has determined the no action alternative is not a feasible alternative.

The City of Albuquerque evaluated 7 action alternatives in their facilities plan (6 alternatives plus the proposed project). The City's alternatives primarily included evaluations of various transportation options (pumping sludge through pipelines, or hauling it by truck); various disinfection options (Cesium-137, electron beam, and composting); and various ultimate disposal options (landspreading, landfilling, and dedicated land disposal). EPA evaluated 14 action alternatives plus the no action alternative; however, the main options for transportation, disinfection, and disposal evaluated by EPA were basically identical to those evaluated by the City. The 14 action alternatives were grouped according to ultimate disposal method as follows: Group 1 alternatives (1A-1H) involved disposal by landspreading on public lands; Group 2 alternatives (2A-2B) involved disposal in a municipal landfill north of the City; and Group 3 alternatives (3A-3D) involved dedicated land disposal on one of two 3,580-ac sites west of the City. EPA has determined that all Group 1 alternatives qualify as innovative/alternative systems. EPA also determined that alternatives involving open air drying or composting are not environmentally sound.

The fact that sludge is a valuable resource is recognized by EPA. Information provided by the City, private consultants, and other Federal agencies concerning the monetary value of sludge in terms of dollars per ton was evaluated by EPA. EPA has determined a \$70/ton credit acceptable for all Group 1 alternatives, since these alternatives include ultimate disposal of sludge on public lands as a soil conditioner.

A cost-effectiveness analysis determined that, of the remaining alternatives, the City's proposed project (Alternative 1B) is the most cost-effective system and is within the required cost range to receive innovative/alternative technology funding (if available) from EPA.

### 1.5 EPA'S PROPOSED ACTION

EPA encourages the use of innovative/alternative technologies and the recovery of valuable resources. The City's proposed innovative project has been determined to be cost-effective and environmentally sound. Therefore, EPA proposes to give the City of Albuquerque a grant (up to 85%) for the construction of the City's proposed project. In addition, it is anticipated that the New Mexico Environmental Improvement Division will award to the City a 12.5% grant.

### 1.6 COORDINATION

EPA Region 6 has made a concerted effort to involve other Federal, State, and local agencies and the general public in the development of this SEIS. A public scoping meeting was held on 7 October 1980 in Albuquerque. Two Federal agencies (USDA/SCS and USDOE) agreed to be cooperating agencies. A public hearing to receive comments on the Draft Supplemental EIS was held on 18 November 1981. Many Citizens' Advisory Committee meetings were held throughout the project and on 9 December 1981, the Citizen's Advisory Committee voted on their final recommendation to the City concerning the sludge management system. Additionally, public information depositories were established and are being maintained in 6 convenient public buildings located throughout Albuquerque. Written comments on the draft Supplemental EIS were received from approximately 23 Federal and State agencies, local community organizations, public interest groups, and private citizens.

# **CHAPTER 2**

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# **CHAPTER 3**

## **DESCRIPTION OF ALTERNATIVES**

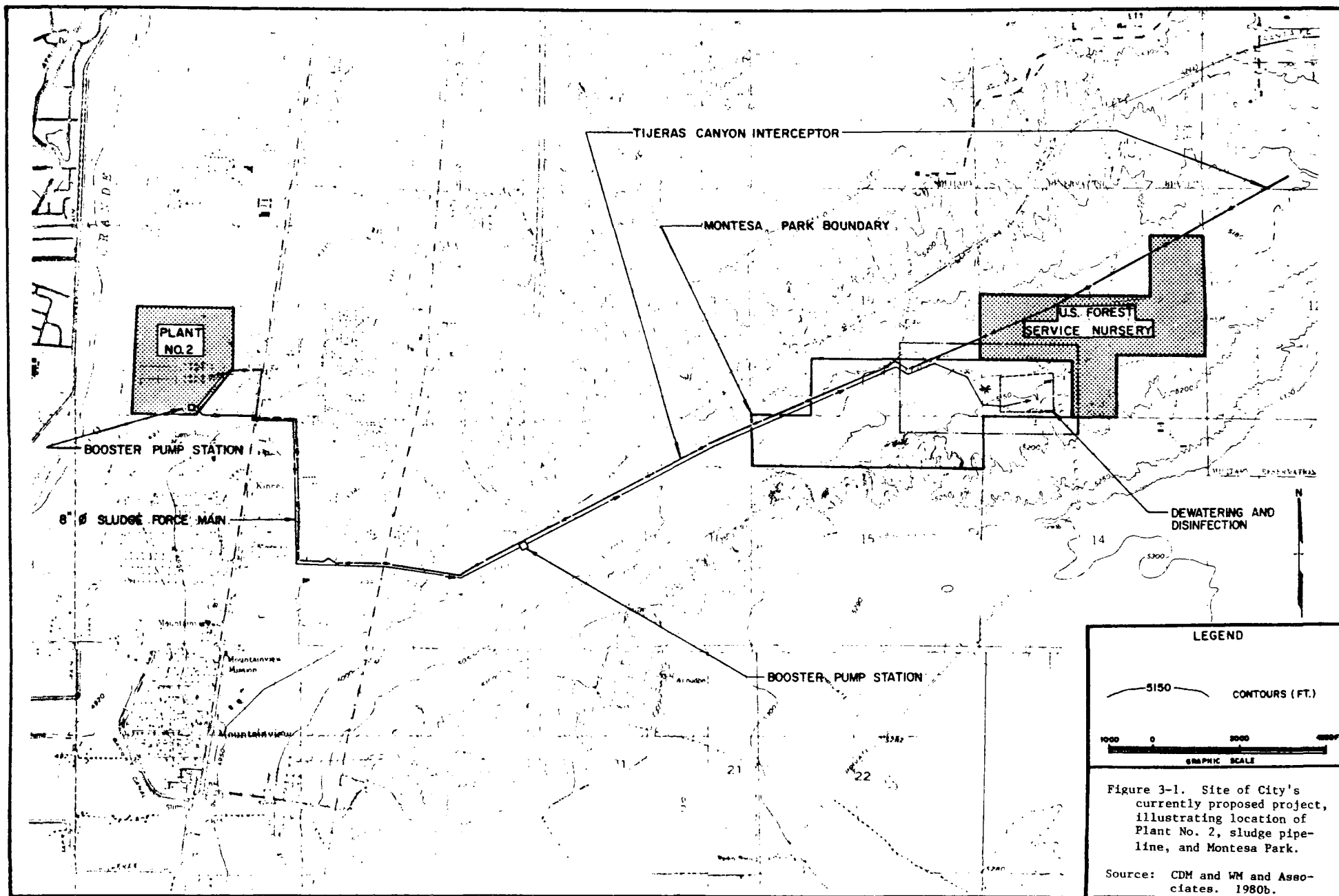
### 3.0 DESCRIPTION OF ALTERNATIVES

The Draft SEIS described and evaluated fourteen (14) optimal alternatives, including the City's proposed project (Alternative 1B). The evaluation included both an environmental impact assessment and a cost-effectiveness analysis. Subsequent to issuance of the Draft SEIS, the City made substantial changes to their proposed project as a result of input from the CAC, the general public, and the SEIS process. In addition, another process for conditioning and disinfecting sludge (the Zimpro thermal conditioning process) was evaluated subsequent to issuance of the Draft SEIS. This chapter presents a description of the City's currently proposed project (including the revisions made since issuance of the Draft SEIS) and a description of the environmental consequences of the City's currently proposed project; a summary of other alternatives and their environmental consequences; and a new cost-effectiveness analysis which incorporates changes in estimated costs developed by the City for their currently proposed project.

#### 3.1 DESCRIPTION OF APPLICANT'S PROPOSED PROJECT, INCLUDING REVISIONS MADE SINCE ISSUANCE OF THE DRAFT SEIS

The City's currently proposed project is composed of treatment processes to achieve the following: sludge thickening, stabilization, transportation of sludge to Montesa Park, conditioning, dewatering, drying, disinfection, temporary storage, and ultimate disposal by land application. Figure 3-1 illustrates the location of Plant No. 2, the proposed sludge pipeline and Montesa Park. A detailed site layout of the proposed sludge processing facilities at Montesa Park is shown in Figure 3-2.

Sludge thickening will be accomplished by constructing two new 300 sf (each) high rate type dissolved air flotation (DAF) thickening tanks, to be located adjacent to three identical DAF units currently being utilized at Plant No. 2. Each of the new units will have a 300 sf flotation zone, and will be rated for a solids loading of 2.0 lbs. dry solids per sq ft per hour when fed with sludge having a solids content varying between 0.5% and 1.5%. The new units will be designed to achieve 95% solids capture, producing a sludge thickened to approximately 4.0% solids. The new units will make maximum use of chemical feed, pumping, piping, and control systems, currently



# PROPOSED MONTESA PARK SLUDGE PROCESSING FACILITY

MONTESA PARK  
BOUNDARY

FOREST SERVICE  
TREE NURSERY

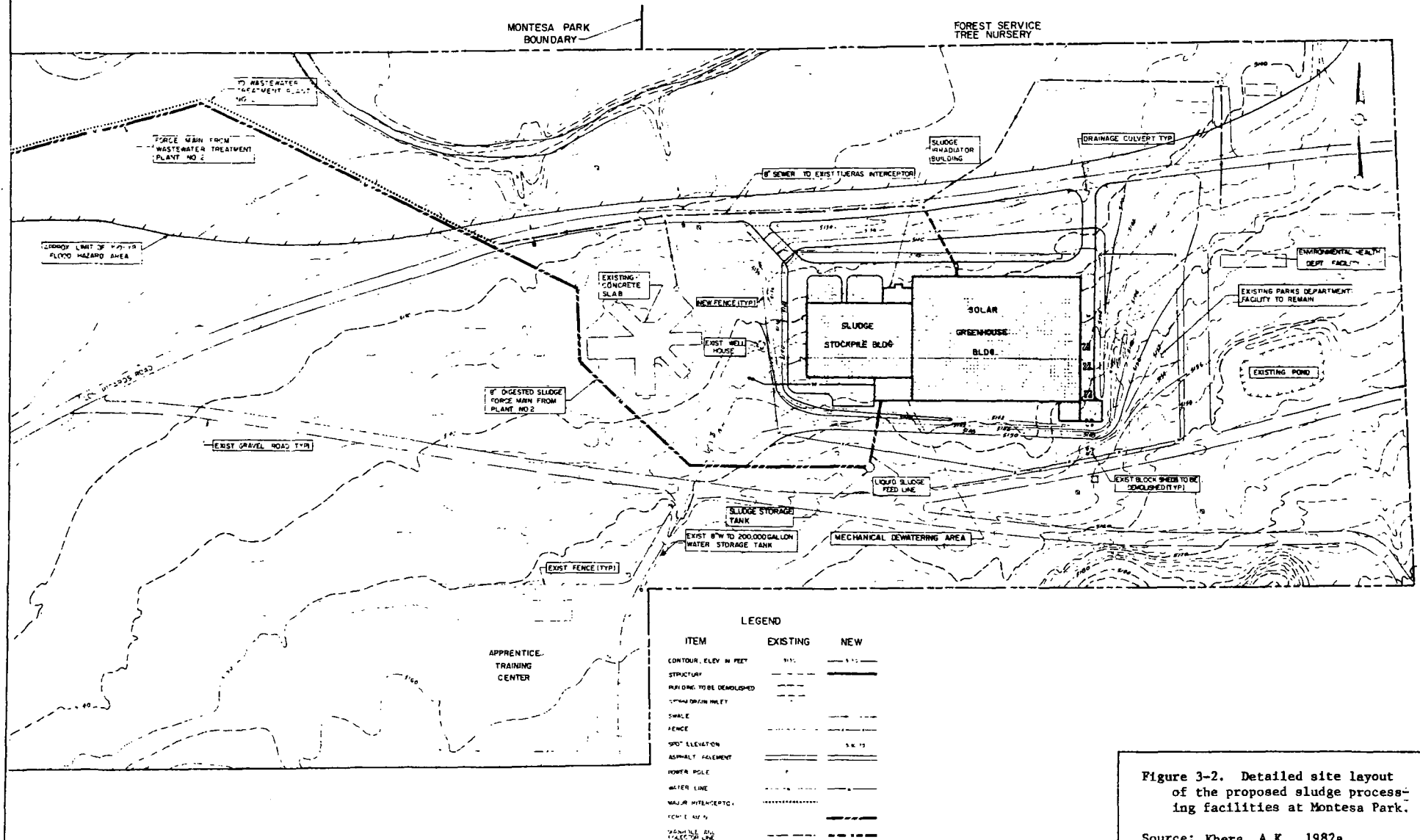


Figure 3-2. Detailed site layout of the proposed sludge processing facilities at Montesa Park.

Source: Khara, A.K. 1982a.

used for the three existing DAF units. The construction of two new DAF units also will involve an addition to the DAF building structure at Plant No. 2.

Sludge stabilization will be accomplished by constructing four additional anaerobic digestors similar to those currently utilized at Plant No. 2. The new stabilization system will consist of three new primary digesters and one secondary digester, each 120,000 cf in volume. The primary digesters will be heated and mixed using diffuser-type gas mixing systems. Gas will be collected from the new digesters, combined with gas from the existing units, and compressed and stored in new spheres to be constructed at Plant No. 2. The compressed digester gas will be utilized to fuel electrical generators that will provide electrical power for plant use.

Sludge removed from the digesters will be transferred in wet form to Montesa Park for further processing. The wet sludge transfer facilities for the proposed project consist of an 8-inch PVC pipeline approximately 26,000 feet long. The pipeline will start from a pump station located in the digester complex at the plant, and incorporate an intermediate booster pump station located just east of Interstate 25 (Figure 3-1). Sludge from this pipeline will discharge into a covered circular sludge holding tank at Montesa Park located adjacent to a proposed belt filter press building. The pipeline will have frequent cleanout fittings and will be equipped to permit a swab to be passed through the line. In addition, the pipeline will be arranged to facilitate flushing of the line from either end with wastewater effluent or water. The pump stations will each contain two centrifugal service pumps, with a single positive displacement stand-by pump for backup.

Sludge conditioning and dewatering will be accomplished by adding polymer to the sludge, followed by mechanical dewatering (via belt filter presses) to approximately 25% solids. The required equipment will involve a one-story building of about 5,500 square feet, containing four belt filter presses, with provision for future equipment. Included in the facilities will be a washwater reclamation system. Facilities for bulk storage of the polymer and other chemicals used in the building also will be included. Resulting sidestream from the washwater reclamation system as well as all other process and sanitary wastewater from the dewatering complex will be



pipd directly to the existing 8 inch sewer on Los Picaros Road bordering the property, thence flowing by gravity through the Tijeras interceptor to the headworks of Plant No. 2.

Sludge drying of the 25% solid belt press cake will be accomplished by using innovative solar greenhouse technology (Figure 3-3). Through a system of belt conveyors and front-end loaders, the belt press cake will be conveyed immediately to the 5-bay solar greenhouse drying facility. Each of the bays will be approximately 365 x 60 feet in plan, containing drying beds floored and walled with concrete, on which the sludge will be placed until reaching approximately 40% solids. The greenhouses will be of the pattern typically used in nurseries and garden shops; the southerly portion of roof and walls will be glazed, with all northerly surfaces being solid wall or roof material. The greenhouses are expected to have a maximum roof height of 20 feet. Air exhausted to the atmosphere from the greenhouse will pass through an odor scrubbing system, probably of the ozone type. Dry cake from the greenhouses will be passed via conveyors through a shredder into the feed hopper supplying the disinfection facility, or to intermediate storage located within the enclosed facilities.

Disinfection of sludge will be accomplished using Cesium-137, a nuclear waste by-product, to irradiate the sludge and render it virtually sterile. The proposed irradiator will involve a Cesium-137 source plaque (approximately 15 MCi) located in a concrete structure below the ground surface (Figure 3-4). The Cesium-137 will remain stationary while sludge is passed through the irradiator. The Department of Energy (DOE) will be responsible for supplying the Cesium-137, delivering it to Montesa Park, installing the Cesium-137 in the irradiator, replenishing the Cesium-137 periodically to maintain the required dosage, and subsequently removing and disposing the spent Cesium-137 at the end of the project life. Since the DOE will retain ownership of the Cesium-137 throughout the project period, the DOE also will be responsible for any cleanup and decontamination operations necessary due to occurrence of an unforeseen accident. Following irradiation, the irradiator output conveyor will discharge directly to a truck, via which sludge will be moved immediately into finished sludge stockpiles.

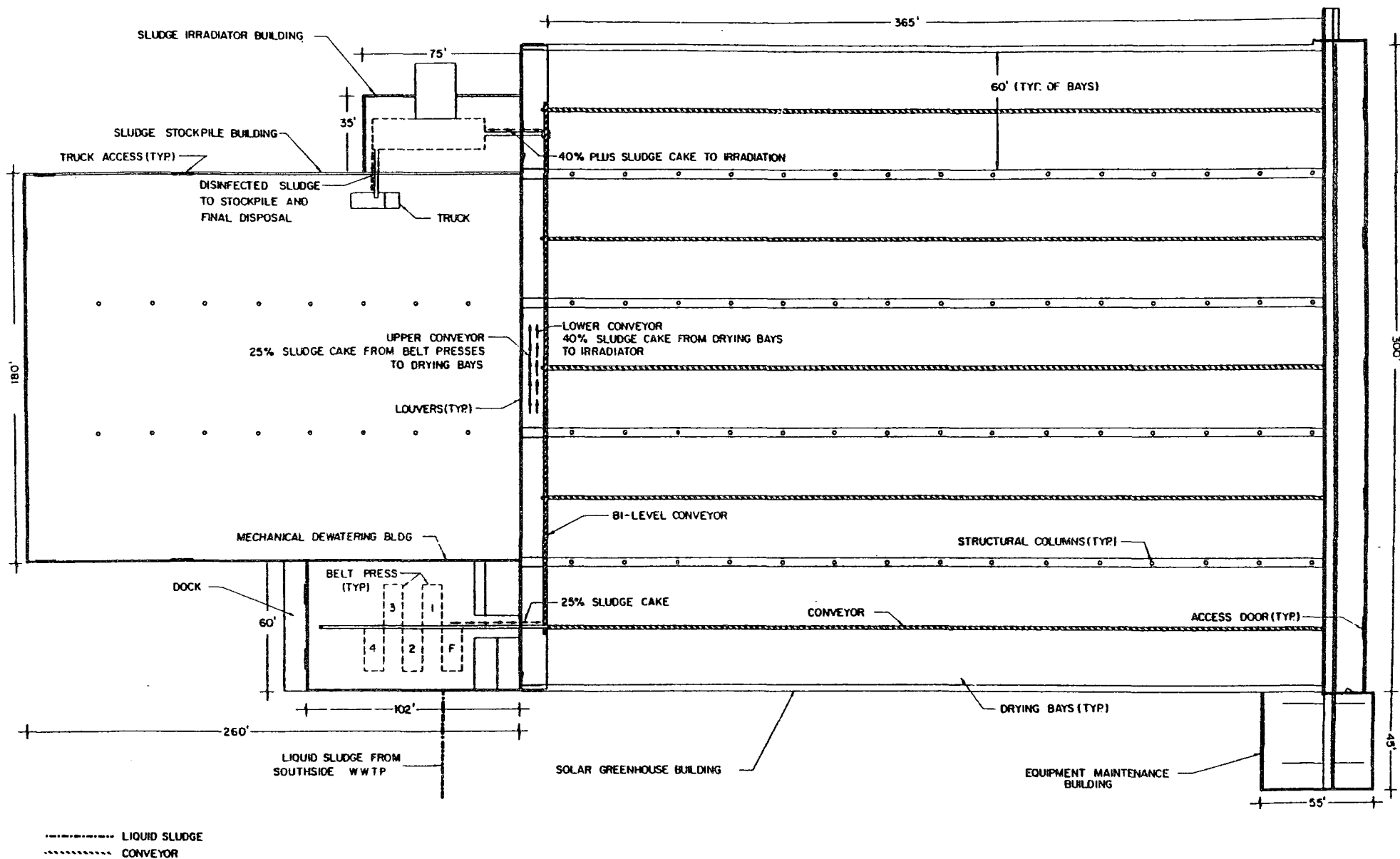
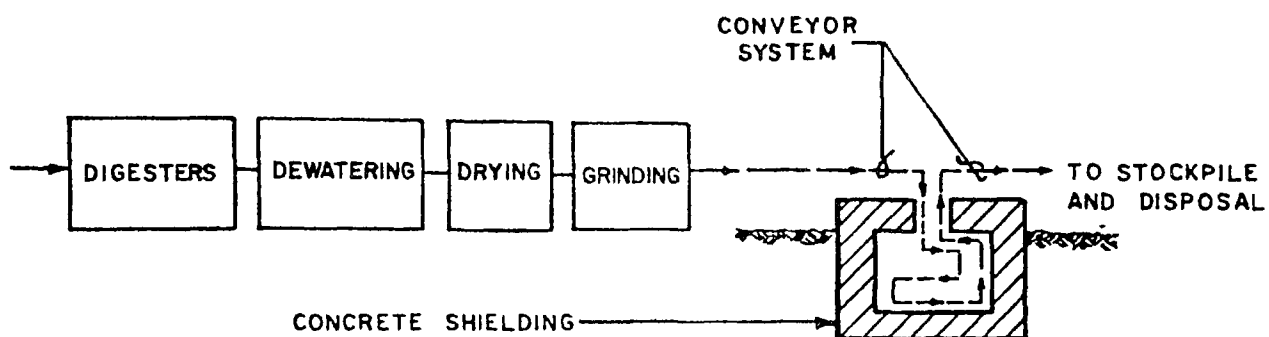
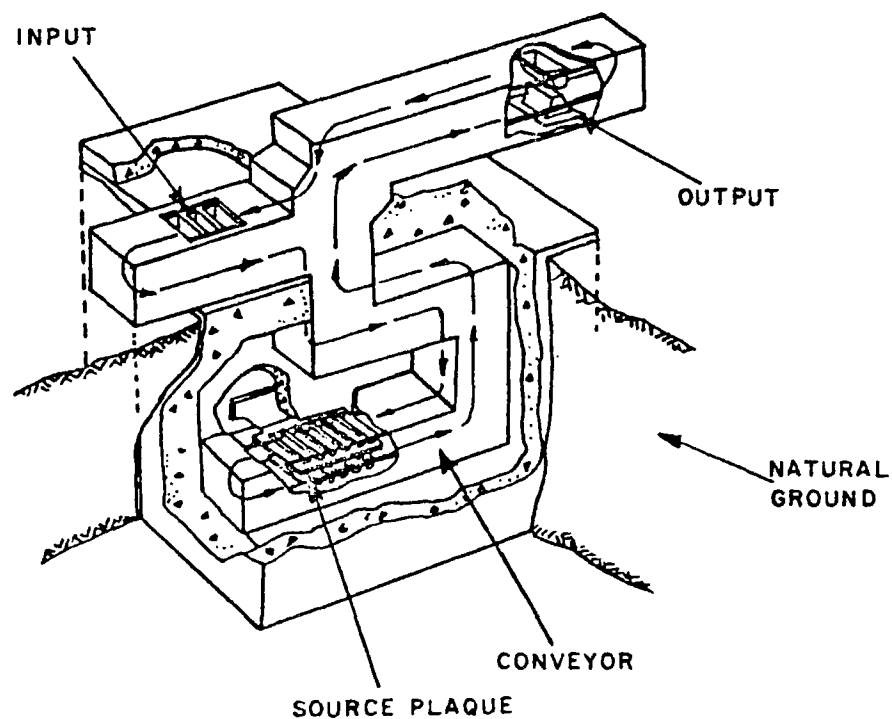


Figure 3-3. Schematic plan of Montesa Park sludge processing facilities.  
Source: CH2M HILL. 1982.



PROCESS FLOW SCHEMATIC  
NOT TO SCALE



IRRADIATOR SCHEMATIC ISOMETRIC  
NOT TO SCALE

Figure 3-4. Schematic of a Cesium-137 irradiator similar to that proposed for utilization by the City of Albuquerque.

Source: CDM 1980b.

Temporary storage of sludge prior to ultimate disposal on City parks and other public lands will be accomplished by using covered stockpiles located at Montesa Park. The stockpiles will be covered by a prefabricated metal building approximately 180 x 260 feet. The facility will consist of complete roofing and side enclosures, liberally fitted with screened ventilation openings at the base of the peripheral walls and at the roof peak. It is envisioned that the covered stockpile structure will consist of three frame or truss type roof support systems, each approximately 70 feet in clear span containing 10 bays, each 25 feet long, with a 12 foot eave height. The covered structure will have asphalt paving for interior flooring, sloped to drains connected to the sanitary sewer such that any leachate from the stockpile will be conveyed back to the plant through the Tijeras interceptor. The height of the sludge stockpile within this structure will average approximately 7 feet. Approximately 25% of the enclosed floor area will be devoted to roadways for loading and hauling vehicles. The structure will have the capacity to store the entire design output of sludge for six months, although in normal operation detention in the stockpiles prior to movement to the parks for application will average closer to 4 months.

Other improvements at the Montesa Park site will consist of security fencing, exterior lighting, drainage improvements, improvement to existing on-site roadways, landscaping, and staff amenities. Absolute positive and fail-safe capturing of all potential leachate or runoff which could in any way possible be contaminated with potentially harmful materials, will be a principal design criterion. Positive odor scrubbing equipment will be provided for all air exhausted to the atmosphere from the wet sludge processing facility.

Ultimate disposal of sludge will involve loading sludge from temporary stockpiles onto trucks, hauling it to a final disposal area, and spreading the sludge on top of the ground as a soil conditioner. Areas where sludge potentially will be placed are identified in Table 3-1. By design year 1990, 10,740 tons of sludge per year potentially will be utilized as a soil conditioner on lands in and around Albuquerque, New Mexico. The City also is investigating the feasibility of marketing sludge (either wholesale or retail) as a commercial soil conditioner (see Appendix F). As much as 40%

Table 3-1. Potential disposal of sludge on public lands in the vicinity of  
of Albuquerque, New Mexico.

<u>Potential User</u>	<u>Land Available In 1990 (acres)</u>	<u>Sludge Application (Tons/Year)</u>
City Parks	840	3,360
City Golf Courses	450	1,800
Bernalillo County Parks	260	1,040
UNM Golf Courses	330	1,320
UNM Miscellaneous Areas	150	600
Valley Gold Dairy	Not Defined	1,820 <sup>1</sup>
US Forest Service Nursery	200	<u>800</u>
	TOTAL	10,740

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<sup>1</sup>May utilize up to 3,600 tons of sludge per year, if available.

Source: Adapted from Camp Dresser and McKee, Inc., and William Matotan & Associates, Inc. 1980b. City of Albuquerque, New Mexico southside wastewater treatment plant phase II expansion program engineering report. Prepared for City of Albuquerque, New Mexico Water Resources Department. Albuquerque NM, variously paged.

(approximately 4300 tons per year) of the total design year sludge production may be disposed via commercial sale in lieu of disposal on public lands.

The City's currently proposed project differs in several aspects from the City's originally proposed project (Alternative 1B) that was evaluated in the Draft SEIS. Partially in response to comments from the CAC, the general public, and the SEIS process in general, the City has added numerous provisions for mitigating adverse environmental consequences associated with the original project. Mitigative measures which will be implemented by the City as part of the currently proposed project are listed in Table 3-2.

To implement the proposed project, several steps must be completed. The City's major sludge management planning effort was described in the Southside Wastewater Treatment Plant Phase II Expansion Program Engineering Report dated December 1980, which is commonly referred to as the Balloon Report. In January 1981, the City submitted the Balloon Report to EPA as a draft Facilities Plan Amendment. Upon completion of the public comment period associated with this final SEIS, the City must undertake the following steps prior to initiation of engineering design efforts:

- The Balloon Report must be amended to incorporate changes made in the City's proposed project as a result of the SEIS process.
- The Balloon Report must be adopted by the City Council as an amendment of the City/County Comprehensive Plan's Wastewater Facilities Plan element.
- The Balloon Report also must be adopted by other local governments in the planning area associated with the City/County Comprehensive Plan.

The City of Albuquerque will maintain an EIS and SEIS Record documenting compliance with these stipulations. All required approvals and adoptions of the proposed plan will be obtained prior to initiation of engineering design of the proposed project.

### 3.2 ENVIRONMENTAL CONSEQUENCES OF THE PROPOSED PROJECT

#### 3.2.1 Direct and Indirect Consequences

The City's currently proposed project has been analyzed to determine primary and secondary impacts and the short-term or long-term nature of the

Table 3-2 Mitigative measures incorporated into the City's currently proposed project.

- Sludge holding tanks at Montesa Park will be covered.
- Washwater reclamation tanks at Montesa Park will be covered.
- Sludge dewatering facilities (belt presses) will be enclosed, and air exhausted from the facilities will be scrubbed to remove odor.
- The proposed solar greenhouse height has been reduced from 60 ft to 20 ft maximum.
- Air exhausted from the solar greenhouse facility will be scrubbed to remove odor.
- All stockpiles will have asphalt paving, sloped to collection drains to prevent leachate from reaching open ground.
- All stockpiles will be enclosed and covered in prefabricated metal buildings.
- The Montesa Park site will be provided with security fencing, lighting, and drainage improvements.
- Provision will be made for absolute, fail-safe collection and treatment of leachate and contaminated storm water runoff (if any) to prevent surface and/or groundwater contamination.
- Liberal usage of landscaping and provision of staff amenities will be utilized to make the proposed facilities pleasing to outside observers as well as to the operational staff.

impacts. Impacts are discussed in the paragraphs below for each environmental parameter or category with both beneficial and adverse effects considered. Additional impacts that must be considered pursuant to CEQ guidelines, such as irreversible and irretrievable commitments of resources and the relationship of the project to long-term productivity, are discussed separately in this section.

- Earth Resources

The proposed sludge management system site is located on the East Mesa in an Arroyo known as Tijeras Arroyo. The East Mesa is a broad alluvial expanse at the base of Sandia Mountain. The proposed site (Montesa Park) is flat, thus no adverse environmental impact on topography is anticipated. Plant No. 2 is located in the floodplain of the Rio Grande River. No adverse impact on geology or topography is expected from expansion of the sludge management system at Plant No. 2, as this expansion will be confined to the boundaries of City property at the existing plant site. The vertical alignment of the City's proposed sludge pipeline will increase gradually from about 4,930 ft msl at Plant No. 2 to 5,150 ft msl at Montesa Park. Since this alignment follows the existing topography of Tijeras Arroyo, no adverse impact to topography will occur as a result of pipeline construction.

Soils at the proposed project site (Montesa Park and Plant No. 2) consists of loamy fine sands. These soils have a high permeability, and their depth from the surface varies from 0-60 inches. These soils may be susceptible to erosion during construction activities as indicated by their moderately high soil erodibility (K) factor. However, sediment derived from this erosion is not expected to contribute significantly to water quality problems as a result of increased turbidity. The depth of excavation for construction of the sludge pipeline will be limited by the soils within the Tijeras Arroyo, because the cut-banks (i.e., sides of the trench) will tend to cave in severely at moderate trench depths. However, this will not be a significant problem since the proposed force main, unlike a gravity sewer, can be constructed close to the ground surface. The pipeline construction will not alter the soils of the Arroyo.



A beneficial effect is expected on soils at the land application sites (i.e., in City parks and other public land). The digested sludge applied to these sandy soils will increase field moisture capacity, non-capillary porosity, cation-ion exchange, and will replace valuable soil nutrients and trace metals.

- Surface Water Resources

Direct impacts to stream flow associated with the proposed construction activities in or near the Tijeras Arroyo and the Middle Rio Grande River will be minor, temporary, and of no significant consequence. The largest secondary hydraulic impact of the proposed action will be augmentation of the base flow of the Middle Rio Grande River. Sewage effluent discharged from Plant No. 2 will increase from a current average of 39.0 mgd to approximately 60 mgd. This increase will consist of water taken mainly from groundwater reserves rather than from upstream surface water sources. The result will be that the base flow of the Rio Grande River, below the outfall of Plant No. 2, will increase approximately 39.8 cfs.

One of the principal reasons for implementing the proposed action is to improve the sludge management capability of the City of Albuquerque and consequently to enhance the water quality of the Middle Rio Grande River. Such enhancement will be both direct (e.g., reducing pollutant loads by better sludge management practice) and indirect (e.g., by providing a large base flow to buffer non-point source pollution). Construction activities for improvements at Plant No. 2, the new sludge management components at Montesa Park, and the pipeline construction have a potential for degrading water quality due to suspended and bedload solids (i.e., siltation) from erosion of disturbed material. This siltation is expected to be temporary (short term) and of minor consequence.

- Groundwater Resources

The greatest potential for groundwater quality degradation is due to accidental breaks in the five mile long sludge pipeline that will lead from Plant No. 2 to Montesa Park. However, accidental breaks and leakage and subsequent groundwater quality reduction should be minimized through the use of good engineering design practices.

- Air and Sound Quality

Of the five criteria air pollutants regulated by EPA, only total suspended particulates (TSP) is of any significance to the proposed project. Small amounts of other pollutants will be emitted during construction, but their impact on existing ambient air quality will be negligible. Fugitive dust emissions resulting from construction activities, particularly at Montesa Park, will cause a short-term local increase in TSP levels. Persons sensitive (i.e., allergic) to dust that live in close proximity to the construction site may be temporarily affected by these fugitive dust emissions.

Electrical equipment primarily will be used to operate the sludge management facilities and therefore will not create on-site sources of additional air pollutants. Secondary air quality impacts will occur due to growth related aspects of the proposed action.

Odor impacts due to the proposed action can be summarized as follows: (1) the abandoning of Plant No. 1 will have a significant benefit to the large population surrounding it; and (2) elimination of the sludge drying beds at Plant No. 2 and construction of new sludge management components at Montesa Park will result in a benefit to the population surrounding Plant No. 2. Mechanical dewatering, stockpiling, and the solar greenhouse are the most probable sources of odors at Montesa Park. However, the production of odors at Montesa Park will be minimized by the use of enclosed structures and by odor scrubbing equipment, as mandated by court stipulations. Impacts will vary seasonally and daily according to plant operating characteristics and prevailing weather conditions.

Noise associated with construction and operation of the sludge management facilities will generate both short-term and long-term effects. Short-term noise will be caused by activity of construction equipment at Plant No. 2, along the pipeline route and at Montesa Park. Construction of a pipeline will require equipment that is standard in earth-working and utility industries. A right-of-way will be cleared with bulldozers, and debris will be removed with front-loaders and dump trucks. A ditch-digger or backhoe will follow. The pipe laying activity will require moderately heavy trucks and

other equipment. Operation of certain equipment will be a source of concern at short distances (e.g., backhoes and concrete mixers). The actual sound level at the construction site will depend on equipment, duty cycle, and the number and mixture of equipment types that are operating simultaneously. Sensitive receptors (e.g., residences) located along the pipeline route will be affected by construction noise. This noise will be short-term in nature, and if conducted during the day, should not significantly affect the residences.

Noise caused by operations at Treatment Plant No. 2 will be dominated by components associated with air compressors and large electric motors. Use of enclosed facilities at Plant No. 2 will minimize noise levels, thus long-term operational effects to local residents will be minor.

Montesa Park currently is zoned SU-1 (special use zoning). There are no sensitive receptors currently located near the park that will be affected by noise level increases due to the operation of the proposed sludge management facilities. The enclosure of all major equipment will keep noise increases at the minimum possible level.

- Biological Resources

Short-term direct effects on terrestrial and aquatic biota in the proposed project area will occur due to construction at Montesa Park, the pump station sites, and along the pipeline route. Construction of facilities at Montesa Park will result in the disturbance of several natural plant communities. Typical vegetation species on this shrubland site include sagebrush, creosote bush, tumbleweed, and various xeric grass species. Animals (black-tailed jackrabbit, coyote, Redtailed Hawk, and American Kestrel) that utilize these areas for feeding will leave temporarily because of construction noise and increases in human activity. These species most likely will return after construction. The temporary disturbance to plant and animal species due to construction of the proposed project will not significantly affect the biological resources of the project area.

No rare/endangered terrestrial plant or animal species or habitat critical for such species are currently known to occur at Montesa Park or along the proposed pipeline route. Therefore, no effects to rare and endangered species will occur.

- Cultural Resources

Montesa Park and the proposed Tijeras Arroyo pipeline route were surveyed, and no surficial evidence of cultural resources was found in either of these areas; however the possibility of encountering buried sites during construction was noted (Banks 1981). In order to protect cultural resources, EPA will condition any future grant to require that, if cultural resources potentially eligible for listing in the National Register of Historic Places are encountered during construction, the SHPO, EPA, and the Department of Interior will be notified and the Advisory Council on Historic Preservation (ACHP) offered an opportunity to comment in accordance with 36 CFR 800.

- Population

No relocation of population is anticipated due to implementation of the proposed project since the sludge management facilities will be built primarily on vacant City-owned land. Additionally, none of the land utilized as a buffer zone has occupied dwelling units. Construction and operation of the proposed action will not cause a population growth but will facilitate those increases currently projected by various planning agencies.

- Land Use and Transportation

Land use at Plant No. 2 or Montesa Park will not change since construction will be accomplished within existing City property boundaries. Prior to initiation of engineering design, the City/County Comprehensive Plan which designates Montesa Park as "open space" must be amended to include the proposed use of Montesa Park for sludge management facilities. In addition, Montesa Park currently is zoned Special Use 1 (SU-1). Site development plans for the proposed project must be approved by the City Environmental Planning

Commission as a condition of Montesa Park's SU-1 zoning. Land use along the proposed pipeline route will be affected temporarily during construction of the pipeline. However, no permanent change will result and the period of pipe laying at any one site will be short.

As an indirect consequence of the proposed action, operations at Treatment Plant No. 1 will cease. This land will remain as City property, perhaps to be utilized for other City purposes. As a direct result of this action, land values in the neighborhood may increase since the area near Plant Site No. 1 will tend to be a more pleasant area in which to live.

Current transportation networks and utility services will not be significantly affected by the proposed project. No additional transportation facilities will be required beyond those currently being planned.

- Economic Resources

Direct economic effects will result from (1) the increase in local purchasing by construction and operation work forces, and (2) the sale of materials for construction and operation of the proposed operation. Wages and salaries paid to construction laborers will not significantly alter local wage rates. The cost of materials will be approximately 6-7 million dollars. Much of the material will be purchased locally.

It is anticipated that Federal and State funds will be granted to the City which will have a beneficial effect on the area since much of the money will be spent locally. Indirect beneficial effects will accrue as the money circulates. It is also anticipated that implementation of the City's proposed project will cost additional money per connection (i.e., per family paying a monthly sewer bill). The exact cost cannot be determined until the project is financed and built. The cost should not represent a significant economic burden as defined by PRM 79-8 (EPA 1979h). Therefore, the City's proposed project will not result in any unavoidable adverse economic impacts.

- Energy Resources

No direct effect of the proposed action on energy resources is anticipated. Electricity to meet the sludge management facilities operation demands will be available as the Public Service Company of New Mexico is currently capable of generating 20% above peak demand. The proposed action will consume approximately 2.24 million kw-hr. per year. This demand represents approximately less than 0.2% of available reserve above peak (by phone, Alex Gonzales, Public Service Company of New Mexico, 16 July 1981). In addition, the expansion of Treatment Plant No. 2 will allow for on-site generation of electricity (using digester gas) that potentially will meet or exceed the plant's electrical demand for sludge processing.

- Environmental Health

No large scale direct or indirect environmental health effects are anticipated to occur to persons in the project area or within the City of Albuquerque. The DAF thickeners and the anaerobic digesters at Plant No. 2 will have a beneficial effect due to the reduction or elimination of harmful organisms in the sludge. Construction activities at Plant No. 2, along the pipeline route, and at Montesa Park will generate fugitive dust that may temporarily bother persons in the immediate vicinity that are sensitive to dust due to allergies or other medical afflictions. Pathogenic aerosols and other disease transmitting organisms are not anticipated to be significant at Montesa Park since all facilities will be enclosed and exhaust air scrubbed to remove odors and potentially some other particulates. Stockpiles will not contaminate groundwater supplies because they will be built on impervious paving with all leachate collected and treated.

The Cesium-137 irradiator will be designed so that, during normal operation, radiation exposure within 3 to 10 ft of the facility will not be detectable above background levels. Material irradiated will not be radioactive or exhibit any properties of radioactive material, thus the general populace will be safe during normal operation. The full-time operators of the irradiation facility potentially will be exposed to additional whole body gamma radiation of 0.05 rem/year. Based on current risk estimating techniques, this exposure potentially will cause the operators to have a lifetime

risk of premature death from radiogenic cancer of 0.05% above normal. There potentially will be an approximately equal risk of the operators developing a non-fatal radiogenic cancer (May 1981). Possible effects due to accidents at the irradiator were thoroughly described in Appendix 10.2 of the Draft SEIS.

- Recreation and Aesthetics

No long-term effects upon recreation or aesthetics are anticipated due to the operation of the proposed project. During construction, noise, fugitive dust, and truck traffic may mildly affect activities at the Albuquerque Raceway, the New Mexico Timing Association Drag Strip, and the University of New Mexico Golf Course. Localized hunting, hanggliding, target shooting, and motorcycle and off-road vehicle activities in the Tijeras Arroyo also may temporarily be affected.

### 3.2.2 Unavoidable Adverse Impacts of the City's Currently Proposed Project

The City's currently proposed project will cause some adverse environmental impacts which cannot be avoided if the proposed project is implemented. These unavoidable adverse impacts are summarized below. Mitigative measures (if any) available to reduce the magnitude of the impacts also are discussed.

- Surface Water Resources

An unavoidable adverse impact on stream water quality involves erosion and a subsequent increase in suspended sediment associated with construction of the sludge facilities at Montesa Park and along the pipeline route. The principal adverse effect of this siltation consists more of temporary aesthetic degradation than of habitat degradation in the receiving streams. Generally such siltation can be readily minimized. The erosion and sedimentation control plan required by the State of New Mexico for such facilities should provide for effective sediment control through such measures as: (1) minimizing construction in and adjacent to streams by environmentally sound pipeline alignment; (2) avoiding steep slopes; (3) removing excess material; (4) continuous backfilling of trenches; (5) diverting runoff away from undisturbed areas; and (6) using detention or retention basins in critical areas.

- Groundwater Resources

There are no long-term unavoidable adverse impacts anticipated to occur to the groundwater system due to implementation of the City's proposed project. The primary impact of the proposed project is potential local groundwater quality degradation due to accidental breakage of the new sludge pipeline. The best mitigative measures for this potential problem is preventive maintenance and assuring that all facilities are leak-proof via proper engineering design and construction.

- Air and Sound Quality

The only adverse air quality impact that will occur due to implementation of the City's proposed project will be that caused by fugitive dust generated by construction activities at Montesa Park and along the pipeline route. To minimize dust generation, frequent watering will be employed. Dust generation also may be reduced by restricting the speed of haul trucks traveling over unpaved roads to the construction site.

Sludge handling and processing facilities at all times have been odor sources, especially in summer conditions, and it is doubtful whether such odors can ever be completely eliminated. However, if the sludge handling and processing facilities are properly operated, adverse odor problems should be minimal.

The Montesa Park site is located away from developed communities, thus the number of people that potentially will be affected is minimal. Mitigative measures, such as gas scrubbers for the solar greenhouse air exhaust system and the covering of stockpiles with a prefabricated metal building have been incorporated into the proposed project to control odor.

The major adverse impact of noise due to the City's proposed project will be temporary and will occur during construction. The degree of effect will depend heavily upon population density and proximity of human habitation to noise sources. The impact of noise from construction activity and equipment will be mitigated by proper maintenance of operating equipment and installation of noise-attenuating devices. Dozers and backhoes will be major noise



sources, and modern exhaust muffling equipment will be used to significantly reduce noise emanated from these pieces of construction equipment.

- Biological Resources

The only short-term adverse impact that will occur as a result of implementing the proposed action will be the disturbance of terrestrial flora and fauna in areas of construction. These disturbances will be temporary and will be mitigated by careful choice of access roads to construction sites, muffling of engine noise, and use of the narrowest practical construction easement along the sludge pipeline route.

- Environmental Health

Unavoidable adverse consequences to environmental health that will occur due to implementation of the City's currently proposed project include: (1) fugitive dust will be generated during construction that may bother persons sensitive to dust; and (2) full-time operators of the irradiator will increase their lifetime risk of premature death from radiogenic cancer by 0.05% above normal.

### 3.2.3 Irretrievable and Irreversible Resource Commitments

Implementation of the City's currently proposed project will require irretrievable and irreversible commitments of natural and man-made resources. These resource commitments include:

- Fossil fuel, electrical energy and human labor for construction and operation of the proposed facilities will be expended.
- Chemicals (especially polymer) for dewatering and thickening of sludge will be expended.
- Tax dollars for construction of the proposed sludge management facilities will be expended and thus will not be available for use in other government financed projects.
- Land devoted as the project site will be lost for other uses.

#### 3.2.4 Relationship Between Short-term Uses of Man's Environment and Maintenance and Enhancement of Long-Term Productivity

The short-term disruption and commitment of resources associated with construction and operation of the City of Albuquerque's proposed sludge management system will be necessary to improve area aesthetics and water pollution problems. The anticipated short-term environmental impacts and resource requirements associated with the City's proposed project will be offset by long-term water quality improvements and reductions in public annoyance.

### 3.3 DESCRIPTION OF ALTERNATIVES EVALUATED

This section briefly describes alternatives to the City's currently proposed project that were evaluated either prior to or subsequent to issuance of the Draft SEIS. This section also presents a summary evaluation of the environmental consequences of the alternatives evaluated.

#### 3.3.1 Alternatives Evaluated in the Draft SEIS

The no action alternative and fourteen action alternatives were evaluated in the Draft SEIS, consisting of the City's proposed project (Alternative 1B) and 13 alternative projects. Each of the action alternatives evaluated in the Draft SEIS is listed by component (i.e., treatment process) in Table 3-3. The components are listed in the order they occur (i.e., the dewatering process occurs before drying) with the exception of Alternatives 1G and 1H, in which the electron beam irradiation (disinfection) process actually occurs before the belt press (dewatering) process. The alternatives were categorized in three groups.

Group 1 alternatives involved the concept of disinfecting sludge and disposing it by landspreading on city parks and other public lands as a soil conditioner. Six of the group 1 alternatives used innovative technologies (i.e., solar greenhouse drying, Cesium-137 irradiation, or electron beam irradiation) and thus were potentially eligible for 10% additional Federal funding. For the Group 1 alternatives, sludge would be thickened and stabilized at Plant No. 2, and then transported to Montesa Park where the remainder of the sludge treatment processes would take place.

Table 3-3. Action alternatives evaluated in the Draft SEIS for the Albuquerque sludge management system.

<u>Group 1 - Landspread Concept</u> <sup>(1)</sup>									
<u>NO.</u>	<u>ALTERNATIVE</u>	<u>THICKENING</u>	<u>STABILIZATION</u>	<u>TRANSPORTATION</u>	<u>CONDITIONING</u>	<u>DEWATERING</u>	<u>DRYING</u>	<u>DISINFECTION</u>	<u>DISPOSAL</u> <sup>(2)</sup>
1	1A	Dissolved Air Flotation	Anaerobic Digestion	Truck to Montessa Park	Organic Polymer	Belt Press to 25%	Solar Greenhouse to 40%	Cesium-137 Irradiation	Landspread on City Parks and Golf Courses
2	1B	Dissolved Air Flotation	Anaerobic Digestion	Pipeline to Montessa Park	Organic Polymer	Belt Press to 25%	Solar Greenhouse to 40%	Cesium-137 Irradiation	Landspread on City Parks and Golf Courses
3	1C	Dissolved Air Flotation	Anaerobic Digestion	Truck to Montessa Park	Organic Polymer	Belt Press to 25%	Open Air Drying to 40%	Cesium-137 Irradiation	Landspread on City Parks and Golf Courses
4	1D	Dissolved Air Flotation	Anaerobic Digestion	Pipe to Montessa Park	Organic Polymer	Belt Press to 25%	Open Air Drying to 40%	Cesium-137 Irradiation	Landspread on City Parks and Golf Courses
5	1E	Dissolved Air Flotation	Anaerobic Digestion	Truck to Montessa Park	Organic Polymer	Belt Press to 20%	—	Composting	Landspread on City Parks and Golf Courses
6	1F	Dissolved Air Flotation	Anaerobic Digestion	Pipeline to Montessa Park	Organic Polymer	Belt Press to 20%	—	Composting	Landspread on City Parks and Golf Courses
7	1G	Dissolved Air Flotation	Anaerobic Digestion	Truck to Montessa Park	Organic Polymer	Belt Press to 25%	Open Air Drying to 40%	Electron Beam Irradiation	Landspread on City Parks and Golf Courses
8	1H	Dissolved Air Flotation	Anaerobic Digestion	Pipe to Montessa Park	Organic Polymer	Belt Press to 25%	Open Air Drying to 40%	Electron Beam Irradiation	Landspread on City Parks and Golf Courses

Table 3-3. Action alternatives evaluated in the Draft SEIS for the Albuquerque sludge management system (concluded).

<u>Group 2 - Landfill Concept</u>									
<u>NO.</u>	<u>ALTERNATIVE</u>	<u>THICKENING</u>	<u>STABILIZATION</u>	<u>CONDITIONING</u>	<u>DEWATERING</u>	<u>DRYING</u>	<u>DISINFECTION</u>	<u>TRANSPORTATION</u>	<u>DISPOSAL</u>
9	2A	Dissolved Air Flotation	Anaerobic Digestion	Polymer	Belt Press to 20%	—	—	Truck to Landfill	Landfill
10	2B	Dissolved Air Flotation	Anaerobic Digestion	Lime/Ferric Chloride	Pressure Filters to 35%	—	—	Truck to Landfill	Landfill
<u>Group 3 - Dedicated Land Disposal Concept</u>									
11	3A	Dissolved Air Flotation	Anaerobic Digestion	—	—	—	—	Truck to Pajarito	Dedicated Land Disposal
12	3B	Dissolved Air Flotation	Anaerobic Digestion	—	—	—	—	Pipeline to Pajarito	Dedicated Land Disposal
13	3C	Dissolved Air Flotation	Anaerobic Digestion	—	—	—	—	Pipeline to Rio Puerco	Dedicated Land Disposal
14	3D	Dissolved Air Flotation	Anaerobic Digestion	—	—	—	—	Truck to Rio Puerco	Dedicated Land Disposal

- Not Applicable  
 (1) Beneficial reuse of sludge.  
 (2) Disposal also will involve marketing (i.e., commercial sale) of upto 40% of the sludge produced.

Group 2 alternatives involved the concept of dewatering sludge and disposing it in a municipal landfill north of the City. All sludge treatment processes prior to disposal would take place at Plant No. 2.

Group 3 alternatives involved the concept of thickening and stabilizing sludge at Plant No. 2 and disposing it by dedicated land disposal at a site on the West Mesa. Two disposal sites were evaluated. The 14 alternatives and the treatment processes involved with each alternative are fully described in the Draft SEIS.

### 3.3.2 Alternatives Evaluated After Issuance of the Draft SEIS

The CAC requested that another alternative -- Zimpro Thermal Conditioning -- be fully evaluated as part of the SEIS process. The City of Albuquerque and EPA both conducted independent evaluations of the Zimpro thermal conditioning process. The evaluations were not completed in time to incorporate them into the Draft SEIS; however, copies of both evaluations have since been made available to the CAC and placed in local public information depositories. These evaluations are summarized in the following paragraphs.

Initially, the CAC requested that the wet air oxidation process be evaluated. As described in the Draft SEIS, wet air oxidation is a sludge treatment process that typically uses temperatures of 500°F and pressures of 1,800 psi to oxidize (i.e., to burn) sludge and thereby reduce the volume of organic matter by 80-90%. Maximum temperatures of 600°F at 3,000 psi have been used in some wet air oxidation systems. The Zimpro process which was of interest to the CAC (although referred to by some as a wet air oxidation system) is actually a low-temperature, low-pressure thermal conditioning system. The Zimpro process typically uses temperatures of 350°F at 400 psi to achieve a 5% reduction in organic matter in the sludge. The Zimpro system, however, does achieve two characteristics of interest to this project: (1) sludge is rendered disinfected by the Zimpro process; and (2) sludge is easily dewatered.

The City of Albuquerque conducted an evaluation of the Zimpro process at the request of the CAC and the City Council. The City's evaluation concluded:

- Thermal conditioning is not particularly well suited to anaerobically digested sludge.
- Exhaust gases are quite odorous and difficult to scrub, even with exhaust gas incinerators (which are not allowed by local ordinance).
- Sidestreams are difficult to treat, and may cause odor problems at the open primary clarifiers at Plant No. 2.
- Sidestream treatment will require additional aeration units at Plant No. 2.
- Thermal conditioning equipment such as boilers, heat exchangers, and high pressure pumps will require advanced operators and high maintenance costs.
- Thermal conditioning is not as cost-effective as other disinfection systems available for the Albuquerque project.

EPA also conducted an independent evaluation of the Zimpro process. EPA's evaluation concluded:

- Thermal conditioning will create unacceptable odors. Acceptable reduction in odor levels can only be achieved by exhaust gas incineration, which is not allowed by local ordinance.
- Thermal conditioning is not as cost-effective as other sludge management systems available for the Albuquerque project.

Upon completion of the above evaluations, EPA determined that it was not necessary to further evaluate Zimpro thermal conditioning as a viable alternative for the Albuquerque project.

### 3.3.3 Environmental Consequences of Alternatives

Environmental consequences of the 14 optimal alternatives were described and illustrated in matrix form in the Draft EIS. Following issuance of the Draft SEIS, the City of Albuquerque made several changes to their proposed project by incorporating mitigative measures where possible. A re-evaluation of environmental consequences made on this basis is summarized in Table 3-4.

Table 3-4. Summary of environmental consequences of 14 optimal alternatives.

<u>IMPACT CATEGORY</u>	<u>IMPACT</u>	<u>IMPACT TYPE &amp; DEGREE</u>	<u>IMPACT DESCRIPTION</u>
Earth Resources	Heavy metals and toxic elements in soil	Primary: Long-term	<u>Alternatives 1C, 1D, 1G, 1H:</u>  These alternatives use open air drying which could be a potential source of sludge leachate and/or surface runoff that could contaminate soil in and near Montesa Park.
	Erosion and loss of soil productivity	Primary: Long-term	<u>Alternatives 3A, 3B, 3C, 3D:</u>  Method of disposal (DLD) in these alternatives will result in severe dust problem and loss of soil productivity. Also water erosion and erosion due to wind are of potential concern.
	Temporary erosion	Primary: Short-term	<u>Alternatives 1B, 1D, 1F, 1H:</u>  Temporary sloughing of cut-back slopes may cause minor erosion during pipeline construction.
	Temporary surface disturbance	Primary: Short-term	<u>All Alternatives:</u>  Construction will cause temporary disturbances of surficial soils.
Surface Water Resources	Non-Point source runoff	Primary: Short-term	<u>Alternatives 1B, 1D, 1F, 1H, 3B, 3C:</u>  A temporary increase in turbidity due to siltation from erosion will occur as a result of pipeline construction.  <u>All Alternatives:</u>  Construction-related impacts will be minimal.
	Floodplain	Primary: Short-term	<u>All Alternatives:</u>  Impacts on flood hazard areas are expected to be minimal.
	Water quality	Primary: Long-term	<u>Alternatives 3A, 3B, 3C, 3D:</u>  Sedimentation and toxic runoff from DLD systems may affect water quality in local streams.
Groundwater	Groundwater quality	Primary: Long-term	<u>Alternatives 1C, 1D, 1F, 1G, 1H, 3A, 3B, 3C, 3D:</u>  The potential for nitrate contamination exists in these alternatives. Even though the groundwater level underneath Montesa Park is deep, contaminated surface runoff from open air drying may proceed down Tijeras Arroyo into areas where groundwater is shallow enough to be contaminated by vertical seepage. Contamination due to pipeline breaks or improper operation of DLD activities also is possible.
Air and Sound Quality	Odor	Primary: Long-term	<u>Alternatives 1C, 1D, 1G, 1H:</u>  Open air drying will result in significant odors that cannot easily be mitigated.  <u>Alternatives 3A, 3B, 3C, 3D:</u>  DLD disposal of sludge will also result in an odor problem.
	Emissions	Primary: Long-Term	<u>Alternatives 1A, 1C, 1E, 1G, 2A, 2B, 3A, 3D:</u>  Minimal increases in emissions along truck routes may affect local residential areas.
	Dust and noise	Primary: Short-term	<u>All Alternatives:</u>  Temporary increases in dust and noise due to construction may affect local residential areas.
Biological Resources	Aquatic organism degradation	Primary: Long-term	<u>Alternatives 3A, 3B, 3C, 3D:</u>  Aquatic organisms in local drainage canals and streams may be affected by sedimentation and water quality degradation.
	Loss of habitat	Primary: Short-term	<u>All Alternatives:</u>  Temporary loss of habitat will occur during construction of all facilities.
Cultural Resources	None	NA	NA

Table 3-4. Summary of environmental consequences of 14 optimal alternatives (concluded).

<u>IMPACT CATEGORY</u>	<u>IMPACT</u>	<u>IMPACT TYPE &amp; DEGREE</u>	<u>IMPACT DESCRIPTION</u>
Population	Induced growth	Secondary: Long-term	<u>All Alternatives:</u>  Sludge management facilities, will facilitate growth in the project area consistent with local planning.
Transportation, Community Service and Land Use	Traffic	Primary: Long-term	<u>Alternatives 1A, 1C, 1E, 1G, 2A, 2B, 3A, 3D:</u>  Truck traffic will cause some congestion, noise, and dust problems in residential areas. Damage to residential streets also may occur.
	Land Use	Primary: Long-term	<u>Group 1 (1A-1H) and Group 3 (3A-3D):</u>  Montesa Park and DLD areas will be rezoned to conform with proposed uses.
		Secondary: Long-term	Land will change to urban uses due to expected population growth.
	Community services	Primary: Short-term	<u>Alternatives 1B, 1D, 1F, 1H, 3B, 3C:</u>  Construction of pipelines potentially will cause temporary disruptions in utility services to residential and commercial areas in South Albuquerque.
Economics	Economic stimulation	Primary: Long-term	<u>All Alternatives:</u>  Federal funds for facility construction will enter and stimulate the local economy.
		Secondary: Long-term	<u>All Alternatives:</u>  Economic growth will be stimulated by expected population increases.
	Financial burden	Primary: Long-term	<u>All Alternatives:</u>  Monthly user charges of \$0.51 to \$1.91 will not be a financial burden to the local community.
Energy Resources	Energy consumption	Primary: Long-term	<u>Alternatives 1A, 1C, 1E, 1G, 2A, 2B, 3A, 3D:</u>  Additional fuel consumption will occur due to truck transportation
Environmental Health	Airborne particulates	Primary: Long-term	<u>Alternatives 1C, 1D, 1E, 1F, 1G, 1H, 3A-3D:</u>  Odors, disease vectors, and pathogenic aerosols potentially will be generated by open air drying, composting, or DLD operations associated with these alternatives.
	Radiation effects	Primary: Long-term	<u>Alternatives 1A, 1B, 1C, 1D, 1G, 1H:</u>  General population will not receive additional radiation. Operators will have an increased chance of fatal cancer of 0.05%.
Recreation and Aesthetics	Area Recreation	Primary: Long-term	<u>Alternative Group 1 (1A-1H):</u>  Construction and operation will have a minor effect on shooting and vehicle recreation near Montesa Park.
	Visual Aesthetics	Primary: Long-term	<u>Alternative Group 3 (3A-3D):</u>  DLD operations will be unsightly to nearby landowners.



### 3.4 COST-EFFECTIVENESS ANALYSIS

Subsequent to issuance of the Draft SEIS, the City made several changes to their proposed project, as previously described in Section 3.1. Included in the changes made by the City were revisions in the estimated costs of the proposed project. In addition, minor changes were made to costs associated with other alternatives to correct miscellaneous inconsistencies contained in the Draft SEIS. Information provided to EPA by the City included costs of designing and constructing new sludge management facilities (i.e., capital costs); costs for operating the facilities and making repairs as necessary (i.e., annual O&M costs); and costs representing the value of certain useful pieces of equipment or valuable land at the end of the planning period (i.e., salvage value).

Several of the alternatives have a high capital cost, but are inexpensive to operate. Others are cheap to build, but expensive to operate. In order to compare the alternatives on an equal basis, EPA conducted a cost-effectiveness analysis of the optimal alternatives (Table 3-5). This analysis indicates the total present worth (and total annual equivalent cost) of each alternative for a 20-year period with an interest (discount) rate of 7 3/8% per year. The analysis also lists the total annual equivalent cost per ton of sludge processed. The cost-effectiveness analysis determined that the City's proposed system (Alternative 1B) is the most cost-effective system. The analysis also determined that all Group 1 alternatives potentially are eligible for 85% funding as innovative/alternative systems.

Table 3-5. Cost-effectiveness analysis of optimal alternatives, with a credit (10,740 ton/yr. at \$70/ton) given for utilization of sludge on public parks.

Alters.	Capitol Cost		Annual O&M	PW O&M (10.2921)	Salvage Value	PW Salvage Value (0.2410)	Total PW	Total Annual Equivalent (0.0972)	Cost Per Ton	Rank- ing
	Grant Eligible	Ineligible								
1A*	25,699,100	0	17,400	179,100	2,030,100	489,300	25,388,900	2,467,800	230	8
1B* <sup>(1)</sup>	26,427,100	80,000	(224,800)	(2,313,700)	4,092,000	986,170	23,207,200	2,255,700	210	3
1C*	22,872,600	0	119,300	1,227,800	597,000	14,400	24,086,000	2,341,200	218	4
1D*	23,600,600	80,000	(122,900)	(1,264,900)	2,659,500	640,900	21,774,800	2,116,500	197	1
1E*	19,063,500	0	496,900	5,114,100	(2,722,900)	(656,200)	24,833,800	2,413,800	225	6
1F*	19,791,500	80,000	204,700	2,209,100	(661,000)	(159,300)	22,239,900	2,161,700	201	2
1G*	22,817,500	0	273,800	2,818,000	523,100	126,100	25,509,400	2,479,500	231	10
1H*	23,545,500	80,000	316,000	3,252,300	2,585,000	623,000	26,254,800	2,552,000	238	11
2A <sup>(2)</sup>	16,622,200	0	770,000	7,925,900	1,785,800	43,000	24,505,100	2,381,900	222	5
2B	18,383,400	0	640,200	6,589,000	2,601,900	62,700	24,909,700	2,421,200	225	7
3A	29,188,700	0	558,600	5,749,200	9,475,700	228,400	34,709,500	3,373,800	314	14
3B	31,382,700	165,500	103,306	1,063,200	13,103,000	315,800	32,295,600	3,139,100	292	13
3C	28,719,300	212,500	264,900	2,726,400	8,084,800	1,948,500	29,709,700	2,887,800	269	12
3D	25,688,200	0	657,600	676,800	3,893,000	938,200	25,426,800	2,471,500	230	9

\* Potentially eligible for 85% Federal funding.

<sup>(1)</sup> Alternative 1B is the City's proposed project.

<sup>(2)</sup> Most cost-effective conventional system.

# **CHAPTER 4**

## **EPAS PROPOSED ACTION AND ENVIRONMENTAL CONSEQUENCES**

#### 4.0 EPA'S PROPOSED ACTION AND ENVIRONMENTAL CONSEQUENCES

Based upon the evaluation of information presented in the Draft SEIS, public comment on the Draft SEIS, additional information received from the City, and the evaluation of alternatives presented in Chapter 3.0, EPA has made certain decisions concerning the allowable value of sludge and the amount of grant funds which should be given to the City. This chapter describes these recent EPA decisions, identifies EPA's proposed action, and describes the environmental consequences of the proposed action.

##### 4.1 ALLOWANCE OF CREDIT FOR SLUDGE

The fact that sludge is a valuable resource was noted in Section 5.7 of the Draft SEIS. It was also noted that the City had requested a credit of \$70/ton for using sludge as a soil conditioner on public lands. This request was based upon the fact that expensive commercial fertilizer would have to be purchased for use on public lands if sludge was disposed by landfill or DLD, and thus not available for use as a soil conditioner. At the time the Draft SEIS was issued, EPA was not convinced that a credit of \$70/ton was valid, since no offsetting revenues would be generated by the City's self-utilization of sludge. Subsequent to issuance of the Draft EIS, additional material was provided by the City and EPA's Robert S. Kerr, Environmental Research Laboratory which indicated that nitrogen, phosphorous, chelated iron, and valuable trace minerals found in sludge potentially are worth much more than \$70/ton (see letter in Appendix A dated 22 December 1981 to W.H. McMullen from George A. O'Connor). Based upon the evaluation of this new material, EPA proposes to allow a credit of \$70/ton of sludge (i.e., \$70/ton x 10,740 tons/year = \$751,800/year) for all Group 1 alternatives, since these alternatives all propose disposal of sludge by landspreading as a soil conditioner. This credit was reflected in the cost-effectiveness analysis (Table 3-5) presented in Section 3.4 of this document.

##### 4.2 IDENTIFICATION OF FUNDABLE ALTERNATIVES

Information presented in the Draft SEIS regarding Federal funding of alternatives through the Construction Grant Program was based upon provisions of the Clean Water Act of 1977 (P.L. 95-217). Major changes were made in the Construction Grant Program by the Municipal Wastewater Treatment Construction

Grant Amendments of 1981 (P.L. 97-117). These proposed changes were published in draft form on 6 November 1981; interim final regulations were published on 12 May 1982 and are effective for all grants awarded on or after this date. The major regulations which affect the funding of the Albuquerque project are as follows:

- Prior to 1 October 1984, a grant to construct a conventional treatment system will be equal to 75% of the capital cost; on or after 1 October 1984, a grant to construct a conventional system will be equal to 55% of the capital cost.
- Prior to 1 October 1984, a grant to construct an innovative or alternative treatment system will be equal to 85% of the capital cost; on or after 1 October 1984, a grant to construct an innovative or alternative treatment system will be equal to 75% of the capital cost.

This means that, as long as the City receives a construction grant prior to 1 October 1984, the allowable funding will be 75%/85% for conventional/innovative systems respectively, which is the exact same funding that was available under the old law described in the Draft EIS. Since the Phase II expansion proposed by the City is to be built and operated from 1984-1990, it is assumed for purposes of this final EIS that the City will receive a grant prior to 1 October 1984.

Before a grant can be given, EPA must decide which alternatives are conventional, and which (if any) qualify as innovative/alternative technology. Since each of the Group 1 alternatives (i.e., alternatives 1A-1H) provides for the ultimate reuse of sewage sludge as a soil conditioner (i.e., resource recovery), EPA has determined that the Group 1 alternatives qualify as an alternative system eligible for up to 85% funding. In addition, EPA has determined that the solar greenhouse, and Cesium-137 irradiator are innovative treatment processes. Since these processes have been determined to be innovative, EPA potentially will fund up to 85% of the cost of each process (subject to availability of funds), and in addition will fund up to 100% of the cost of replacing the process if it fails within two years after start-up. Group 2 and Group 3 alternatives were determined to be conventional treatment systems.

Before an innovative/alternative system can be funded, its total present worth cost must not be more than 115% of the most cost-effective conventional system. The most cost-effective conventional system alternative (as shown in Table 3-5) is Alternative 2A, which has a total present worth of \$24,505,100. Therefore EPA cannot grant funds for any innovative/alternative system that has a total present worth of more than  $1.15 \times \$24,505,100 = \$28,180,900$ . None of the Group 1 alternatives has a total present worth greater than this amount; therefore, any of the Group 1 alternatives is fundable up to 85% of the alternative's grant eligible capital cost.

EPA can only give a grant for a conventional system equal to 75% of the capital cost of the most cost-effective conventional system. The capital cost of Alternative 2A is \$16,622,200; therefore, EPA can fund 75% of the grant eligible capital cost of any conventional system up to a maximum of  $0.75 \times \$16,622,200 = \$12,466,700$ . This means that funding of any Group 2 or Group 3 alternative will be limited to a maximum grant of up to \$12,466,700.

#### 4.3 IDENTIFICATION OF EPA'S PROPOSED ACTION

Based on the cost-effectiveness analysis (Table 3-5), the top ranking alternatives occur in Group 1. However, the Draft SEIS and Section 3.3 of this document both indicate that environmental problems might be associated with some of the Group 1 innovative/alternative systems. Open-air drying, involving sludge spread over a seven-acre area, potentially will generate significant odors and dust problems that cannot be enclosed or controlled. Similarly, composting will involve sludge piled over a four-acre area, potentially generating similar odor and dust problems. Concerns also were raised by the US Air Force and the general public regarding bird strike hazards (i.e., bird interference with flying aircraft) and the dispersion of pathogenic aerosols due to the use of open air drying and/or composting systems. The City of Albuquerque currently is under court stipulations to utilize best available technology to avoid odor problems similar to those that have occurred in the past at Plant No. 2. EPA does not believe that utilization of open-air drying or composting would be in conformance with the court stipulations placed upon the City. Because of the adverse environmental impacts associated with the open-air drying and composting components, EPA does not propose to fund Alternatives 1C, 1D, 1E, 1F, 1G, or 1H.

Of the two remaining alternatives (1A and 1B), Alternative 1B, the City's currently proposed project, is the most cost-effective and environmentally sound. Therefore, EPA proposes to give to the City of Albuquerque a grant of up to 85% of the eligible costs of construction of Alternative 1B. In addition, the City potentially will receive a 12.5% state grant from the New Mexico EID, which will leave approximately 12.5% of the costs of constructing Alternative 1B to be financed by the City.

#### 4.4 ENVIRONMENTAL CONSEQUENCES OF EPA'S PROPOSED ACTION

Since EPA proposes to fund the City's currently proposed project, the consequences (i.e., effects) to the physical or natural environment that will occur as a result of EPA's proposed action are described in Section 3.2 of this document.

**CHAPTER 5**  
**CORRECTIONS & ADDITIONS**  
**TO THE DRAFT**  
**SUPPLEMENTAL EIS**



## 5.0 CORRECTIONS AND ADDITIONS TO THE DRAFT SEIS

This chapter contains revisions made to the Draft SEIS based on new or more complete information, changes in City of Albuquerque's project since release of the Draft SEIS, or errors and omissions identified through the public review process. Minor changes are incorporated as errata in Section 5.1. Where significant changes were required, the entire page from the Draft SEIS has been reprinted, with the changes highlighted by vertical lines. The reprinted pages are contained in Section 5.2.

### 5.1 MINOR CORRECTIONS (Errata Sheet)

The following changes to the Draft SEIS are editorial in nature, and are relatively minor. Consequently, the affected pages have not been reprinted in full. The changes listed below are hereby incorporated into the Draft SEIS (with respect to the page and paragraph numbering, paragraph 1 is considered to be the first full paragraph on a page).

1. Page 1-4, paragraph 1, line 13: Delete end of sentence starting at "funding of an ..." and add: "it is possible that some funding may be available from the USDOE for the design and construction of the irradiator."
2. Page 1-8, paragraph 3, line 2: Delete "... the design and ...".
3. Page 2-2, Sections 5.8 and 5.9: Change the page number to 5-49.
4. Page 2-7: Delete Table 5-17.
5. Page 3-1, paragraph 1, line 1: Change Step 1 Grant number to (C-35-1020-01).
6. Page 4-2, Section 4.3: Add an additional bullet which reads as follows:
  - Potential impact on land use and potential development of lands adjacent to Montesa Park.
7. Page 5-1, paragraph 2, line 10: Complete sentence by adding "... City's Phase I-A expansion program scheduled for completion in 1984."
8. Page 5-7, continuation of paragraph from preceding page, line 2: Change to read: "... was denied a grant offer and decided not to construct either their preferred ...".
9. Page 5-11, Table 5-6: Add "Heat Treatment" to the options listed for the disinfection component.

10. Page 5-12, Table 5-7: Add the following footnote to the title:

A base option is defined as the sole wastewater solids management system which, during evaluation of the feasible alternatives, appears able to provide reliable treatment and disposal of sludge at all times under all circumstances for the specific situation being evaluated.

11. Page 5-18, Table 5-10, Alternative Group 1, Disinfection component: Add the following footnote to the electron beam option: "Electron beam irradiation would probably take place prior to dewatering."
12. Page 5-20, paragraph 2: Delete the first sentence and combine paragraph 1 and 2.
13. Page 5-21, paragraph 4, line 1: Delete "such as the Zimmerman or Zimpro process".
14. Page 5-22, paragraph 1, line 6: Change the words "to close" to "approximately".
15. Page 5-22, paragraph 1, line 14: Change the word "feed" to "sludge".
16. Page 5-25, paragraph 1, line 9: Delete the phrase "also shown in Figure 3-1."
17. Page 5-28, paragraph 3, line 7: Delete the words "open air".
18. Page 5-32, paragraph 2, line 8: Delete the word "using".
19. Page 5-42, paragraph 1, line 9: Change the phrase "to document" to "reporting".
20. Page 5-42, paragraph 1, line 10: Change the sentence to begin: "This amount was based upon the belief that ...".
21. Page 5-48: Delete Table 5-17.
22. Page 5-49, Section 5.8, line 1: Change (1) to begin: "issue a construction grant ...".
23. Page 6-31, paragraph 2, lines 3 and 7: Add "and irrigation" after the word application.
24. Page 6-38, paragraph 1, line 9: Change the word "Group" to "Division".
25. Page 6-38, paragraph 1, line 10 and line 12: Change "i.e." to "e.g."
26. Page 6-50, paragraph 2, line 1: Add the following phrase after "gamma rays": "which are physically the same as X-rays,".
27. Page 6-52, paragraph 1, line 4: Change the line to read: "... levels outside the Boston pilot facility ...".

28. Page 6-69, paragraph 1, line 7: Change the words "Step 2 or Step 3 grants" to "construction grant".
29. Page 6-69, paragraph 1, line 12: Change the word "significant" to "cultural".
30. Page 6-69, paragraph 1, line 13: Delete the word "potentially".
31. Page 6-83, paragraph 2, line 3: Delete the following part of the sentence "if any alternative in Group 1 is selected, employment in the local fertilizer industry potentially will stagnate or decrease due to the City providing its own fertilizer for land spreading on City Parks".
32. Page 6-94, paragraph 1, line 3: Insert the following sentence at the end of the first sentence: "Several types of safety systems provide redundancy in the system and thereby substantially reduce the chance of accidents.".
33. Page 6-95, paragraph 3, line 9: Change the word "eliminate" to "reduce the".
34. Page 6-97, paragraph continued from the preceeding page, line 2: Change "300" to "210".
35. Page 6-100, paragraph 1: Add the following sentence at the end of the paragraph: "Hills on the south side of the Tijeras Arroyo are commonly used for hang gliding.".
36. Page 6-103, paragraph 1, line 2: Reverse the first two words of the sentence to read "Should EPA ...".
37. Page 6-103, paragraph 2, line 2: Change the words "only City and State" to "other".
38. Page 7-2, paragraph 2, line 6: Change the line to read: "... appointed by the City of Albuquerque".
39. Page 7-3, Table 7-1: Delete "Transcript of Public Hearing" (bullet number 22).
40. Page 7-6, paragraph 1, line 3: change the line to read: "... Project Engineer; Mr. Steve Romanow, EPA Construction Grants Project Engineer; Mr. Steve Rubin, EPA Construction Grants Project Engineer; and by ...".
41. Appendix 10.2, second page, paragraph 1, line 1: Change the phrase "5 to 7" to "15".
42. Appendix 10.2, thirteenth page, paragraph 1, line 6: Change the word "exposure" to "overexposure".

## 5.2 MAJOR CORRECTIONS

The following pages were reprinted due to the inclusion of extensive changes on the page. Sentences which have been changed are indicated by a vertical line in the left margin.

- Applicants for grant funds must analyze methods, processes, and techniques to reduce total energy consumption and to increase the open space and public recreation potential of lands, waters, and rights-of-way that are parts of a proposed project.
- The objectives of the CWA for sewage sludge management are to ensure protection of public health and the environment by promulgation of minimum Federal standards for sludge disposal and utilization and to maximize beneficial uses of sludges that conform to Federal standards.

The principal technical planning document for wastewater collection and treatment in the City of Albuquerque, New Mexico, and several outlying areas is the Final Albuquerque Areawide Wastewater Collection and Treatment Facilities Plan, which was prepared by the City of Albuquerque under the requirements of the CWA, and funded by EPA as Grant No. C-35-1020-01 under the construction grants program. Since the awarding of additional grants for design and construction of any wastewater treatment facilities had the potential for significant impact(s) to the natural and human environment, EPA determined that preparation of an environmental impact statement (EIS) was necessary. This EIS was prepared simultaneously with the preparation of the areawide facilities plan. Draft and Final EISs were published during June and August 1977, respectively.

On 27 September 1978, EPA published in the Federal Register the final regulations concerning Federal grants for the construction of treatment works. These final regulations implemented the previously mentioned significant changes in the FWPCA, as caused by the CWA. Due to the increased significance and new funding incentives placed upon systems involving innovative and alternative technology, energy conservation, resource recovery, new Federal regulations governing the land application of wastewater sludges, increased public concern regarding odors, and desire to provide more in-depth analyses of some of the facilities plan proposals and alternative processes, the City of Albuquerque entered into a program of revising and upgrading its areawide facilities plan. An additional study entitled "City of Albuquerque, New Mexico Southside Wastewater Reclamation Plant No. 2 - Phase II Expansion Report" was published during January 1980. The final version of this report was completed during January 1981 and was forwarded to EPA as a proposed facilities plan amendment on 21 January 1981. The City has initiated the review process required to formally amend the Comprehensive Plan's Facilities Plan element by adopting the Phase II Expansion Program Report as an amendment.

Federal funding for wastewater treatment projects is provided under the Municipal Wastewater Treatment Construction Grant Amendments of 1981 (Public Law 97-117). This Act provides 75% Federal funding (i.e., grants) through September 1984 and 55% thereafter for eligible planning, design, and construction costs; the grant applicant pays the remainder of the capital cost plus all operation and maintenance expenses. Portions of projects that are defined as innovative or alternative are eligible for 85% funding through September 1984 and 75% thereafter under P.L. 97-117. Funding of an additional 12.5% of eligible costs also is available under the New Mexico Environmental Improvement Division (NMEID) Construction Grants program. A three-step process was provided by the Clean Water Act of 1977. Step 1 involved facilities planning; Step 2 involved development of detailed engineering plans and specifications; and Step 3 involved construction of the pollution control facilities. With the 1981 amendments, grants will now be given at the beginning of Step 3, but may include some allowance for satisfactory completion of facilities planning and design work. The City of Albuquerque's sludge management project currently is in the planning phase with the facilities plan amendment developed for design year 1990.

Public Law 97-117 requires that EPA identify and select for funding an alternative that is cost-effective, environmentally sound, and publically acceptable. EPA defines a cost-effective alternative as one that has minimum total resource costs over the life of the project and meets Federal, state, and local requirements. It is not necessarily the least-cost alternative. The choice of the most cost-effective alternative is based on both capital (construction) costs and operation and maintenance costs for a twenty-year period, although only capital costs are grant eligible.

### 3.3 OTHER FEDERAL AND STATE LEGISLATIVE REQUIREMENTS

Sludge management is subject to a number of legislative and institutional requirements; however, sludge usually has not been singled out for separate legislative treatment at the state or Federal level. Instead, it has been included within the statutory scope of regulations concerning substances generally considered to be pollutants that are discharged into water or disposed on land. Under these regulations, disposal of raw or treated sludge into water is subject to restrictions relating to biochemical oxygen demand (BOD), coliform organisms, suspended or settleable solids, and toxic materials. The net effect has been to inhibit disposal of

Table 3-1. Pertinent Federal, state, and local environmental legislation and regulations affecting sludge management alternatives applicable to the City of Albuquerque sludge management system.

FEDERAL LEGISLATION

APPLICABLE FEDERAL REGULATIONS

Clean Water Act and  
Federal Water Pollution  
Control Act Amendments of  
1981 (Public Law 97-117)

National Pollution Discharge  
Elimination System (NPDES),  
40 CFR Part 125

Criteria for the Classification of  
Solid Waste Disposal Facilities  
and Practices (40 CFR Part 257)

Federal Construction Grants  
Regulations (40 CFR Part 35)

Safe Drinking Water Act

Clean Air Amendments  
of 1970

National Environmental  
Policy Act of 1969

Solid Waste Disposal Act  
as amended by the  
Resource Conservation  
and Recovery Act

Hazardous Waste Regulations  
40 CFR Parts 260-265

Criteria for the Classification of  
Solid Waste Disposal Facilities  
and Practices (40 CFR Part 257)

Toxic Substances Control Act

PCB Regulations (40 CFR Part 761)

Atomic Energy Act of 1954,  
as amended

Standards for Protection Against  
Radiation (10 CFR Part 20)

Domestic Licensing of Production  
and Utilization Facilities  
(10 CFR Part 50)

Packaging of Radioactive Material  
for Transport and Transportation  
of Radioactive Material Under  
Certain Conditions (10 CFR  
Part 71)

Table 3-1. Pertinent Federal, state, and local environmental legislation and regulations affecting sludge management alternatives applicable to the City of Albuquerque sludge management system (concluded).

STATE LEGISLATION

New Mexico Air Control Act

Public Nuisance Provision,  
New Mexico Statutes

New Mexico Water Quality  
Act as amended

STATE REGULATIONS

Water Quality Control Commission  
Regulations for Surface Water  
and Groundwater

LOCAL MUNICIPAL AND COUNTY REGULATIONS AND ORDINANCES

Air Pollution Control Regulations of the Albuquerque-Bernalillo County Air  
Control Board

Zoning Ordinances of the Albuquerque/Bernalillo County Planning Department

1973 Lawsuit and Stipulation (Mt. View et al. vs. Fri et al.), control of  
odor and use of "Best Practical Control Technology".

1980 Lawsuit and Stipulation (State of New Mexico vs. City of Albuquerque),  
requiring the City to (1) not vent odorous gases, (2) discontinue the use  
of sludge drying beds at Plant No. 1, (3) remove sludge on a daily basis  
from Plant No. 1, and (4) renovate the sludge digesters.

Revised Ordinances of Albuquerque, New Mexico. 1974. Section 7-Environmental  
Ordinances and Regulations, including: Chapter 6 (health, safety, and  
sanitation), Chapter 7 (zoning, planning, and building), and Chapter 8  
(water, sewer, and streets).

lb/day of dry solids would be produced. The effluent would violate limitations established in the City's state and federal discharge permits.

It is expected that the City of Albuquerque would implement emergency measures in order to handle 60 mgd of wastewater and the subsequent volume of sludge produced. It is anticipated that existing drying beds would continue in operation at maximum capacity. Sludge not dried on drying beds would be stored in lagoons located north of the existing wastewater treatment facilities. Sludge cake removed from the drying beds (47% solids) would be stockpiled at Montesa Park, as at present. It is noted that EPA could exercise its authority to levy fines against the City of Albuquerque for violation of discharge permit effluent limitations. A civil penalty not to exceed \$10,000 per day of such violation could be sought by EPA. If a violation is willful or negligent, the fine may range from \$2,500 to \$25,000 per day of violation.

As a result of no action, there potentially would be environmental degradation to the Rio Grande River from deteriorated effluent quality; to groundwater from leachate emanating from the sludge lagoons to be located at Plant No. 2, existing unlined drying beds, and stockpiles; and to receiving surface waters from lagoon overflow and stockpile runoff. Water soluble components of heavy metals currently found in the sludge that might contaminate the groundwater or surface water via sludge leachate, are listed in Table 5.3.

The scenario outlined above could only exist on a short-term basis. Although it is unlikely, the City of Albuquerque could choose to pay fines levied against it for noncompliance with permit stipulations. However, because lagoons and stockpiles require large land areas that are aesthetically displeasing, are unacceptable as long-term sludge disposal methods, and would be in violation of recent legal stipulations, the City of Albuquerque eventually would have to take long-term action to address the needs of their sludge management system.

### 5.3 SCREENING OF PRELIMINARY SLUDGE TREATMENT AND DISPOSAL COMPONENTS AND COMPONENT OPTIONS

The screening (i.e., evaluation) of preliminary sludge management alternatives was accomplished based on the following steps:

- selection of relevant evaluation criteria,



walls. Sludge would be removed from the open air stockpile at approximately 40% solids. Figure 5-3 illustrates the proposed site layout for solar drying facilities at Montesa Park. The second drying option is open air drying, consisting of six 50,000 sq ft drying areas (6.9 acres) similar in design to the drying areas that would be used after the solar greenhouses. The sludge would be tilled daily during open air drying. Figure 5-4 illustrates the proposed site layout for open air drying facilities at Montesa Park. The concept of using drying facilities at sites other than Montesa Park was not investigated by the City.

#### 5.5.6 Disinfection

In the past, disinfection was not required prior to the application of sludge on land. The City of Albuquerque has utilized undisinfected sludge on parks and golf courses for many years. This practice was stopped with the promulgation of EPA's current sludge disposal regulations (40 CFR Part 257) requiring disinfection of sludge prior to application on land or incorporation into the soil. For landfilling and dedicated land disposal, anaerobic digestion adequately reduces pathogens if certain restrictions are placed on the use of the site (these restrictions are discussed in more detail in Section 6.11). However, for landspreading on public lands, additional disinfection is now required by EPA regulations. Irradiation using Cesium-137, electron beam irradiation, or composting are the three disinfection options selected for further study. A detailed description of the Cesium-137 irradiator and the electron beam irradiator is presented in Appendix 10.2 and 10.3, respectively.

The City of Albuquerque and the DOE have agreed that DOE will loan the Cesium-137 to the City, deliver it to the Montesa Park site, install Cesium-137 in an irradiator, and subsequently remove spent Cesium-137 from the site if the Cesium-137 irradiation option is selected. All handling and transportation of Cesium-137 would be carried out with DOE assistance and/or supervision in compliance with all applicable Nuclear Regulatory Commission (NRC) regulations and guidelines, as well as other Federal regulations (Table 3-1). Irradiation would take place in a concrete structure below the ground surface. The Cesium-137 would remain stationary while sludge would be passed through the system. DOE would replenish the Cesium-137 supply periodically, by adding source capsules. It would not be necessary to remove the spent capsules. In discussion with DOE, the City has been assured that DOE would take the lead in any possible accident which might involve clean-up. A formal agreement will be executed addressing this and other aspects of DOE participation if this alternative is approved for funding.

Table 5-11. Potential environmental concerns associated with each optimal component option evaluated for the Albuquerque sludge management program.

<u>COMPONENT</u>	<u>OPTION</u>	<u>SIGNIFICANT CHARACTERISTICS</u>	<u>CATEGORY POTENTIALLY AFFECTED</u>
Thickening	Dissolved Air Flotation	Emissions may contain volatile organics	Air
Stabilization	Anaerobic Digestion	Supernatant return may cause treatment plant upsets	Surface water
Conditioning	Polymer	Toxic in high concentrations Cost tied to energy (oil) prices	Operator safety Economics
	Lime/ $\text{FeCl}_3$	Increases sludge production	(Depends on disposal option)
Transportation	Truck	Increased traffic, noise, and exhaust; fuel consumption	Public safety, nuisance, air, energy
	Pipeline	Traffic disruption, noise, dust during construction; possible leaks to soil, arroyos, or river at crossing; energy re- quired for lift stations	Public safety, nuisance, air, groundwater, surface water, energy
Dewatering	Belt Press	Odors, leachate	Air resources, surface water, groundwater
	Filter Press	Odors, leachate	Air, surface water, groundwater
Drying	Solar Green- house	Buildings and air drying require significant land area; may generate fugitive dust; odor	Land, aesthetics, surface water, groundwater, air, nuisance
	Open Air	Large land requirement; dust; odor; possible leachate; possible insect attraction, and therefore bird strike hazard	Land, aesthetics, surface water, groundwater, air, airplane safety

matter content, total nitrogen, and soil aggregation increased significantly. Benefits were found to be greater in sandy soil than in loam. These benefits are largely the result of tilling the sludge into the soil. When the sludge is spread on top of the soil, the primary benefit will be the leaching of fertile nutrients and trace minerals from the sludge (National Academy of Sciences 1977).

Concentration of nutrients that increase soil fertility (nitrogen, phosphorus, and potassium) are considerably lower in sludge than in commercial fertilizers. Therefore, sludge generally needs to be applied very heavily in comparison to commercial fertilizers in order to deliver similar nutrient value. Much of the nitrogen in sludge is organic and is only slowly available to plants since it must first convert to inorganic forms. Phosphorus and potassium are considered to be as available in sludges as in commercial chemical fertilizers (National Academy of Sciences 1977). Thus, if sludge is applied at somewhat conservative rates as compared to its "safe" nutrient limits, there is much less likelihood of soil contamination problems. Similarly, if sludge is applied heavily in order to achieve nutrient values comparable to commercial fertilizers, toxic metals entering soil from the sludge may exceed "safe" limits.

#### - Landfilling

The alternatives utilizing landfilling involve the use of a refuse landfill for the disposal of sludge from treatment Plant No. 2. Proper construction and management of the landfill in accordance with state and Federal requirements should effectively limit any environmental problems. The importance of this is emphasized due to the sandy and gravelly subsurface in possible landfill areas, which allows for more extensive leaching possibilities. Proper installation of a clay liner will prevent toxic elements from entering the soil or geologic strata outside the landfill boundaries. Nitrates, gases, pathogens, and toxic metals occurring in a landfill emphasize further the importance of its proper construction and the use of a liner. The impact of the disposed sludge is significantly lessened due to the presence of toxic materials already disposed in typical municipal solid waste landfills.

Wind and/or water erosion are potential problems associated with landfill operations. Soil to be used in the landfill operation is likely sandy

and easily wind-blown in the Albuquerque area. Water erosion could affect the surrounding area by carrying contaminated surface runoff outside the boundary of clay linings if the topography of the landfill were to rise above the surrounding area. A further consideration concerns usefulness of the sludge itself. The potentially beneficial fertilization and soil conditioning characteristics from landspreading are lost by use of the landfill disposal method.

- Dedicated Land Disposal at Pajarito and Rio Puerco

An additional alternative for sludge disposal involves setting aside a particular land area for the sole purpose of sludge disposal. The upper soil layer is directly affected by the process of plowing and sludge injection. As with other alternatives, careful management practices should make this a viable alternative while adverse affects could result from improper monitoring. The City's description of DLD alternatives do not describe proposed monitoring programs.

One item of environmental concern to earth resources is the effect upon soil productivity at a DLD site. Nothing will grow during active DLD operations, and productivity following its use as a DLD site is questionable. Careful monitoring of toxic elements, following USDA guidelines, should allow for food chain crop growth following the site's use as a disposal area. Copper is the only toxic parameter which, from sludge sampling, exceeds the USDA guidelines. Toxics will build up so that unlimited use of an area following DLD operations will be limited over a period of years (probably between 20 and 30).

Another major environmental concern is water erosion and erosion due to wind blowing. During dry periods severe dust problems are likely in the two barren areas proposed for DLD sites because of the constant plowing and loosening of topsoil.

Lagoons are proposed at the DLD sites to store sludge prior to its application by injection. Since the lagoons will have a concentration of toxics directly received from the treatment plant, they deserve more intensive environmental monitoring than the DLD application area.

Table 6-2. Effects of Optimal Alternatives for the City of Albuquerque Sludge Management Program on Earth Resources.

No.	Alternatives	Effects													
		Increased Wind Erosion	Increased Water Erosion	Cadmium Increase	Copper Increase	Nitrogen Increase	General Toxic Increase	pH Increase	Chemical Alteration	Productivity Alteration	Permeability Increase	Corrosion Increase	Excavation Problems	Surface Leveling	Loss of Valuable Resource
1.	1A			o	o	o	o		o	o					
2.	1B			o	o	o	o		o	o			•		
3.	1C			•	•	•	•		•	o					
4.	1D			•	•	•	•		•	o			•		
5.	1E			o	o	o	o		o	o					
6.	1F			o	o	o	o		o	o			•		
7.	1G			•	•	•	•		•	o					
8.	1H			•	•	•	•		•	o			•		
9.	2A	o	o					o							•
10.	2B	o	o					o							•
11.	3A	•	o	•	•	•	•		•	•	o			o	
12.	3B	•	o	•	•	•	•		•	•	o	o		o	
13.	3C	•	o	•	•	•	•		•	•	o	o		o	
14.	3D	•	o	•	•	•	•		•	•	o			o	

use

• - significant

o - minor

- Water Rights

New Mexico's water rights allocations near Albuquerque will be indirectly affected by all action alternatives. Each alternative assumes increased population, industrialization, water demand, and water use. These increases are dependent on current appropriations and if increases are sufficient, acquisition of new or abandoned allocations will be necessary.

Currently, the City receives a credit for all groundwater returned via sanitary sewer to the Rio Grande River. As demand and discharge increase this credit will increase also.

### 6.3 GROUNDWATER RESOURCES

#### 6.3.1 Existing Conditions

All of the alternative sites share some common groundwater characteristics as well as some differences. A major similarity of all sites is that they are all recharged by the following methods: precipitation; seepage from streams, drains, canals, surface reservoirs, and applied irrigation water; and underflow from adjacent groundwaters. The order of importance depends on local conditions. All sites have a southwesterly flow, except for the Rio Puerco and Pajarito sites, which are located on the west side of the "trough," and thus have a southeasterly flow. Differences occur in depth to the water table, hydraulic gradient, quality, and uses of water as discussed below.

Approximate depths to water at each site are as follows: Plant No. 2, less than 10 feet; Montesa Park, 210 feet; Pajarito, 470 feet; and Rio Puerco, 800 feet. Possible landfill sites vary in their depth to water, though the general region being considered has an average depth of approximately 100 feet. The gradient is steepest underneath the Rio Puerco site, though it is still less than 1%.

Table 6-7. Potential air effects associated with sludge management options (continued).

#### Cesium-137 Irradiator

- small potential for overexposure to radiation of occupational personnel and the public due to abnormal events (accidents); for more information see Appendix 10.2
- during normal operation, the irradiator will be designed so that there will be no discernible radiation exposure outside the facility
- during normal operation of the pilot irradiation facility at Sandia Laboratories there has been no dose rate over 0.05 rems per year to workers inside the irradiator facility
- since irradiated sludge has a higher content of biodegradable organic matter than composted sludge, it would be more likely to produce an odor problem. However, since Albuquerque has been land applying sand-bed-dried, anaerobically-digested sludge for years, this probably is not a problem (Kowal 1981)

#### Electron Beam Irradiator

- extremely small potential for radiation exposure of occupational personnel and the public since interlocking safety system would shut the system off in case of accidents; when the system is off there is no production of radiation; for more information see Appendix 10.3
- the facility will be designed so that there will be no discernible radiation exposure outside the facility
- during normal operation of a pilot irradiator there has been no measurable radiation exposure to the workers inside the facility
- since irradiated sludge has a higher content of biodegradable organic matter than composted sludge, it would be more likely to produce an odor problem. However, since Albuquerque has been land applying sand-bed-dried, anaerobically-digested sludge on City parks for years without significant complaints from residents living near the parks, this probably will not be a problem (Kowal 1981)

#### Composting

- significant odor could be generated from the sludge before it is covered with an insulating layer if the sludge is not properly digested; minor odor present after insulating layer is applied; odor associated with the air drawn through the pile is greatly reduced by being released into a small pile of screened compost which absorbs the malodorous gases
- pathogenic aerosols could be released during the stacking of the sludge before the insulation layer is placed on the pile
- high concentration of Aspergillus fumigatus (fungi that pose a pathogenic threat to man); generally restricted to the immediate composting area and should not pose a significant health threat to surrounding area

With Group 1 alternatives (1A-1H) the major sources of malodorous emissions associated with sludge management will be located at Montesa Park. Sludge will not be transported to Montesa Park in the second (2A and 2B) and third (3A-3D) groups of alternatives; therefore, the odors associated with these alternatives will be located at Plant No. 2 and the disposal sites.

The Group 1 alternatives involving disposal by landspreading on city parks include, with the exception of 1E and 1F, either solar greenhouse or open air drying which are both potentially significant sources of odorous emissions. Stockpiles, another cause of odors, would also be a part of the first group of alternatives. Alternatives 1A, 1B, 1C, 1D, 1G and 1H will have three stockpiles. One stockpile will be at 20% solid, one at 40% solid, and one at 40% solid that will eventually dry to approximately 90% solid. The 40-90% stockpile would be the largest due to the longer retention time. Alternative 1E and 1F will have two stockpiles: one at 20% solid, and one at approximately 70% drying to 90% solid.

There will be no drying component (greenhouse or open air drying) included in Group 2 or Group 3 alternatives. There will be one stockpile/storage area with a short retention time included in the Group 2 alternatives. The Group 3 alternatives will have no stockpiles. The dedicated land disposal option included in the third group of alternatives is a significant source of odor. These odors will originate at the disposal sites.

Malodorous pollutants related to the sludge handling facilities will either be emitted from a point source (i.e., exhaust gases from the DAF, greenhouse, etc.) or from open sources (i.e., stockpiles, DLD, etc.). These odorants will be transported and diluted by the wind and are greatly influenced by local topography. For instance, the wind and therefore the pollutants are channeled in pronounced valleys such as the Tijeras Arroyo. It should be understood that the intensity of these odors is highly dependent on the proper functioning of the sludge management facility and atmospheric dispersion. Existing and future development surrounding the various alternative sites could be affected during incidents of malodorous upsets at the sludge management facility.



eastern end of the property. The Tijeras Arroyo traverses Montesa Park from east to west and drains into the Rio Grande River. Kirtland Air Force Base is located along the north and east sides of Montesa Park, and the University of New Mexico owns a large tract of land to the south. Montesa Park currently is remote from residential areas and is expected to remain as such (CDM 1980a).

Montesa Park and the area to the north is within municipal jurisdiction, and is zoned SU-1, (Special Use for Sludge Treatment Facility). The area to the south of Montesa Park is zoned A-1, rural and agricultural by the Bernalillo County Planning Commission (Vanervan, J. 1981). Montesa Park has been designated in the Plan for Major Open Space as public open space "to be used for passive recreation, maintenance of scenic areas, preservation of essential resources and other environmental purposes."

A part of Montesa Park is in the 100 year floodplain; however, none of the proposed construction activities are located in the floodplain. In addition, none of the land is considered to be prime or unique farmland (US Department of Agriculture 1980). Access to Montesa Park is provided by Los Picaros Road.

The area north of the City where a landfill site might be chosen contains a mixture of rural residential and agricultural land. The landfill site will be outside the jurisdiction of the City and would be under the land use control of the Bernalillo County Planning Commission. Transportation of the sludge would occur along Interstate 25. New industries in the northern part of the City are anticipated to cause major traffic jams on the frontage roads along Interstate 25.

Land use surrounding both the Rio Puerco and Pajarito sites is undeveloped grassland and shrubland (Middle Rio Grande Council of Governments of New Mexico 1979). There are no residences near the site. Access to the Pajarito site would be provided by Padillas Road, while access to Rio Puerco would be provided by a lightly used rural road. Both of these sites are under the land use jurisdiction of the Bernalillo County Planning Commission and are zoned A-1, rural and agricultural.

- A pipeline to Rio Puerco will disturb the residential area along Lakeview Road and Gun Club road. In addition, construction of a pipeline to Rio Puerco or Pajarito will pass by Harrison Junior High School, which may cause disruptions during construction. In addition, the possibility of someone falling into an open trench is greater.

- A total of 47 round trips by truck per day will be needed to haul liquid sludge between Plant No. 2 and Montesa Park, Pajarito, or Rio Puerco. The trip to Rio Puerco will require trucks to pass through one of the highest traffic volume areas in Albuquerque, thereby increasing the possibility of accident. Disposal at a landfill site will require trucks to pass through the same high traffic area. However, only 5 to 9 round trips per day will be needed.

- Trucks might have to use a highly congested frontage road along Interstate 25 for disposals at the landfill site. Five to 9 trucks will use the landfill site per day; 200 to 300 trucks per day use the present landfill site (by phone, V. Brown 1981). Therefore, the addition of 5 to 9 trucks will have a minimal impact.

- The truck route to the Pajarito DLD site crosses the Rio Grande via the Rio Bravo Bridge. There is some question as to whether this bridge has the capacity to handle this additional traffic. Major structural problems with this bridge developed in 1980, and for significant periods the bridge either was entirely closed or restricted to one lane traffic while heavy repair work was made on the bridge substructure and foundation pile caps.

- If the open air or composting methods attract birds, these uses would be incompatible at Montesa Park with the adjacent airport. Current information regarding bird strike hazards near composting operations indicates this should not be a problem.

- Both Pajarito and Rio Puerco are zoned rural and agricultural. This zoning will have to be changed to allow for the disposal of sludge. The change will not cause a conflict with adjacent land uses.

The effects of each of the 14 action alternatives on transportation and land use are designated in Table 6-16.

Table 6-16. Effects of the action alternatives on transportation and land use.

Alternative	Transportation								Land Use				
	Disrupt Services			Penetrate Sensitive Urban Areas				Streets	Decrease Land Use	Incompatibility with Existing Land Use	Conflict with Existing Zoning	Effect Prime Farmland	Inconsistent with Elements in the Comprehensive Plan
	Water	Sewer	Streets	Neighborhoods	Schools	Hospitals	Parks	Increased Traffic and Accidents					
1A				•				• •					o
1B													o
1C				o				• •					o
1D													o
1E				•				• •					o
1F													o
1G				•				• •					o
1H													o
2A				o				o					
2B				o				o					
3A				•	o			• •	o		o		
3B	o	o	o	•	o				o		o		
3C	o	o	o	•	o				o		o		
3D								•	o		o		

• - Major Effect  
o - Minor Effect

minor and the sump pump would clear it out. The likelihood of the flood water coming into contact with the radioactive material is extremely low since an undetected leak in a source pin would have to occur, concurrently.

Albuquerque is classified as a region of low occurrence of tornadoes, with an annual frequency of 0.1 or less. Because of the low frequency of tornadoes and the fact that most of the structure of the facility is underground, tornadoes are not a significant design consideration. If a tornado were to pass directly over the facility, the most severe damage expected would be damage to the part of the conveyor that extends above the facility.

The technology for using radiation to disinfect sewage sludge is relatively new, with operating irradiators located in West Germany and South Africa. However, irradiation is used routinely to sterilize certain pharmaceutical equipment. Most of the existing industrial irradiators use cobalt (Co-60) as the source of gamma rays, as compared to Cs-137 which is proposed in this project. Although the Albuquerque irradiator will be larger than the existing irradiators and uses a different gamma ray source, the basic technology is similar and therefore it would be useful to present the safety record of some of the existing irradiators. The Director of the appropriate Nuclear Regulator Commission (NRC) must be notified within 24 hours of any incident involving the radioactive material which may have caused or threatens to cause:

(1) Exposure of the whole body of any individual to 5 rems or more of radiation; exposure of the skin of the whole body of any individual to 30 rems or more of radiation; or exposure of the feet, ankles, hands, or forearms to 75 rems or more of radiation; or

(2) The release of radioactive material in concentrations which, if averaged over a period of 24 hours, would exceed certain specified limits; or

(3) A loss of one day or more of the operation of any facilities affected; or

# **CHAPTER 6**

## **COORDINATION**

## 6.0 COORDINATION

### 6.1 RECOMMENDATIONS OF THE CITIZEN ADVISORY COMMITTEE

On 9 December 1981, the Citizen Advisory Committee (CAC) of the City of Albuquerque held their twenty-first meeting and voted on their final recommendation to the City concerning the Albuquerque Wastewater Facilities Expansion Plan, Phase II. Fourteen (14) members of the 15-person committee voted and one member was absent. The vote indicated:

1. A ten-vote majority for resource recycling (i.e., sludge disposal by landspreading) over four votes for dedicated land disposal and no votes for landfill;
2. A nine-vote majority to four votes for the Cesium-137 irradiator over thermal conditioning. There were no votes for composting or electron-beam irradiation and one abstention;
3. A five-vote majority for siting the disinfection facility at Wastewater Treatment Plant No. 2 against three votes for Montesa Park, two votes for Kirtland Air Force Base, two votes for other sites and two abstentions;
4. A seven-vote majority for solar greenhouse drying against five votes for the filter press, two votes for a combination and no votes for open air drying; and
5. For sludge transportation, an eleven-vote majority for the pipeline against two for trucking and one abstention. For dedicated land disposal, a ten-vote majority for the pipeline, two for trucking and two abstentions.

The actual vote was as follows:

	<u>VOTE</u>
1. If dedicated land disposal were selected as the most favorable sludge disposal technique, which transportation process would you favor?	
A. Trucking	2
B. Pipeline	10
Abstentions:	2
2. With dedicated land disposal as the sludge disposal action, which area would you recommend?	
A. Pajarito	0
B. Rio Puerco	0
C. Others	11
Abstentions:	3

	<u>VOTE</u>
3. If landfill were selected as the most favorable sludge disposal technique, which conditioning process would you favor?	
A. Polymer utilization	9
B. Lime/Ferric Chloride utilization	2
Abstentions:	3
4. If landfill were selected as the sludge disposal action, which general area of the city extended to county lines do you favor for site selection?	
A. Northeast Quadrant	3
B. Northwest Quadrant	0
C. Southeast Quadrant	0
D. Southwest Quadrant	2
E. Others	6
Abstentions:	3
5. If sludge recycling were selected as the most favorable sludge disposal technique, which disinfection process do you favor?	
A. Composting	0
B. Electron Beam Irradiation	0
C. Thermal Conditioning	4
D. Cesium-137 Irradiation	9
Abstentions:	1
6. With sludge recycling as the selected process, which general area do you favor for site selection?	
A. Montesa Park	3
B. Adjacent to Plant #2	5
C. Air Force Base	2
D. Others	2
Abstentions:	1
7. With sludge recycling as the selected process, which transportation process do you favor?	
A. Trucking	2
B. Pipeline	11
Abstentions:	1
8. With sludge recycling as the selected process, which final drying procedure do you favor?	
A. Open Air Drying	0
B. Solar Greenhouse	7
C. Filter Press	5
D. Combination	2
Abstentions:	0

	<u>VOTE</u>
9. Which basic sludge disposal procedure do you favor as best answering the City of Albuquerque problem?	
A. Landfill	0
B. Dedicated Land Disposal	4
C. Sludge Recycling	10
Abstentions:	0

Along with their recommendations, the CAC submitted the following statement of protest:

The Citizen Advisory Committee objects to being pressured into adopting recommendations prior to any EPA response to its inquiries, comments and evaluation. It is on record as finding the DEIS to be seriously deficient in the critical areas of project definition, alternate sites and mitigation measures. The DEIS does not contain substantial evidence for a comparative evaluation of the proposed project. It believes that pressure to adopt recommendations under the threat that if it does not do so by December 14, 1981, its recommendations will not appear in the Final EIS, seriously undermines the CAC public participation and EIS processes in their entirety. Therefore, it adopts the recommendations under protest.

## 6.2 SUMMARY OF THE PUBLIC HEARING

A public hearing was sponsored by EPA at 7:00 p.m., 18 November 1981 at City Hall in Albuquerque, New Mexico. The meeting was attended by representatives of EPA and their consultants, the Water Resources Department and their consultants, and approximately 70 interested citizens. The agenda of the meeting was divided into two basic parts: (1) formal presentations by a panel of representatives from EPA, the Water Resources Department, and the Citizen Advisory Committee (CAC), and (2) statements, comments, and questions from the audience. The panel presenting formal statements and the subject of their presentations were as follows:

<u>Person</u>	<u>Topic of Statement</u>
Miles Schulze	Introductory remarks;
Staff Attorney	Rules of Procedure
Regional Counsel	
EPA Region 6	



<u>Person</u>	<u>Topic of Statement</u>
David Neleigh Construction Grants Engineer EPA Region 6	Facilities Planning Process
Darlene Owsley Environmental Specialist EIS Preparation Section EPA Region 6	Environmental Impact Statement and Public Participation
James C. Varnell Project Manager WAPORA, Inc.	Evaluation of Optimal Alternatives
A.K. Khera Water Resources Department and John Burgh Camp, Dresser, and McKee	City's Preferred Alternative
Wiley Smith Member, Citizen Advisory Committee (CAC)	Preliminary Preferred Options of the CAC

Following the formal statements, comments and questions were solicited from the audience. A summary of the comments and EPA's responses is presented in Section 6.4 of this document.

### 6.3 EVALUATION OF THE PUBLIC PARTICIPATION PROGRAM

The Public Participation Program consisted of a joint effort to educate and encourage involvement of the public in selecting the safest and most economical method of sludge treatment and disposal for Albuquerque. The following agencies/organizations participated in this effort:

- Citizen Advisory Committee (CAC);
- USEPA Region 6;
- City of Albuquerque;
- Camp Dresser and McKee, Inc., (the City of Albuquerque's engineering consultant); and
- WAPORA, Inc. (EPA's EIS Consultant).

Input for preparation of this evaluation was received from members of the CAC and the public. These comments were obtained through the use of a checklist distributed at CAC Meeting No. 21, held on 9 December 1981. Twelve of the 15 CAC members and four members of the general public responded to the checklist. Valuable input also was obtained from the City of Albuquerque's Public Participation Staff.

A major element of the Public Participation Program was the formulation of the Citizen Advisory Committee. This committee was developed in December 1980 to study the sludge treatment alternatives available to the City of Albuquerque in order to recommend a preferred alternative. An attempt was made to select CAC members based upon a balanced representation of the Albuquerque population. As a result, the final CAC membership consisted of three public officials, four public interest group representatives, three private citizens and five representatives of economic interest. The members of the CAC (listed in Table 6.1) reside throughout all sections of the city, and various ethnic groups in the area were represented on the committee.

In the final evaluation, most of the CAC members felt that the membership was well balanced. However, two members stated that the committee was "weighted for the irradiator from the beginning." Another member commented that the committee was balanced on the surface only.

The CAC worked long hours through 21 meetings to learn more about the alternatives and to formulate their recommendations. The CAC requested that independent consultants present information on various alternatives to help the CAC in their evaluations. The consultants and the subject of their presentation are as follows:

Dr. Norman Kowal - Epidemiological Aspects of Composting and Cs-137 Irradiation

Dr. John A. Ulrich - Epidemiological Aspects of Composting, Cs-137 Irradiation, and Wet Air Oxidation

Dr. J.C. Robertson - Radiation Hazards and Safety

Table 6-1. Members of the Albuquerque Citizen Advisory Committee.

<u>Name</u>	<u>Category</u>	<u>Affiliation</u>
Kay Grotbeck	Public Interest	Conservation Coordinating Council --Sierra Club (Citizen Activist)
Gene Martinez	Public Interest	Economic Opportunity Board (Water and Sewage Coordinator)
Stan Read	Public Interest	South Valley Area Council (Attorney)
Fred Ward	Public Interest	Black Leadership Council --Kirtland Community Association (Director of the John Marshall Center)
Fred Seebinger	Public Official	County Environmental Planning Commission (Businessman)
Jay Sorenson	Public Official	Water Quality Commission (Professor at UNM)
Wiley Smith	Public Official	City Environmental Planning Commission (Professional Civil Engineer)
Rosa Grado	Private Citizen	South Valley Resident (Social Worker)
Evelyn Oden	Private Citizen	South Valley Resident (Pediatrician)
Douglas Smith	Private Citizen	S.E. Area Citizen (Graduate Student)
Stephen Verchinski	Private Citizen	NE Heights Citizen (Social Security Employee)
Herb Denish	Economic Interest	Denish and Associates Inc. (Consultant)
Ivan Rose	Economic Interest	Kirtland Airforce Base (Professional Civil Engineer)
Walter Webster	Economic Interest	Consulting Engineer's Council (Professional Civil Engineer)
Jim Wiegmann	Economic Interest	University of New Mexico (Budget Director)
John Castillo	Economic Interest	GTE Lenkurt, Inc.

Also, the chairperson of the CAC visited a treatment plant with a wet air oxidation system located in Indio, California.

Various mechanisms to inform and involve the public in the EIS process were included as part of the overall public participation program. These mechanisms, which included public information depositories, mailing lists, public notices, newsletters, public meetings, and the CAC newsletters, are discussed below.

Six public information depositories were established in January 1981 and routinely maintained for public reference. These were:

- Public Library, Main Branch, 501 Copper, N.W. (Downtown),
- Prospect Park Branch Library, 8205 Apache Avenue, N.E.,
- Zimmerman Library, University of New Mexico,
- Esperanza Branch Library, 5600 Esperanza, N.W.,
- Los Griegos Branch Library, 1000 Griegos, N.W., and
- Wastewater Treatment Plant No. 2, 300 North Street, S.W.

Each of these locations provides access to copying facilities. Page 7-3 of the Draft SEIS lists the documents on file at each depository location. In addition, a list of reports available from Sandia National Laboratories (SNL) is filed at each depository. These documents contain further information on sludge irradiation and the SNL Beneficial Uses Program.

An EIS mailing list was compiled of persons expressing an interest in the project. It was continually updated based on specific requests and meeting attendance. At the close of the project, there were 120 persons on the EIS mailing list. These persons received agendas for upcoming meetings, pertinent documents, and meeting minutes upon request. In addition, an expanded mailing list was developed for distribution of newsletters. Newsletters were mailed to a total of 360 interested citizens and organizations. Those receiving newsletters included: (1) everyone on the EIS mailing list; (2) all senior citizen centers and community centers in the city; (3) neighborhood associations that expressed interest in the project; (4) many additional Federal, state, county, and city agencies.

Public notices to inform the public of the project's inception, the formulation of the CAC, the two public meetings, the public hearing and most CAC meetings were published in the Albuquerque Journal, the Albuquerque Tribune, El Hispano, and the New Mexico Independent. In addition, public meetings and the public hearing were advertised in the Pueblo News, a monthly Native American publication.

Meeting notices listed the time and place of the meeting, topics for discussion, and the contact person's name and telephone number. In addition, each notice contained a statement encouraging attendance. Notices were published 30 to 45 days prior to the public meetings and hearings. CAC meeting notices were published ten days prior to the meeting date when possible. Since some of these meetings were scheduled at a late date, notices of these meetings were published the weekend before (at least 3-5 days) the scheduled meeting date. Of all of the meetings in which CAC business was conducted, four meetings, Nos. 9 through 12, were not publicized by legal notices.

Input received from the CAC and the public regarding notices was generally positive; however, one CAC member and one attendee felt that issues were not clearly stated in the notices.

Additional efforts to encourage public participation at public meetings and CAC meetings and to keep the public informed of the progress of the EIS included:

- The Mayor's Weekly Calendar - Distributed to all Departments of the City of Albuquerque.
- Announcements - in the What's Happening column of the Albuquerque Journal and the Tribune's Diversion column.
- Bilingual Fliers - Distributed to libraries/recreation centers and general distribution throughout the City by the public participation staff and CAC members.
- Public Service Announcements - Provided to area radio and television stations.

- Press Releases - Provided to area newspapers and radio and television stations.
- Press Packets - Provided to area newspapers and radio and television stations.

Throughout the EIS process materials were prepared to inform and educate the public and the CAC. The first major documents prepared in conjunction with this Public Participation Program were a public participation workplan and fact sheet. The workplan listed all major activities to be performed throughout the process, the staff assigned to perform the activities, and scheduled completion dates. It should be noted that the schedule remained flexible throughout this program in order to accommodate unforeseen circumstances. The fact sheet included a narrative description of the nature and scope of the project, a list of CAC members, depository locations, consulting engineers, contacts and estimated project costs.

Four CAC members expressed some dissatisfaction with the workplan and/or fact sheet. They felt that the documents were either biased, incomplete, unclear, or schedules not followed.

Materials requested by the CAC were provided as soon as possible by the Water Resources Department, EPA, and/or WAPORA, Inc. In the final evaluation, the majority of the CAC had positive comments on the distribution of materials. However, several CAC members expressed discontent. One member felt that the information provided was biased and incomplete, especially that pertaining to wet-air oxidation and composting. Another stated that the information was confusing. Four of the CAC members stated that information was not provided in a timely manner, and two of them specifically cited EPA as the responsible agency.

Two public meetings and one public hearing were held to provide information on this project and to give the public an opportunity to make comments. In addition, the CAC held 21 meetings (open to the public) to gather information and formulate their recommendations.

A public scoping meeting was held 7 October 1980 at 7:30 p.m. in the City Council Chamber Room of City Hall. The purpose of this meeting was to

provide an opportunity for the public to comment on what should be included within the scope of the SEIS. Four persons provided brief presentations on the background of the project, which were followed by public comments and questions. A record of the meeting was made available in the form of an official transcript. In addition, a responsiveness summary was prepared and distributed to all interested persons.

A public meeting was held on 8 July 1981 at 7:30 p.m. in the Council Chamber Room of City Hall. The purpose of the meeting was to discuss the optimal sludge treatment alternatives available to the City of Albuquerque. Although the agenda provided for a question and answer session, several complaints were received concerning the length of the presentations scheduled prior to the question and answer session. However, all persons who indicated a desire to make a comment were allowed to do so. The record of this meeting was made available in two forms: minutes and a responsiveness summary. Both of these documents were made available to the public.

On 18 November 1981 at 7:00 p.m., a public hearing was held in the Council Chamber Room at City Hall to discuss the Wastewater Treatment Facilities Plan Amendment and the Draft SEIS. A summary of the public hearing is included in Section 6.2 of this Final SEIS. Verbal comments received at the public hearing and EPA's response to these comments are presented in Section 6.4 of this Final SEIS. On request from the CAC, the comment period for this hearing was extended from 23 November until 14 December 1981.

As previously stated, input from CAC members and the general public was obtained through an evaluation checklist distributed at CAC Meeting No. 21. Checklists will remain on file with the City's Public Participation Staff and are available for review.

In general, the CAC checklists reflected a favorable impression of the Public Participation Program. Of the twelve checklists received from CAC members, two were entirely favorable and six were favorable in nearly all areas. The primary concern of these six members related to the timely distribution of information provided to the CAC. Two other CAC members

criticized the materials provided and the balance of interest within the committee as being biased.

Whereas a majority of the CAC members and members of the public provided positive feedback, one person from the audience had several complaints about the Public Participation Program. This person's dissatisfaction was associated with the perceived untimely provision of materials to the CAC and the way in which the meetings were arranged.

Concerning the CAC meetings, the overall tone of the comments received was positive. The primary complaint, as noted by two CAC members and one member of the public, was that the agendas did not always permit public comment. In contrast, another CAC member objected to the public dominating the CAC meetings.

In regards to the public consultations, responses from the checklists indicated general approval. One criticism was the belief that the public felt intimidated by the seating arrangement utilized during the scoping meeting of 7 October 1981. Responses concerning the public meeting of 8 July 1981 suggested briefer presentations consisting of less biased information. Every effort was made to accommodate these concerns in the formulation of subsequent public consultations. As a result, commentators praised the final public consultation -- the public hearing of 18 November 1981.

#### 6.4 RESPONSES TO VERBAL COMMENTS RECEIVED AT THE PUBLIC HEARING

(C = Comment; R = Response)

C1. Pat Lopez

Complained about the current odor. He hopes the City will do something about the odor and not make idle promises.

R1. Comments noted.

C2. Carla Baron

a. She is against sludge irradiation because (1) it is an experimental process, (2) would require the transport and storage of



Cs-137 in Albuquerque, (3) risk of accidents, and (4) long-term effects of exposure to irradiated sludge are unknown.

b. Please elaborate on public health effects of gamma radiation.

R2. a. Comments noted.

b. Information on public health effects of the Cs-137 irradiator is included in Section 6-11 and Appendix 10.2 of the D-SEIS. Additional information on the health effects of gamma radiation in general is included in the following documents which should be available at local libraries:

Government Accounting Office. 1981. Problems in assessing the cancer risks of low-level ionizing radiation exposure EMD-81-1. Washington DC, variously paged.

National Council on Radiation Protection and Measurements. 1975. Review of the current state of radiation protection philosophy. Washington DC, Report No. 43, variously paged.

Upton, Arthur C. 1982. The biological effect of low-level ionizing radiation. Scientific American 246(2):41-49.

C3. Clara Nanninga

a. Concerned about: (1) the effects of whatever alternative is chosen on the people living and working in the Southeast Valley, (2) possible water pollution due to the high water table in the Valley, and (3) the effect of odors on the people close-by as well as the people in the SE Heights and downtown.

b. She did not see any publicity about the meeting, and felt the meeting should be advertised in the newspaper, the radio, and TV.

R3. a. Comments noted.

b. An evaluation of public participation activities (including meeting announcements) is included in Section 6.3 of the Final SEIS.

C4. Rosamund Evans

a. She would like to see the comments of the two cooperating agencies listed in the EIS.

b. The value of the sludge should be weighed against the cost of a disinfection system.

c. The SEIS did not describe the pre-treatment of industrial wastes.

d. The danger of building-up toxics in the soil due to the application of sludge is not addressed in the SEIS.

R4. a. All written comments and responses are provided in Section 6.5 of this Final SEIS.

b. The cost-effectiveness analysis presented on pages 5-44 and 5-45 of the Draft SEIS evaluates the value of sludge (hypothetically set as \$0/ton and \$70/ton) on all alternatives. The effect of the actual value (cost credit) of sludge accepted by EPA is described in the cost-effectiveness analysis presented in Section 3.4 of this document.

c. Pre-treatment for industrial wastes was described in detail in the Facilities Plan Amendment. This discussion was not repeated in the SEIS since the scope of the SEIS is limited to the sludge management system. A copy of the Facilities Plan Amendment is available at the public depositories.

d. The potential of toxic build-up in the soil due to sludge application is discussed on pages 6-15, 6-16, 6-17, 6-18, 6-27, 6-31, and 6-97 of the Draft SEIS.

C5. Evelyn Oden

a. Information on the health effects of the Cs-137 irradiator are scant and should be addressed in more detail.

b. She is concerned about the possibility of the Cs-137 contaminating the groundwater, especially if the irradiator is located at the Plant No. 2 site. A complete analysis of soils, groundwater table, and floodplains for all of the alternative sites should be completed.

c. The Draft SEIS should have compared magnitude and capacity of the Co-60 irradiators and the Cs-137 irradiators.

d. The Draft SEIS said there was no overexposure to workers in the two incidents where the workers entered the room where the source plaque was kept -- what was the exposure? What was the estimate of doses to the workers in the fire incidences in NRC Region 1?

e. The other "time-proven" methods of disinfection (i.e., composting and wet-air oxidation) pose less danger to the people of Albuquerque.

R5. Dr. Oden submitted her comments in writing as well as presented them orally at the public hearing. EPA's responses to her comments are included in Section 6.5 of this Final SEIS.

C6. Gary Socha

Requests that the DOE agree to clean up any spills of Cs-137.

R6. In formal correspondence between the City of Albuquerque Water Resources Department and EPA, the City stated that:

We have discussed the subject of support for any cleanup work with local DOE officials, and have been assured that DOE would take the lead in any accident containment and recovery which might ever be necessary. We will be executing a formal agreement addressing in detail this and other aspects of DOE participation, after final approval of the proposed irradiation system plan.

C7. Bruce Thomson

a. He believes that sludge should continue to be used in a beneficial fashion. Both composting and irradiation would achieve the stated goals, but his personal preference is irradiation because: (1) it is a simpler process, (2) the thoroughness and consistency of disinfection is better, (3) it is safer for the plant operator, and (4) it does not destroy any of the nutritive value of the sludge.

b. He does not believe the disadvantages of trucking were adequately addressed. The number of potential accidents (fatal and non-fatal) and the effects on the existing roads should be addressed.

c. He questions locating the facilities at Montesa Park because of: (1) large capital expenses associated with the pipeline, (2) large O&M expenses associated with the pipeline, and (3) potential failures with the pipeline and pumping stations. A more viable option would be to use funds available for the pipeline to buy land near Plant No. 2 in order to locate the facility at Plant No. 2 and to have extra land set aside for a buffer zone.

d. The EIS does not adequately consider the potential problems associated with O&M. Sludge management options which require sophisticated operations should not be considered and the cost of O&M should be figured into the cost-benefit analysis, if possible.

R7. Dr. Thomson submitted his comments in writing as well as presented them orally at the public hearing. EPA's responses to his comments are included in Section 6.5 of this Final SEIS.

C8. Ken Zook

a. He believes Sandia National Laboratories is looking for beneficial uses for nuclear wastes. Exposure to maintenance workers who

have to service the device is a problem with the irradiator. The SEIS dismisses this exposure as insignificant and no more than background radiation.

b. He does not see that the irradiator deals with the odor problem. There should be more clarity as to how the odor problem will be handled. There is the potential that the odor problem will just be moved to another location.

R8. a. Comments noted.

b. The irradiation of sludge does not affect the potential of the sludge for causing odor. Potential odor problems are discussed in Section 6.4 of the D-SEIS, and additional odor controls which will be included as a result of public comment are presented in Section 3.1 of this Final SEIS.

C9. Rosa Grado

a. She questions the legal disclaimer that appears on the front of Sandia documents which discuss the irradiator. She objects to the irradiator being built since we have so little information on the cost and impacts of the irradiator.

b. She is concerned about psychological effects on the people of Albuquerque resulting from the irradiator.

c. She would like to see the SEIS document the public objection to the irradiator.

d. Not all alternatives were thoroughly evaluated, for example the alternative of using sludge to grow an "energy crop."

e. EPA has not said whether land application of sludge is harmful. She does not want to see sludge, especially if it has been irradiated, put on the parks. She thinks that the City could find an alternative that takes care of the odors but at the same time does not endanger the public.

f. Who is going to pay for the clean-up if there is an accident?

R9. a. Comments noted.

b. Comment noted.

c. All public comments expressed at the public hearing and written to EPA are included in Sections 6.4 and 6.5 of this Final SEIS.

d. The general alternative of non-conventional disposal of sludge via agricultural development is discussed and dismissed on pages 7-122 to 7-127 in the Facilities Plan Amendment (Balloon Report — available at the public depositories). In further discussion of

this alternative, the City justified this dismissal in a letter to the EPA, by stating the following:

Using sludge to help stimulate the production of fuel crops (as well as other useful agricultural by-products) must be seen in context of the overall agricultural environment as discussed on pages 7-103 to 7-114 in the report [the Facilities Plan Amendment]. Even if production of crops which do not compete with the existing local agricultural community is eventually found feasible, any of these schemes will involve major issues of land use and water rights, in common with agricultural schemes based on more conventional cropping. Further, identification of any economically-sound fuel cropping scheme would presumably at once attract private sector investment in the same scheme, likely sooner or later placing the City in the position of competing with local farmers. Any basic policy for the City to embark on an agriculturally-based system would have to be an enactment by the City Council. Given that all available information suggests this disposal technique is neither economic nor dependable in these circumstances, the Water Resources Department could not recommend to the Council that this basic approach be adopted.

e. EPA research determined that land spreading of raw biological sludges potentially is harmful to public health. Thus, Part 257 - "Criteria for Classification of Solid Waste Disposal Facilities and Practices" of the Resource Conservation and Recovery Act established two (2) levels of pathogen destruction (i.e., sludge disinfection) to protect public health. The first level of pathogen kill will be accomplished by the anaerobic digestion facilities proposed by the City. The second, and more thorough level of disinfection will be achieved by the irradiator proposed by the City. The City's proposed project will achieve the level of disinfection required to protect public health, as determined by EPA.

f. See response to Comment No. 6.

C10. Gene Martinez

He does not believe that sufficient consideration was given to the routing of the pipelines to the two dedicated land disposal (DLD) sites. The pipeline will transverse part of the Rio Bravo State Park. How would the pipeline be affected by the force main on Lakeview (going to Lift Station No. 20)? Was research conducted to determine the land ownership patterns in the Pajarito DLD site? It is difficult to get access or clear title to this land without causing undue financial burden on the City.

R10. The Water Resources Department delineated the routes for the transportation of sludge for the various alternatives. Pipeline routes were selected based upon geographic features, availability of existing right-of-way, physical obstructions, and other engineering criteria. The City did assess the real estate situation in general. The City Real Estate Officer advised that, although the City does have right of eminent domain, many landowners would be involved and obtaining clear title to the land would be difficult, time consuming, and expensive, regardless of the route chosen to the DLD sites. This is partially the reason the DLD alternatives were so expensive.

C11. Connie Lopez

She is against the feeding of sludge to cattle which will be slaughtered for human consumption.

R11. Sludge will not be fed to cattle for any purpose. The City's proposed project involves only disposal of sludge by land spreading. See Comment 13.

C12. Kiki Saavedra - State Representative, District 10

His biggest concern is the odor problem. If the sludge is trucked, it should not be routed through a residential area.

R12. Comment noted.

C13. Bill McMullen

It is illegal under the Food and Drug Administration regulations to feed human sewage solids to cattle for human consumption. This procedure can only be done for experimental purposes.

R13. Comment noted.

R14. Bernie Zak

a. The term overexposure means an exposure in excess of government standards.

b. The EIS should be more specific as to how capsules are treated in the irradiator. New capsules will be added when necessary, without the removal of the used capsules.

c. The EIS should make clear that there is an irradiator operating in Germany and South Africa.

d. Data provided to EPA by DOE was not an estimate for the exposure to the workers; rather, it was the record of the radiation exposure

to two workers who were involved in this project. They also were involved in many other projects where they received some radiation exposure. Therefore, it is not fair to say that these levels are predictive of exposures to be expected.

e. The EIS may be unclear about the fact that the additional radiation is a small percentage of the background exposure.

f. The SEIS should address the fact that gamma rays and X-rays are physically the same.

R14. a. Comment noted.

b. Page 5-29 of the Draft SEIS has been amended and is included in Section 5.0 of this Final SEIS.

c. Appendix 10.2 has been amended as presented in Section 5.0 of this Final SEIS.

d. Data used in the EIS for an estimate of radiation exposure to personnel working at the proposed irradiator were taken from a letter dated 7 July 1981 from William H. McMullen of the Department of Energy to Darlene Owsley of EPA, which stated:

It, therefore, appears reasonable to conclude that a person working 40 hours per week at a sludge irradiator designed as conservatively as SIDSS [the Sandia Irradiator for Dried Sewage Solids] would receive less than .05 rem/year of occupationally incurred penetrating radiation exposure ... This adds up to 7 or 8 individuals who might receive up to .05 rem per year each of penetrating radiation.

e. Text in the Final SEIS (page 1-7) provides clarifying statements in response to this comment.

f. Page 6-50 of the Draft SEIS has been amended and is included in Section 5.0 of this Final SEIS.

C15. Paul Robinson

a. The irradiator facility may or may not be applicable for Federal funding since this is a time of change in the construction grants program. The EIS should address the effects of changes in EPA funding on this project.

b. He does not believe the Draft SEIS has the total cost of the full process train for the alternatives. For example, where are the costs of the 3-day stockpile before and after irradiation?

c. The pipeline and trucking alternatives are in the range of \$3 million per year. He does not believe we gain \$3 million worth of reduced odors. There has not been a good analysis of the non-trucking option.

d. The land beside Treatment Plant No. 2 should be considered for the location of these facilities.

e. At least one beneficial use option should have been located somewhere other than Montesa Park.

f. The EIS has not looked at a wide-enough range of alternatives.

R15. a. Various EPA funding scenarios were addressed in Tables 5-15 and 5-16 in the Draft SEIS. Funding applicable due to current regulations is addressed in Section 4.2 of this Final SEIS.

b. The costs of miscellaneous items such as runoff control, stockpile operation, and landscaping were included in a 15% contingency fee added to each process train, and were reflected in the overall capital costs shown in Tables 5-13 and 5-14 in the Draft SEIS.

c. Comment noted.

d. A 60-acre parcel of land located directly north of Plant No. 2 was evaluated as a sludge processing site by the City's consultants, but eliminated due to the high groundwater table and the City's commitments to eliminate odors near the plant site. See Appendix E for additional information concerning site analyses.

e. Comment noted.

f. The scope of the supplemental EIS was established by EPA through consultation with the Water Resources Department and the public.

C16. Kent Zook

Even background radiation is potentially harmful. Additional use and exposure to more radiation is a concern.

R16. Comment noted.

C17. Bernie Zak

The "As Low As Reasonably Achievable" (ALARA) concept of effects of low level radiation as used in the Draft SEIS is the appropriate stance.

R17. Comment noted.

C18. Tim De Young

He would recommend that in the future when preparing an EIS, EPA should try to find people in the area to prepare the EIS.

R18. Comment noted.



C19. Ron Grotbeck

- a. The EIS is deficient because they fail to point out that the only reason for the irradiator is to render the sludge useful as a soil conditioner for the parks of Albuquerque.
- b. The money required is not balanced by the benefit obtained from the use of the sludge as a soil conditioner.
- c. The EIS should extend the expected value of the sludge and balance it against the cost of the irradiator.

R19. a. The purpose of disinfection was described in Section 5.5.6 (page 5-29) of the Draft SEIS.

b. Comment noted.

c. See response to Comment 4.b.

C20. Jack Tills

Has the City considered retro-fitting the existing facility?

R20. The City is proposing all necessary plant improvements and expansions consistent with their approved Facilities Plan. However, upgrading and continuing the existing sludge management system is not allowed by current EPA regulations or recent court stipulations; thus a new sludge management system is needed.

C21. Paul Robinson

It would be better not to block bid the EISs. It would be advantageous to have an Albuquerque bid rather than a Region 6 bid, then more of a New Mexico interest would be involved. Locating a contact in town also would serve to increase communications.

R21. Comments noted.

6.5 RESPONSES TO WRITTEN COMMENTS RECEIVED ON THE DRAFT SEIS

The Draft SEIS on the City of Albuquerque sludge management system was published by EPA on 25 September 1981. The period for receiving written comments on the Draft SEIS was extended by EPA until 14 December 1981. EPA received 23 written letters of comment from the City of Albuquerque, Federal and State agencies, public interest groups, CAC members, and private citizens. Table 6.2 is an index of the comment letters received. These comment letters and EPA's responses to the comments are presented on the following pages.

Table 6-2. Index of public comments.

<u>NO.</u>	<u>DATE OF COMMENT</u>	<u>AGENCY, ORGANIZATION, OR INDIVIDUAL</u>	<u>PAGE</u>
1	19 October 1981	S.E. Reynolds, State Engineer	6-22
2	2 November 1981	New Mexico Citizens for Clean Air and Water	6-23
3	3 November 1981	Larry Caudill, City of Albuquerque	6-25
4	9 November 1981	Department of Housing and Urban Development	6-42
5	9 November 1981	State of New Mexico Environmental Improvement Division	6-43
6	11 November 1981	A.K. Khera, City of Albuquerque	6-45
7	13 November 1981	Department of Transportation	6-53
8	16 November 1981	USDA Soil Conservation Service	6-54
9	16 November 1981	J.B. Sorenson, Chairman CAC	6-56
10	17 November 1981	Evelyn Oden, CAC Member	6-59
11	17 November 1981	James Wiegmann, CAC Member	6-63
12	18 November 1981	Evelyn Oden, CAC Member	6-65
13	19 November 1981	United States Department of the Interior	6-66
14	19 November 1981	Bruce M. Thomson	6-67
15	20 November 1981	Federal Emergency Management Agency	6-71
16	20 November 1981	Department of Health and Human Service	6-72
17	3 December 1981	Citizens Against Nuclear Threats	6-75
18	7 December 1981	Eileen Grevey Clifford, Chairman Water Resources Citizen's Advisory Board	6-76
19	9 December 1981	Fred Seebinger, Gene Martinez, Stan Read, Walt Webster, and Rosa Grado, CAC Members	6-79
20	9 December 1981	Department of the Air Force	6-82
21	10 December 1981	Department of the Air Force	6-84
22	11 December 1981	Vern C. Hagen, Associate/Director Planning	6-86
23	14 December 1981	Stan Read, CAC Member	6-88

PLANNING DIVISION  
(STATE CLEARINGHOUSE)  
MISS  
Review and Comment

DATE: 10-19-81

NOV 14 1981

TO: S.E. Reynolds, State Engineer  
Water Resources Division

FROM: Betsy Reed, Planning Bureau

\$ & A DIVISION

RE: Supplemental DEIS, Wastewater Treatment Facilities, Sludge  
SAI NUMBER PROJECT TITLE Management System, Albuquerque

Planning Division  
LEAD AGENCY

Responses to Comments from S.E. Reynolds,  
State Engineer, Water Resources Division,  
Albuquerque, New Mexico (19 October 1981)

1. Comment noted.

Please review and comment on the above application and return to the sender by 11-19-81

1. Does this plan duplicate any programs which have similar goals and objectives to the proposed application?  
☐ Yes (If yes, please identify these programs.)  
☐ No

Not aware of any.

2. Does the proposed application conform with a comprehensive plan developed for the area in which it is located?  
☐ Not applicable  
☐ Yes  
☐ No (If no, please explain in what way it is not compatible.)

As far as we know.

3. Does the proposed application conflict with any applicable statute, order, rule, or regulation (federal, state or local)?  
☐ Yes (If yes, please cite the conflicting statute, order, rule or regulation.)  
☐ No

Not aware of any.

4. Describe any suggestions or means of improving or strengthening the proposed application.

- ☐ No interest in, or comment on, this project.  
☒ Proposal is supported.  
☐ Proposal is supported with recommendations.  
☐ Proposal is not supported.  
☐ Further information needed, review suspended and applicant notified of request.  
☐ Comments attached.

On the basis of my review, I have indicated my response and/or recommendations above.

Signature of Reviewer

Carl Stiguland  
Staff Engineer

October 22, 1981

Water Resources Division

Date

Agency

Approved July, 1979  
Secretary, DFA

1 - white - to applicant  
1 - yellow - SPD copy  
2 - pink  
1 - lead agency  
1 - review division



# New Mexico Citizens for Clean Air and Water

Box 4694  
3401 Mars Road

Albuquerque, NM 87104-4694

RECEIVED

NOV 2 1981  
S & A DIVISION

Responses to Comments from James V. Lewis  
New Mexico Citizens for Clean Air and Water  
Albuquerque, New Mexico (2 November 1981)

Mr Clinton B. Spotts  
EIS Coordinator, EPA  
1201 Elm St  
Dallas, Texas, 75270

## Comments on SEIS, Albuquerque's Sludge Management

For any long term solution it is absolutely essential that the nutrients in the sludge be utilized. The most cost effective system, alternative 2B, does not do this. Further the cost of alternative 2B is only slightly below (.18%) the cost of an alternative in group 1, Landspread Concept.

Table 2, Alternatives which cause major adverse effects (by discipline), is a very poor way of measuring adverse effects because of the vague nature of the indicated effects. Group 2 should have adverse effects listed under Earth Resources (soil nutrients wasted), Ecological Resources (beneficial soil bacteria are killed), and Land Use (Albuquerque is running out of space for land fill), making 6 adverse effects instead of 3.

1. Comment noted.
2. Table 1-2 was intended to be a general summary of the entire Chapter 6 of the Draft SEIS. For more detailed information on each discipline see Chapter 6 of the Draft SEIS. Loss of the fertilization and soil conditioning characteristic of the sludge was discussed under the DLD option in Section 6.1.3 and has been added to the landfill option under Section 5.2 - Major Corrections on page 5-11 of this Final SEIS. The environmental effects have been altered due to new information from the City and comments from the public, and are presented in Chapter 3.0 of this Final SEIS.

Highly technical solutions such as disinfection with Cesium-137 irradiation are likely to increase in cost and they require extensive shielding and safety measures. There is always the possibility of a spill which would be difficult and dangerous to clean up.

3

Natural processes such as the use of the sun for disinfection and the use of beneficial soil bacteria to turn the sludge into top soil do not go up in cost.

4

Alternative 1F using natural processes and utilizing the sludge nutrients has a cost of only 1.1% more than the calculated most cost effective alternative 2B.

It is also important to check that hospitals, research laboratories and industries are not allowing heavy metals to enter the Albuquerque sewer system.

5

James V. Lewis  
Director, Albuquerque Chapter  
State First Vice Chairman

Responses to Comments from James V. Lewis - Concluded

3. Comment noted.
4. Currently it is not technically or economically feasible to construct a solar disinfection unit. The only solar unit being proposed for this project is a solar greenhouse used for sludge drying.
5. The work task addressed is beyond the scope of the SEIS. However, through its Sewer Ordinance and Pretreatment Program, the City of Albuquerque will make certain that heavy metals discharged by industries are in accordance with Industrial Pretreatment regulations.

## CITY OF ALBUQUERQUE

ALBUQUERQUE, NEW MEXICO

INTER-OFFICE CORRESPONDENCE

November 3, 1981

REF. NO. \_\_\_\_\_

TO: Jay Sorenson, Chairman, Citizens' Advisory Committee

FROM: Larry T. Caudill, CIP Environmentalist, MDD/CIP

SUBJECT: REVIEW/COMMENT ON THE DRAFT S.E.I.S. ON WASTEWATER TREATMENT  
FACILITIES - SLUDGE MANAGEMENT SYSTEM

TRANSMITTAL LETTER. EPA RESPONSE NOT REQUIRED.

As per your request, I am providing copies of my review/comments on the subject draft to you and the Citizens' Advisory Committee.

In my capacity as staff environmentalist, my evaluation consists solely of an objective analysis of the content of the document, and does not consider intentions, promises, or understandings between the cooperating agencies and departments and their consultants. My comments are intended to improve the quality of the draft by eliminating what I perceive to be deficiencies. In attempting to strengthen the document, my hope is that those making recommendations or decisions about alternatives will be doing so with the benefit of all necessary information and after the elimination of ambiguities and uncertainties about precisely what is proposed. General criticisms and recommendations are presented first, followed by very specific items identified by section, page, and paragraph or line number.

My review is provided for the information of the committee members. They may utilize my input to whatever extent they wish in formulating both individual positions and/or a committee position on the draft or in making final recommendations on sludge-handling alternatives. I will be available to the committee the evening of November 11 in order to respond to any questions or concerns you may have about the rationale behind my comments.

LTC/mm

REVIEW & COMMENTS: DRAFT S.E.I.S.  
WASTEWATER TREATMENT FACILITIES SLUDGE MANAGEMENT SYSTEM

Responses to Comments from Larry T. Caudill  
City of Albuquerque  
Albuquerque, New Mexico (3 November 1981)

The Draft S.E.I.S. is deficient in three principal areas:

1. The project is not clearly defined. Lack of information or inconsistencies in what is described prevent a clear understanding of precisely what is proposed, including both hardware and process descriptions. This deficiency makes assessment of impacts difficult and magnifies the ambiguities of proposed mitigative measures.
2. There is inadequate consideration of alternatives, particularly as regards the disinfection/drying/storage site. One disinfection technique, wet air oxidation, was rejected based on improper criteria, since the process described in the draft is not the same as that proposed for Albuquerque.
3. The section on mitigation measures is totally inadequate. Mitigation measures proposed are ill defined and generally phrased in permissive language ("could", "should" or "may"), rather than in directive language ("will", "shall," or "must"). There are no guarantees of what will be done to minimize impacts, hence the nature and magnitude of residual impacts is impossible.

Impacts (-) mitigation = unmitigated impacts or the environmental consequences of the proposed action.

As stated in the draft, the mitigative measures section does not comply with requirements set forth in the CEQ regulations. Specific comments follow, with section, page, paragraph, and line cited as appropriate.

Abstract Page

The U.S.D.A. - Soil Conservation Service is given as a cooperating agency, however there is no indication of participation or input to the draft; particularly in the area of nutrient and trace mineral content of sludge, sludge application rate or nitrogen loading limit per acre treated. S.C.S. input in these areas should be incorporated (40 CFR, Part 1501.6).

1.2 - Summary

(P. 1-4)

Dewatering - Is sludge 3 or 4 or 4.8% solids? There is no mention of odor control at the belt press stage.

1. Based on comments and questions raised during the EIS process the City's proposed alternative has been further defined and is included in Chapter 3.0 of the Final SEIS.
2. The Draft SEIS properly describes the conventional wet air oxidation process which achieves 95% oxidation of organic matter, as well as a substantial volume reduction. The Zimpro process discussed by the CAC during the public participation process is not a wet air oxidation process, rather it is a thermal conditioning process that achieves approximately 5% oxidation in organic matter. Conventional wet air oxidation was screened out for Albuquerque due to high O&M costs, particularly high energy costs. An evaluation of the Zimpro thermal conditioning process was conducted due to a request by the CAC following issuance of the Draft SEIS. This evaluation is included in Section 3.3 of the Final SEIS.
3. Mitigative measures were not included for the 14 alternatives discussed in the Draft SEIS because the City did not propose any. The Draft SEIS assumed the City would only do what is required by Federal and state regulations and local ordinances. A thorough set of mitigative measures have now been included by the City in their currently proposed project, as described in Chapter 3.0 of this Final SEIS. The nature and magnitude of the effects of what the City now proposes, including the mitigative measures they guarantee to undertake, also are described in Chapter 3.0 of this Final SEIS.
4. The SCS provided written comments on the Draft SEIS in November 1981. Their comments and EIA's responses are included in this section of the Final SEIS.
5. Sludge is 4.8% solids when it enters the digester, and digested sludge is 3.0% solids when it leaves the digester; hence the Draft SEIS is correct. Odor control (via enclosed structures) at the belt press stage is now included in the City's proposed project. Refer to Section 3.1 and Figure 3.2 for a complete description of proposed odor control facilities.

Drying - Greenhouse area is not given. There is no mention of odor control at this stage. Duration of air drying, volume present at a given time, and drainage control measures are also not given.

6

Disinfection - Ce 137 source strength/volume should be given as should gamma radiation dosage to which sludge will be exposed. Volume stockpiled, duration of storage, and storage method (covered, open bagged,) should be given.

7

Disposal - The total acreage (1400 +) of lands to be treated should be given. At 7000 tons annually, this would amount to some 5 + tons per acre. The application rate should be jointly determined by S.C.S. and City Parks in order to insure that the application rate projected is appropriate. What "other public lands" would be used for disposal?

8a

8b

### 1.3 - Alternatives to the Proposed Project

(P. 1-5)

No site other than Montesa Park was considered for dewatering drying or disinfection, under group 1 alternatives.

9

### 1.4 - Environmental Consequences of the Alternatives

(P. 1-8)

Environmental consequences of a proposed action cannot be determined without knowledge of the mitigation measures to be implemented as an integral part of the project. To be "currently evaluating mitigation measures that are available" is a poor basis for making conclusions about environmental consequences.

10

### 1.5 - Coordination

(P. 1-10)

While U.S.D.A./S.C.S. agreed to be a cooperating agency, there is no indication that the S.C.S. was involved in any significant way in the preparation of the draft. E.P.A. should provide documentation of S.C.S. input if it occurred.

11

### Responses to Comments from Larry T. Caudill - Continued

6. A full description of the City's proposed project including greenhouse area, duration, volume present, odors and drainage control measures is included in Section 3.1 of the Final SEIS.

7. As stated in the Draft SEIS, the source plaque size for the Cs-137 irradiator would be approximately 15 million curies. The radiation dosage to which the sludge will be exposed would be 1 Mrad. The volume of sludge stockpiled, duration of storage, and storage method is presented in Section 3.1 of the Final SEIS.

8a. The sludge application rates have not been determined. These rates will be determined by the City and will be based on EPA and USDA guidelines and recommendations, and will not exceed state regulations.

8b. The "other public lands" identified in the Facility Plan Amendment to be used for land spreading of sludge included the county parks, UNM golf courses, UNM miscellaneous areas, Valley Gold Dairy, and the US Forest Service Nursery. As was stated in the Draft SEIS on page 5-42, documentation [i.e., letters of intent] that these other entities are willing to purchase sludge or utilize their lands for landspreading activities was not provided to EPA.

9. A summary of the City's evaluation of alternative sites was provided in Table 7-40 of the Facilities Plan Amendment. At the request of EPA and their consultants, a more detailed analysis of alternative sites was submitted in March 1982. This evaluation is included in the Final SEIS in Appendix E.

10. Specific mitigation measures for the City's proposed project are included in Chapter 3 of the Final SEIS.

11. SCS comments are included in this section of the Final SEIS.



3.0 - Introduction

Table 3-1 (P. 3-6)

The list of local environmental controls (ordinances, regulations, court stipulations) is largely incomplete. A list of local environmental ordinances is attached so that this deficiency may be corrected.

12

Chapter 4.0 - Need and Purpose

(P. 4-2), Item #2

Air drying at Montesa Park should be mentioned here for consistency with the project description given in the summary.

13

4.3 - Key Issues

(P. 4-2)

Potential impact on land use and development potential of lands adjacent to Montesa (UNM/State, Kirtland, private) is also a key issue.

14

Chapter 5.0 - Description & Evaluation of Alt.

5.1.2 - (P. 5-2)

A sludge solids concentration of 3% is mentioned in the summary and 4.8% is used here. This inconsistency should be resolved.

15

5.2 - (P. 5-7)

Documentation of the termination date and non-renewability of the lease should be provided. Where will sludge currently being placed there be disposed of on expiration of the lease?

16

5.2 - (P. 5-8) Lines 9-11

Should EPA exercise this authority, what is the penalty range and the projected maximum dollar liability?

17

Table 5-5 - (P. 5-10)

Compatibility with existing land use plans is an evaluation criterion which may render the Montesa Park site "ineligible" for the proposed project; particularly if air drying is used. Alternate sites should have been considered, including Plant #2 and a 20-25 acre site purchase from the State or a private land owner.

18

Responses to Comments from Larry T. Caudill - Continued

12. Table 3-1 on page 3-6 of the Draft SEIS has been corrected and is presented in Chapter 5 of the Final SEIS.
13. More recent information from the City indicates that the 3 acres of open air drying will not be necessary and this change has been reflected in the Summary and Section 3.1 of the Final SEIS.
14. The change has been made to the text as is indicated in Chapter 5.0 of the Final SEIS.
15. See response to Question No. 5.
16. According to the City, the lease expired in January 1982. The City currently is negotiating for a 3-year extension. The City has not submitted a contingency plan to EPA stating what sludge disposal method will be utilized if the lease terminates prior to completion of the proposed Phase II facilities.
17. A civil penalty not to exceed \$10,000 per day of violation can be sought by EPA. If a violation is willful or negligent, the penalty may range from \$2,500 to \$25,000 per day of violation. The Final SEIS incorporates this information in Chapter 5.0.
18. The alternative sites evaluated by the City were included in the Balloon Report. At the request of EPA and their consultants, the City has conducted a more extensive evaluation of alternative sites and this review is included in Appendix E of the Final SEIS.

Table 5-6 - (P. 5-11)

Under "Drying" it isn't clear what Solar-assisted Beds/kilns means, particularly since "solar greenhouses" and "air drying" have been used previously. Under "disinfection" wet air oxidation should be added as an option to be evaluated. "Reduction" should be deleted in order to remain consistent with the chosen sludge disposal option (as per line 14 page 5-9 "The method of ultimate solids disposal usually controls the selection of solids treatment system, and not vice-versa").

Under "Drying" Solar drying is ambiguous since solar greenhouses and air drying in combination has been mentioned previously. Which method(s) has/have been evaluated for cost effectiveness? Under "Disposal to Land" does the cost-effectiveness analysis consider only the 7000 tons to be used on city parks or is the balance of 3740 tons going to the public as well?

Wet Air Oxidation - (P. 5-21)

The process described and evaluated is not the same one described to the C.A.C.; differing in several parameters: 1) oxidation and burning aren't necessarily the same, and 2) the temperatures and pressures shown are much higher. The process was rejected on the basis that these systems are "capital intensive" (operation, maintenance, construction (?)), yet no economic data or analysis is presented. Rejection was also based on an erroneous assumption that incineration was to be the ultimate disposal method. The wet air oxidation process itself cannot be considered incineration according to the definition of incinerator in ABCAQO Regulations - Sec. 2.20 - "Incinerator means any device intended or used for burning waste material to effect a reduction in volume".

The wet air oxidation process should be evaluated on the basis of a correct description and the same level of economic analysis as the rest of the alternatives considered.

5.5.3 - Transportation - (P. 5-25)

Since no site other than Montesa was considered for dewatering, drying, disinfection, and stockpiling, there was no consideration given to alternate pipeline routing. Since they are tied together, both alternate sites and pipeline routing should be considered.

Responses to Comments from Larry T. Caudill - Continued

19a. Table 5-6 presents the preliminary screening of the general options applicable to the Albuquerque sludge management system. At this preliminary stage, general solar-assisted facilities (including beds and kilns) were evaluated. Specifically, a solar greenhouse (a type of solar assisted bed) was chosen for the Albuquerque sludge management system.

19b. As discussed in EPA's response to Question No. 2, conventional wet air oxidation is an option of the reduction component. Heat treatment (e.g., the Zimpro process) has been added to the list of options under the disinfection component.

19c. Reduction is a viable treatment component and is therefore listed in Table 5-6 as having been evaluated during preliminary screening for applicability to the Albuquerque sludge management system. Table 5.8 indicates that reduction is not a required component and it was not selected by Albuquerque for use in any of the optimal alternatives identified in Table 5-10.

20a. For alternatives 1A and 1B a solar greenhouse followed by a 3 acre open air drying area was evaluated and costed. For alternatives 1C, 1D, 1G, and 1H a 6.9 acre open air drying area was evaluated and costed. The cost-effectiveness analysis information is presented in Table 3-5 of the Final SEIS.

20b. The evaluation and cost effectiveness analysis in the Draft SEIS were based on the disposal of all 10,740 tons of sludge to be produced in 1990.

21. The wet air oxidation process described on page 5-21, 5-22, and 5-23 of the Draft SEIS is the conventional wet air oxidation process and is not to be confused with the heat treatment (thermal conditioning) process. The Zimpro firm manufactures both types of systems. For more information on these two systems see EPA's response to Comment No. 2. To avoid confusion the names of the manufacturing firms have been removed from the discussion on wet air oxidation on page 5-21.

22. An evaluation of the thermal conditioning process has been included in Section 3.3 of the Final SEIS.

23. Alternative pipeline and trucking routes were not identified by the City nor evaluated by EPA. An analysis of alternative sites provided by the City is included in Appendix E of the Final SEIS.

5.5.4. - Dewatering (P. 5-28)

Regardless of which option (belt or filter press is selected the draft should state that the unit will be enclosed and that gases (odors) will be scrubbed.

24

5.5.5. Secondary Drying - (P. 5-28)

The use of solar greenhouses and open air drying is implied, but no clear selection is made. The combination "can dry to 40% in 6 days" - but will it?

25

Two 40' X 120' open air drying areas are to be located in each of three greenhouses (6 total?)... "Open air drying" versus "in greenhouses" is contradictory. These inconsistencies should be resolved.

26

5.5.6 - Disinfection - (P. 5-29 to 5-32)

- While a complete description of the irradiator is given in the appendices (10.2) this information is not referenced.

27

- D.O.E. responsibility for clean-up and decontamination is not stated, contrary to an earlier C.A.C. recommendation.

28

- The description of electron beam irradiation in appendix 10-2 is not referenced.

29

- Composting is described briefly, but is not given equal attention in terms of an appendix description.

30

- Ditto re: wet air oxidation

31

- Failure to consider a discrete 20-25 acre site on City, State, or private land for all disinfection processes (ie. for everything proposed) is again noted.

32

- Quantification is given for volumes (cu. yards) but not in area required. This disparity makes comparison of the areas required (and surface exposed) difficult. Area required for all three options + wet air oxidation should be given.

33

Responses to Comments from Larry T. Caudill - Continued

24. Since the Draft SEIS was issued, the City has proposed odor scrubbing equipment for all air exhausted to the atmosphere from the wet sludge processing facility. This revision to the project has been included in Section 3.1 of the Final SEIS.

25. In the Draft SEIS the proposed drying option was a solar greenhouse with 3 acres of open air drying. More detailed design for the solar greenhouse has indicated that the 3 acres of open air drying will not be a necessary addition to the solar greenhouse option for drying the sludge to 40% solids. The exact time for drying to occur is highly dependent on ambient weather conditions which exist at the particular time.

26. As described on page 5-28 of the Draft SEIS, there will be six drying areas (two in each of the three greenhouses). The phrasing on page 5-28 has been changed to further clarify open air drying versus greenhouse drying.

27. As indicated in Section 5.2 of the Final SEIS, this reference has been included on page 5-29 of the Draft SEIS.

28. This information was made available to EPA after the Draft SEIS was issued. The text on page 5-29 of the Draft SEIS has been changed to reflect this comment.

29. Page 5-29 of the Draft SEIS, has been corrected to include this reference.

30. Due to CEQ recommended length restrictions (150 pages) an in-depth description of all options is not feasible. A detailed description of Cesium-137 irradiation and electron beam irradiation was included in the Appendix since they both involve radiation which was a key issue in this SEIS. Additional information on composting was provided in the City's amended facilities plan (i.e., Balloon Report).

31. See EPA's response to Question No. 30. A two page description on page 5-21 and 5-22 of the Draft SEIS was considered adequate to describe wet air oxidation.

32. See EPA's response to Question No. 18.

33. The area required for all three disinfection options and thermal conditioning are given below.

Process Component	Approximate Land Area	
	Square Feet	Acres
Composting	192,000	4.4
Gamma Ray Irradiation	5,000	0.1
Electron Beam Irradiation	4,500	0.1
Thermal Conditioning	4,000	0.1

5.5.7 - Disposal - (P. 5-32 to 5-34)

- Stockpiling at Montesa "... until the Parks Department could pick it up..." is an ill-defined time frame, and could be as long as 10 months.
- If it is to be picked up periodically and stored elsewhere for February - March application, then the effects of dust, odor and land use impact for site "X" must be considered.
- The economic analysis for landspreading options (Group 1A-H) should consider the costs of handling and application; alternately a rationale for not considering them should be presented.

Unanswered questions include:

1. If sludge can be dried from 25% to 40% in 6 days, why will sludge remain in the drying beds 140-150 days to attain the same 40% solids?
2. If air drying only were used, what would drying time be from 25% to 40% solids?
3. What would be the health effects on workers tilling 6.9 acres of undisinfected sludge daily for 150 days or more?
4. Will greenhouse exhaust gases be scrubbed for odor control?
5. What provisions are to be made for drainage/leachate disposal from a drying floor of either 3 or 6.9 acres?
6. The area of drying beds at Plant #2 is 508,000 ft.(sq.) (11.5 acres). What is the potential odor problem or odor control needed for 6.9 acres of beds located at Montesa?

Figure 5-3 - Site Map of Montesa Park

The drawing is not in agreement with the preceding description:

1. No paved drying area is noted or depicted.

Responses to Comments from Larry T. Caudill - Continued

34. According to information provided by the City since issuance of the Draft SEIS, after disinfection the sludge will be stockpiled in an enclosed building which has the capacity to store 6 months of sludge, although in normal operation detention in the stockpiles prior to movement to the parks would average closer to 4 months. In only rare cases would the actual stored volume in most years ever exceed 8,000 cubic yards.
35. The temporary storage of sludge at individual parks may be occasionally necessary while awaiting optimal conditions for spreading. Due to the diverse locations of the City parks, the effects of the temporary storage at City parks is out-of-scope for this SEIS.
36. If sludge is applied to parks, it must be stored, picked up, hauled, and spread. If sludge is disposed by landfill or DLD, commercial fertilizer for the parks must be stored, picked up, hauled, and spread. EPA determined this cost was common to all alternatives; thus, components and associated cost for all Group 1 alternatives were taken free on board (F.O.B.) Montesa Park.
37. Misleading wording on page 5-29 has been corrected.
38. The drying time necessary for open air drying alone was not provided by the City. However, it has been determined that open air drying is not an acceptable option for the City of Albuquerque.
39. The purpose of Section 5.5 of the Draft SEIS was to describe the component option and not to present impacts such as health effects. Environmental consequences of the alternatives were discussed in Chapter 6.0. Health effects from the various component options were discussed in Section 6.11.3 of the Draft SEIS.
40. Yes.
41. Since open air drying is not environmentally sound for the City of Albuquerque, leachate control measures are not required.
42. Open air drying was found to be not environmentally sound.
43. The drying area is part of the stockpile beds depicted. Figure 5-3, 5-4, and 5-5 are of poor quality and lack some detail. A better site layout map is included as Figure 3-2 in the Final SEIS.

2. No drainage system is noted or depicted.
3. No direct access between the irradiator and the rest of the facilities is shown.
4. The limits of both 100 and 500 year flood hazard areas should be clearly depicted and shown relative to the location of all facilities.

The irradiator is shown located between two access roads. The non-contiguous site ~~seems~~ inappropriate both for reasons of accessibility and site security.

Table 5-11 - (P. 5-35 & 5-36)

Significant Characteristics for certain components should be expanded upon as follows:

<u>Component</u>	<u>Option</u>	<u>Significant Characteristic</u>
Conditioning	Polymer	Cost tied to energy (oil) prices
Transportation	Pipeline	Arroyo instead of river crossing
Dewatering	F, & B, Press	Odor production (Unless enclosed and odors scrubbed)
Drying	S. Greenhouse	Exhaust gases scrubbed for odor control
	Open Air	w/6.9 acres & daily tilling, effects would seem similar to those given for composting, including bird strike hazard.

Table 5-6 - (P. 5-39)

- Items 1 & 2 do not indicate duration or volume stored, nor are drainage controls included.
- Odor controls at belt press and greenhouse drying stages are not shown.

5.7 Cost Effectiveness Analysis

(P. 5-42) - lines 9-12

The \$70 figure for sludge value is given, but no documentation provided. The city letters mentioned here and in the following paragraph should be included

Responses to Comments from Larry T. Caudill - Continued

44. See EPA's response to Question No. 43.
45. See EPA's response to Question No. 43.
46. The 100-year floodplain was shown (poor quality) in Figures 5-3, 5-4, and 5-5. EPA has no requirement or regulation concerning the 500-year floodplain.
47. See EPA's response to Question No. 43.
48. Table 5-11 has been changed to reflect this comment.
49. Figure 5-6 is schematic in nature and is not intended to indicate physical characteristics or design criteria for any of the processes. Areal extent and height of the stockpile enclosing structures and the duration time are included in Section 3.1 of the Final SEIS.
50. See EPA's response to Question No. 49.
51. EPA's decision concerning the credit for sludge is described in Section 4.1 of the Final SEIS.

in the appendix. The validity of the \$70/ton figure should be determined by a third party such as the S.C.S. Other entities are mentioned as potential users, but again no documentation is provided. Lacking documentation, use on these other public lands cannot be realistically considered an option.

52

Market value appears to be a more appropriate means of determining the worth of sludge, as opposed to a \$70 figure which is undocumented in the draft.

53

Tables 5-13 to 5-17 (P. 5-44 to 5-48)

An economic analysis should be provided for the wet air oxidation process, just as for all other alternative disinfection/disposal methods.

54

#### Chapter 6 - Environmental Consequences

The format used in this section is both cumbersome and confusing. Instead of taking each component of each action alternative through an impact analysis for each of thirteen (13) parameters; analysis of each discrete alternative "package" is recommended.

55

#### 6.1.2 - Action Alternatives:

##### Drying - Open Air Drying (p. 6-15)

Odor problems have been mentioned previously but do not appear here. The asphalt drying area and the addition of a drainage system will prevent the leachate/run-off problem mentioned here. There would be some potential health effects from the daily tilling operation.

56

##### Disposal - Landspreading (P. 6-15)

Application rate should be determined by the outcome of an ongoing research project and the input of S.C.S. as to what uptake rates are and what heavy metal accumulations can be expected in soils.

57

While sludge has some benefit as a soil conditioner, the texture and moisture holding improvements envisioned for sludge can occur only if it is mixed into the soil as a soil amendment. Use as a top dressing only will largely restrict beneficial effects to the nutrients and trace minerals that are leached from the surface and percolate to root depth.

58

#### Responses to Comments from Larry T. Caudill - Continued

52. The City did not provide letters of intent from other entities. A preliminary market survey containing information on potential sludge users and buyers is contained in Appendix F of this Final EIS.

53. See EPA's response to Comment 51.

54. Thermal conditioning is discussed in Section 3.3 of the Final SEIS.

55. Comment noted.

56. The section this comment refers to is titled "Earth Resources" and therefore a discussion of odors and health effects would be inappropriate in this section. Odor problems and health effects are discussed in Section 6.4 and 6.11, respectively.

57. Sludge application rates will be established in accordance with EPA and USDA guidelines and recommendations.

58. The text on page 6-16 of the Draft SEIS has been changed to reflect this comment.

Transportation - Pipeline (P. 6-18)

The Draft does not address the impact of a pipeline break at the So. Diversion Channel or Tijeras Arroyo Crossings, and resulting flow of an undetermined amount of sludge into the drainageways. The pipeline should be equipped with check valves "upstream" of both crossings to prevent drainage of the sludge in the line above the break.

59

Floodplains (P. 6-22)

Latest N.F.I.P. flood hazard mapping should be used to establish 100 year and 500 year flood hazard areas/lines in Tijeras arroyo, and particularly through the proposed site in Montesa Park.

60

6.3 Groundwater Resources

Drying (P. 6-30)

Leachated and runoff will not reach the soil if the aforementioned drainage system (return to Tijeras interceptor?) is defined as a part of the project.

61

Transportation (P. 6-30)

Check or safety valves can be added at appropriate locations to prevent leakage from a ruptured line from flowing into low areas or drainageways.

62

Disposal (P. 6-31)

Safe application levels/locations should be determined with the assistance/input of the S.C.S.

63

6.4 Air Quality and Ambient Noise Level\* (Word Change)

Ambient Air Quality (P. 6-33)

The particulate AQ parameter could be adversely affected by dust and traffic associated with soil disturbance and construction. This short-term impact can be moderated by compliance with provisions of the Topsoil Disturbance Permit which will be required under ABCAQCB regulations

64

Responses to Comments from Larry T. Caudill - Continued

59. The effect of potential breaks or leaks in the pipeline are acknowledged in Section 6.1 (page 6-18) and Section 6.2 (page 6-27) of the Draft SEIS. EPA will review and verify the specific engineering design necessary to lessen the potential effects of pipeline breaks during the review of the City's engineering plans and specifications, prior to award of a construction grant.
60. The latest publicly available floodplain maps were used to establish the 100-year floodplains. The floodplain maps are currently being up-dated but these maps are not available for publication (by phone, Diane Leatherwood, Federal Emergency Management Agency, 8 February 1982). The inclusion of the 500-year floodplain hazard area is not required by EPA.
61. Comment noted.
62. Comment noted.
63. See EPA's response to Question No. 57.
64. This information was already included in the Air Quality Section of the Draft SEIS on pages 6-38 and 6-47.

Regulations (P. 6-38)

"Group" should be changed to "Division". The 3/4 acre threshold applies to any area disturbed including pipeline R.O.W. and construction site at Montesa. Particulate controls would apply both during construction and operation of the facility, landfill or otherwise.

65

Odor (P. 6-41)

Belt presses should also be considered a potential odor source. Of those mentioned, two (belt presses and greenhouses) can be or are enclosed and should have odors scrubbed. Odors from open air drying and sludge stockpiles are still a potential problem. Enclosed stockpiles or bagged sludge could not be re-hydrated and therefore is less likely to be an odor source; however the precise storage/stockpile method is not defined.

66

Table 6-7 (P.6-42)

Again, both greenhouse and open air drying are shown but no determination is made as to which method (or combination) will be used. If open air drying for 150 days (with daily tilling) is used, then it would seem that there would be health effects similar to those postulated for composting (i.e. Aspergillus fumigatus). Wet air oxidation should be added to the alternative disinfection methods being considered.

67a

67b

67c

Stockpiling of Sludge (P. 6-45)

The storage method, size/volume of storage area/building, drainage system (if any) and duration of sludge storage must be defined before any realistic assessment of odor dust, etc., can be undertaken. This applies to all group 1 alternatives.

68

(P. 6-49), Paragraph 2 & 4

Ambiguity and lack of project definition continue to make determination of magnitude of the problem difficult.

69

6.5 Biological Resources

Table 6-12 - (P. 6-60)

Bird strike hazard has been previously mentioned as a concern. The input from the Air Force BASH team should be factored into this section.

70

Responses to Comments from Larry T. Caudill - Continued

65. The text has been changed to reflect this comment.

66. On page 6-42 of the Draft SEIS, belt presses were identified as a source of minor odors. Since the Draft SEIS was issued, the City has made revisions to the proposed project which include installing odor scrubbing equipment for all air exhausted to the atmosphere from the wet sludge processing facility. Alternatives with open air drying have been removed from further consideration and all stockpiles have been enclosed. These revisions are discussed in Section 3.1 of the Final SEIS.

67a. See EPA's response to Comment No. 25.

67b. Health effects were discussed in Section 6.11 of the Draft SEIS.

67c. See EPA's response to Comment No. 2. An evaluation of the effects of wet air oxidation has been included in Section 3.3 of the Final SEIS.

68. More detailed information on the topics mentioned in this comment has been provided by the City since issuance of the Draft SEIS. This information has been included in Section 3.1 of the Final SEIS. The environmental effects of the alternatives have been reevaluated based on these new revisions and are included in Section 3.3 of the Final SEIS.

69. Comment noted.

70. The Bird Aircraft Strike Hazard (BASH) report prepared by the US Air Force expressed concern about the attraction of birds to lagoons at Montesa Park. Although the City did at one time propose using sludge lagoons as an interim measure, none of the alternatives for ultimate treatment and disposal of sludge as evaluated in the Draft SEIS proposed the use of lagoons at Montesa Park. At CAC Meeting 17, a member of the Air Force BASH team expressed concern about the attraction of birds to open air drying beds. Since issuance of the Draft SEIS, the City has made certain changes which include: (1) deleting open air drying from consideration due to being not environmentally sound; and (2) enclosing all stockpiles. These changes should alleviate concerns over the attraction of birds to the proposed sludge handling facilities.



6.6 Cultural Resources

6.6.1. - (P. 6-64)

The draft indicates a need to reevaluate effects on cultural resources, particularly as determined by transportation and disposal. Depending on the site, the dewatering, drying, disinfection, and stockpiling components could also impact cultural resources. Consideration of cultural/social impacts should not be restricted to transportation and disposal only.

71

6.7 Population

No comment.

6.8 Land Use and Transportation

6.8.1. - (P. 6-73)

(Par. 1) The proposed development was not approved by the Environmental Planning Commission. This decision was appealed by the developer, and the appeal was denied by the City Council on October 26, 1981.

72

(Par. 2) Montesa Park was zoned M-2 until August 21, 1980, when a Water Resources Department request for a zone change to SU-1 was approved, subject to certain findings (copy attached).

73

(Par. 3) As mentioned previously, 100-Year and 500-Year Flood Plain lines should be shown on pertinent graphics in the draft, particularly with reference to the location of proposed facilities.

74

6.8.3. Environmental Consequences - (P. 6-75)

(Par. 4) Information presented on bird air strike hazards is not consistent with that provided to the CAC. This portion should be revised to include the input of the Air Force BASH team.

75

Depending on which of multiple possibilities for the type of facilities to be located at Montesa is selected, there may be adverse affects on land use and the land values for adjacent properties. Potential effects cannot be addressed until a clear definition of the proposed project is made, i.e., open or enclosed dewatering; greenhouse or open air drying or a combination thereof; odor controls, if any; and area, method and duration of stockpiling, etc.

76

Responses to Comments from Larry T. Caudill - Continued

71. EPA and the State Historic Preservation Office (SHPO) have determined that there will be no significant impact on cultural resources caused by the proposed project. If any other alternative is chosen, EPA will require the City to coordinate with the SHPO to protect cultural resources in accordance with the National Historic Preservation Act of 1966, and Advisory Council Procedures (36 CFR 800).
72. The text in the Draft SEIS has been changed to reflect this comment.
73. The text in the Draft SEIS has been changed to reflect this comment.
74. The 100-year floodplain boundary is presented in Figures 5-3, 5-4, and 5-5. The quality of these graphics is poor therefore the 100-year flood boundary is difficult to distinguish. Presentation of the 500-year flood hazard area is not required by EPA.
75. See EPA's response to Comment No. 70.
76. See Chapters 3 and 4 of the Final SEIS for a description of the proposed project.

6.9 Economics

6.9.3. - (P. 6-81)

The impact on land values will be largely determined by the type of facilities constructed at Montesa and the degree to which odors, dust, and aesthetic impact are controlled by the city.

77

Employment - (P. 6-83)

If adverse affects on the local fertilizer industry is postulated as a consequence of landspreading on city parks, then it should be documented. It is doubtful that the city's action alone would have much impact on the fertilizer industry one way or another.

78

Polymer costs are related oil/energy costs and should be factored into the energy analysis.

79

6.11 Environmental Health

Open Air Drying - (P. 6-93)

As previously mentioned, a detention time of 150 days and daily tilling would appear to pose hazards similar to those indicated for composting (Aspergillus fumigatus). Control of leachates and runoff is again mentioned, but is not a firm part of the project description.

80

Solar Greenhouse Drying - (P. 6-93)

Release of odors and pathogenic aerosols is mentioned. Filtration or scrubbing of these emissions has been alluded to, but is not clearly a part of the project description.

81

- The wet air oxidation alternative is not addressed.

82

Stockpiling of Sludge - (P. 6-96 to 6-97)

Stockpiling on a concrete floor with 8' walls has been mentioned previously, but no such controls are considered here. Instead, stockpiles are 'typically placed only on a bed of compacted earth,' creating problems with drainage and runoff. Again, the whole stockpiling question needs resolution.

83

- Additional stockpile locations are mentioned for the first time, yet number, location, storage volume, or duration of storage is not discussed.

84

Responses to Comments from Larry T. Caudill - Continued

77. Comment noted.

78. The text in the Draft SEIS has been changed to reflect this comment.

79. An increase of 3% per year for land and 4% per year for natural gas was included in the cost-effectiveness analysis as required by EPA regulation. Increases in prices for other materials or inflation specifically are not allowed by EPA regulation.

80. Open air drying has been determined environmentally unacceptable. Control of leachate and runoff was not clearly addressed in the City's proposed project as presented in the Facilities Plan Amendment, but has been included in Section 3.1 of the Final SEIS.

81. Exhaust gases associated with solar greenhouse drying will be scrubbed. See Section 3.1 of the Final SEIS.

82. See EPA's response to Question No. 2. At the request of the CAC, a fifteenth alternative, which includes thermal conditioning, has been evaluated in the Final SEIS in Section 3.3.

83. The proposed project as presented in the Draft SEIS was to have the final stockpile on a concrete floor with eight foot walls. The other stockpiles would be placed on a bed of compacted earth in an unenclosed area. Revisions made since issuance of the Draft SEIS include enclosing all stockpiles and placing them on an asphalt floor. A discussion of the revisions made since the Draft SEIS was issued is included in Section 3.1 of the Final SEIS.

84. See EPA's response to Comment No. 35 and Comment No. 49.

- There is no discussion of the potential odors or associated problems at these scattered and unknown locations.
- Unless stockpiles are covered, re-hydration, re-infection, and "new" odors can result.

85

86

#### 6.12 Recreation and Aesthetics

##### 6.12.1. Existing conditions - (P. 6-98 to 6-100)

There is a city parks motorcycle course immediately to the West, as designated by the Open Space Management Plan. Hills on the South side of Tijeras Arroyo are commonly used for hanggliding. These recreational uses of the land may be impacted, so this issue should be addressed.

87

##### 6.12.3. Environmental Consequences

Several improvements (10' chainlink fence, 8' walls, "careful building design, layout, landscaping," and a "possible wooded buffer zone" are mentioned as potential aesthetic improvements or mitigation measures. However, none of these measures can be considered as such unless assured by firm project definition/design and set forth as guarantees in the Mitigation Section of the draft. As phrased here they are simply too ambiguous.

88

##### 6.15 Mitigative Measures

The mitigation measures section of the draft is totally inadequate. Specific deficiencies, inconsistencies, and departures from the requirements set forth in 40 CFR, Parts 1500-1508, are presented below.

According to CEQ regulations (40 CFR 1502.16), this section requires that . . . "the discussion will include the environmental impacts of the alternatives including the proposed action, any adverse environmental effects which cannot be avoided should the proposal be implemented. . . . Further, it shall include (h) 'Means to mitigate adverse impacts (if not fully covered under 1502.14 (f)).

89

While mitigative measures were discussed they were, with one exception, focused entirely in permissive rather than directive language.

#### Responses to Comments from Larry T. Caudill - Continued

85. See EPA's response to Question No. 35.

86. Since the Draft SEIS was issued, the City has submitted revisions to EPA which include enclosing all stockpiles.

87. The Draft SEIS acknowledges the recreational use of the area surrounding Montesa Park for off-road vehicles. The text has been changed to include hang gliding. Impacts of recreational use of the land were addressed in Section 6.12.3 of the Draft SEIS, and are addressed in Sections 3.2 and 3.3 of the Final SEIS.

88. Revisions to the proposed project made since issuance of the Draft SEIS include more specific mitigative measures. These revisions are presented in Section 3.1 of the Final SEIS.

89. The proposed project, alternatives, mitigative measures to be included, short/long-term effects, irreversible effects, and effects which cannot be mitigated are discussed in Chapter 3.0 of the Final SEIS.

CEQ regulations include provisions whereby mitigation may be assured:

1502.2 Record of Decision in Cases Requiring EIS's

(c) State whether all practicable means to avoid or minimize environmental harm from the alternative selected have been adopted, and if not, why not. A monitoring and enforcement program shall be adopted and summarized where applicable for any mitigation.

This mechanism is not referenced in the draft, nor does EPA state its intentions regarding monitoring.

1505.2 Implementing the Decision

. . . mitigation 1505.2(c) and other conditions established in the environmental impact statement or during its review and committed as part of the decision shall be implemented by the lead agency or other appropriate consenting agency. The lead agency shall:

- (a) Include appropriate conditions in grants, permits, or other approvals.
- (b) Condition funding of actions on mitigation.
- (c) Upon request, inform cooperating or commenting agencies on progress in carrying out mitigation measures which they have proposed and which are adopted by the agency making the decision.
- (d) Upon request, make available to the public the results of relevant monitoring.

Suggested mitigation measures include:

- 1. Require compliance with local environmental ordinances.
- 2. Include said list in design and construction contracts.
- 3. Include mitigation measures set forth in the Record of Decision/Final SEIS/grant documents in design and construction contracts.
- 4. Require that construction contractors obtain a topsoil disturbance permit specifying dust control measures.
- 5. Rephrasing of soil disturbance/erosion related measures so that they are directive rather than permissively phrased.
- 6. Incorporate odor controls on enclosed operations as a required mitigation measure.

Responses to Comments from Larry T. Caudill - Concluded

90. A Record of Decision will be prepared after the expiration of the 30-day review period on the Final SEIS. Accordingly, monitoring requirements and/or other grant provisions applicable to the proposed project will be included at the time of the construction grant award.

91. Suggestions appreciated. See EPA's response to Comment 90.

7. Incorporate a drainage system into the project design in order to address the potential adverse effects of leachates and runoff.
8. Incorporate check or backflow-preventer valves at initial locations, drainageway crossings, and at low points in the pipeline.
9. Specify enclosed/covered/bagging of sludge to minimize impacts from stockpiling.
10. Stipulate that DOE will be responsible for any clean-up decontamination operations in the event of a spill or leakage of radioactive material.
11. Specify that landscaping of the site will be accomplished as an integral part of the project in order to minimize aesthetic impact.

91

ATTACHMENTS TO LETTER FROM LARRY CAUDILL

PROVIDED ON FOLLOWING PAGE

SECTION 7. ENVIRONMENTAL ORDINANCES AND REGULATIONS:

The following is a partial list of environmental ordinances and regulations applicable to the work under this contract. This list is provided for the Contractor's information and the Contractor should not consider this list to be a complete listing of all ordinances and regulations which are applicable to this project.

ORDINANCES

CHAPTER 6 - HEALTH, SAFETY AND SANITATION

ARTICLE I	<u>Air Pollution Control.</u>
ARTICLE III	<u>Refuse Collection.</u>
ARTICLE VIII	<u>Litter.</u>
ARTICLE XV	<u>Weed Control</u>
ARTICLE XVI	<u>Joint Air Quality Control Board.</u>
ARTICLE XVIII	<u>Insect and Rodent Control.</u>
ARTICLE XXII	<u>Noise Control.</u>

CHAPTER 7 - ZONING, PLANNING AND BUILDING

ARTICLE V	<u>Landmarks and Urban Conservation.</u>
ARTICLE XIX	<u>Flood Hazard Area Zoning.</u>
ARTICLE XXIII	<u>Uniform Administrative Code and Technical Codes.</u>

CHAPTER 8 - WATER, SEWER, AND STREETS

ARTICLE IV	<u>Water and Sewer Rates.</u>
ARTICLE VI	<u>Sidewalks.</u>
ARTICLE VII	<u>Street Excavation.</u>
ARTICLE XVI	<u>Water Waste.</u>

All ordinance citations are to the Revised Ordinances of Albuquerque, New Mexico, 1974. Copies of ordinances may be obtained from the City Clerk/Recorder.

REGULATIONS

Albuquerque/Bernalillo County Air Pollution Control Regulations (May 1973, as amended).

DATE: August 20, 1980

NOTIFICATION OF DECISION  
Z-80-66

File: A tract of land  
Location: situated within  
Sections 10, 11, & 15,  
T9N, R3E

✓ Paul Brasher, Water Resources  
P. O. Box 1293  
Albuquerque, New Mexico 87103

On August 21, 1980, the Environmental Planning Commission approved the above request thereby changing the zoning to SU-1 (Special Use for Sludge Treatment Facility) subject to the following Findings:

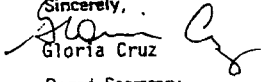
1. SU-1 for Sludge Treatment Facilities at Montesa Park is not inappropriate.
2. The final design and type of treatment has not yet been determined.
3. Prior to construction a detailed site development plan is required for review by this Commission.
4. Notification will be given to all surrounding land owners regardless of distance from the property, including all parties that will be sensitive to this facility, i.e., University of New Mexico, Kirtland Air Force Base, etc. These parties shall be provided with a copy of the site development plan prior to the public hearing to approve this plan and their comments shall be requested.

If you wish to appeal this decision, you must do so by 9-5-80 in the manner described below. A non-refundable filing fee of \$40 is required at the time the appeal is filed.

Appeal to the City Council. Any person aggrieved with any determination of the Environmental Planning Commission acting under this ordinance may file an appeal to the City Council by submitting written application on the Planning Division form to the Planning Division within 15 days of the Planning Commission's decision. The date the determination in question is issued is not included in the 15-day period for filing an appeal, and if the fifteenth day falls on a Saturday, Sunday or holiday as listed in the Merit System Ordinance, the next working day is considered as the deadline for filing the appeal. The City Council may decline to hear the appeal if it finds that all City plans, policies and ordinances have been properly followed. If it decides that all City plans, policies and ordinances have not been properly followed, it shall hear the appeal. Such appeal, if heard, shall be heard within 60 days of its filing.

You will receive notice if any other person files an appeal. If there is no appeal you can receive building permits any time after the appeal deadline quoted above provided all conditions imposed at the time of approval have been met. Successful applicants are reminded that other regulations of the City must be complied with, even after approval of the referenced application(s).

IF YOU RECEIVE APPROVAL FOR ANY REQUEST WHICH REQUIRES A SITE DEVELOPMENT PLAN, SEE ATTACHED SHEET FOR FURTHER INFORMATION.

Sincerely,  
  
Gloria Cruz  
Board Secretary

gc  
cc Bill J. Howard, Airports District Office, 2930 Yale S.E. 109A; 87106  
Judy Epstein, P. O. Box 13611; 87198  
Advice



REGION VI

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT  
FORT WORTH REGIONAL OFFICE  
221 WEST LANCASTER AVENUE  
P.O. BOX 2905  
FORT WORTH, TEXAS 76113

IN REPLY REFER TO:

November 9, 1981

Mr. Clinton B. Spotts  
Regional EIS Coordinator  
U.S. Environmental Protection Agency  
1201 Elm Street  
Dallas, Texas 75270

Dear Mr. Spotts:

The Draft Supplemental Environmental Impact Statement for Waste-water Treatment Facilities, Sludge Management System, Albuquerque, New Mexico, has been reviewed in the Department of Housing and Urban Development's Little Rock Area Office and Fort Worth Regional Office. The Department's comment follows:

The text on Ambient Air Quality, 6.4.1, page 6-33, does not correspond to Figure 6-4. In the text all of Bernalillo County is nonattainment for carbon monoxide which is not indicated on the figure. The figure shows the entire county as nonattainment for photochemical oxidants or ozone while the text states only portions of the county is nonattainment area.

Sincerely,

*Victor J. Hancock*  
Victor J. Hancock  
Environmental Clearance Officer

RECEIVED

NOV 10 1981

S & A DIVISION

Responses to Comments from Victor J. Hancock  
Department of Housing and Urban Development, Fort Worth Regional Office  
Fort Worth, Texas (9 November 1981)

1. The text on Ambient Air Quality (Section 6.4.1) on page 6-33 corresponds exactly with Figure 6-4 on page 6-37. As indicated by the title, Figure 6-4 shows only part of Bernalillo County and not the entire county. The figure shows a portion of the county as nonattainment for ozone, and only 5 distinct areas as nonattainment for particulate matter, both of which are consistent with the text. The legend of Figure 6-4 indicates all of Bernalillo County is nonattainment for carbon monoxide, which also is consistent with the text.

1

6-42



**STATE OF NEW MEXICO**  
ENVIRONMENTAL IMPROVEMENT DIVISION  
P.O. Box 968, Santa Fe, New Mexico 87503  
(505) 827-5271  
Thomas E. Baca, M.P.H., Director

Bruce King  
GOVERNOR

George S. Goldstein, Ph.D.  
SECRETARY

Larry J. Gordon, M.S., M.P.H.  
DEPUTY SECRETARY

Response to Comments from Mr. Ed Stokes, P.E.  
The State of New Mexico, Environmental Improvement Division  
Santa Fe, New Mexico (9 November 1981)

November 9, 1981

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S & A DIVISION

Mr. Clinton Spotts  
EPA - Region VI  
First International Building  
1201 Elm Street  
Dallas, Texas 75270

Re: Supplemental Draft of EIS. Wastewater Treatment Facilities-  
Sludge Management System: Albuquerque, NM.

Dear Mr. Spotts:

The following are my comments on the referenced document:

1. Page 1-4, last sentence. Per our State Laws, the NMEID can provide grant funds for a project only if EPA funds are provided. This sentence may lead some person to believe that we are able to put up funds if EPA funds are not available.
2. Page 3-1, first sentence. The correct project number is as follows: C-35-1020-01.
3. Table 5-17. This table is misleading and redundant. See comment #1 above.
4. Page 6-69. Please check the wording in the last sentence ("Further, if significant resources...") for meaning. I don't understand how work can be stopped potentially.
5. Page 6-103, second sentence, first paragraph. This sounds to me as though WAPORA is advising EPA not to fund this project. Perhaps the word "if" got lost in the shuffle. In the first sentence of the second paragraph reference to state funds is made yet again.

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1. Page 1-4 of the Draft SEIS has been changed accordingly.
2. The project number has been corrected on page 3-1 of the Draft SEIS.
3. Table 5-17 (page 5-48 of the Draft SEIS) has been deleted.
4. The wording on page 6-69 of the Draft SEIS has been changed.
5. Page 6-103 of the Draft SEIS has been changed accordingly.



Mr. Clinton Spotts  
November 9, 1981  
Page 2

If there are any questions, please do not hesitate to call this office.

Sincerely,



ED STOKES, PE  
Engineering Section

ES:vrt

xc: Steve Romano, EPA  
A. K. Khera, City of Albuquerque  
Dedie Snow, WACGS

SIGNATURE PAGE. EPA RESPONSE NOT REQUIRED

Comments on Draft SEIS

by A.K. Khara, City of Albuquerque, &

John Burgh, Camp Dresser & McKee

<u>Page No.</u>	<u>Paragraph</u>	<u>Comment</u>	
1-4	7	Add the following to last sentence: "for other State or Federal agencies"	1
1-5	3	Statements made are inconsistent with the text and tables. Also, analysis is misleading from local taxpayer's standpoint.	2
1-9	Table 1-2	There should be another category, "Resource Recovery". Impacts are improperly assessed. For example, there is no effect of surface water resources or traffic in Alt. 2A and 2B. This is hard to accept.	3
5-1	5.1.1	Phase IA facilities are not yet constructed.	4
5-7	3	Phase IA facilities are not yet constructed.	5
5-12	Table 5-7	"Base Alternative" should be defined in footnotes. Impacts are not well thought out. DLD has no impacts on reliability, environmental and site impacts; is hard to accept. DLD involves lagooning and therefore impacts of lagooning also apply to DLD.	6a 6b
5-17	Table 5-9	These tables are irrelevant and do not contribute anything but confusion. Wet-air oxidation is not incineration and therefore not covered under air quality regulations. However, exhaust gas incinerators for odor control will be covered by these ordinances.	7
5-18	Table 5-10	Electron beam disinfection has not been proven feasible on dried sludge cake.	8
5-23	1	Previous comment for Table 5-9 applies.	9
5-25	5.5.3	There will be 48 round trips and not 7. This is a major impact. A pipeline to Rio Puerco will have major environmental consequences, besides the fact that it will involve Rio Grande crossing.	10
5-29	1	Other sites were evaluated per John Burgh's and Jim Gibbs' presentations to CAC on 9/29/81. Copy of excerpts attached in Exhibit 1.	11

Responses to Comments from A.K. Khara, City of Albuquerque

and

John Burgh, Camp Dresser and McKee

Albuquerque, New Mexico (11 November 1981)

- The text on page 1-4 of the Draft SEIS has been altered to imply this meaning.
- A cost-effectiveness analysis is conducted to determine cost to the general public at-large, and not the local user. Local user charges will be determined by the City following completion of construction.
- The column headings are representative of the disciplines addressed in Section 6.0 of the Draft SEIS. Resource recovery is a positive cost benefit and is addressed in the cost-effectiveness analysis (Section 5.7 of the Draft SEIS). EPA's position on assessing impacts of the landfill (Alternatives 2A and 2B) is that the landfill will exist regardless of whether or not sludge is disposed there. The sludge will comprise less than 5% of the material disposed at the landfill. Impacts on water or traffic from the sludge only are negligible.
- The Draft SEIS has been changed to indicate Phase I will be complete in 1984, the same year Phase II is to be complete.
- See EPA response to Comment 4.
- Definition of base alternative which is presented on page 5-9 of the Draft SEIS has been added as a footnote to Table 5-7 on page 5-12 of the Draft SEIS.
- Table 5-7 (page 5-12 of the Draft SEIS) was presented as part of the preliminary screening of general options to identify major problems that would remove options from further consideration. Storage of some type is common with a DLD system; however, open lagoons are not a required component of a DLD system. Lagoons were part of the DLD system evaluated for the City of Albuquerque. At the preliminary screening stage the specific Albuquerque system was not being evaluated, therefore lagooning was not evaluated as part of the DLD option. EPA does not accept lagoons as a means of ultimate disposal of sludge based on the environmental effects of this option.
- Conventional wet air oxidation involves temperatures and pressures of up to 600°F and 1,000 to 1,800 psig, resulting in approximately a 95% oxidation of organic material and approximately a 60% reduction in mass. The Albuquerque/Bernalillo County Air Quality Control Board defines an incinerator as any device intended or used for burning waste material to effect a reduction in volume. EPA has interpreted the definition of incineration to include wet air oxidation. It should be noted that Table 5-9 was presenting the preliminary screening of components and the reduction component, including incineration and wet air oxidation, was determined to be unnecessary for Albuquerque.

Responses to Comments from A.K. Khera and John Burgh - Continued

EPA does not interpret the definition of incineration to include the thermal conditioning option of disinfection, since this process results in only a minimal reduction in sludge volume. However, the most effective method of odor control for this system is exhaust gas incineration which would be prohibited by the Air Pollution Control Regulations unless a variance is obtained.

FOR COMMENTS, PLEASE REFER TO PREVIOUS PAGE.

8. As is described in the text under Section 5.5.6 on page 5-32 "electron beam irradiation probably would take place prior to dewatering, although irradiation of sludge at 20% solids is possible." A footnote has been added to Table 5-10 on page 5-18 of the Draft SEIS to indicate that the electron beam option would probably take place prior to dewatering.
9. See EPA's response to Comment 7.
10. The statement on page 5-25 "Seven trucks will be required ..." is referring to the number of trucks, not the number of roundtrips. This section of the EIS is describing the alternatives and does not address their environmental effects. As stated in the Draft SEIS on page 5-25, a pipeline to either the Pajarito or Rio Puerco DLD site would require crossing the Rio Grande.
11. The evaluation of alternative sites was developed and presented to the CAC approximately one month after publication and distribution of the Draft SEIS; therefore, it was impossible to include the information in the Draft SEIS. Upon further request from EPA, the City conducted an additional evaluation which was submitted to EPA in March 1982. This evaluation is included in Appendix E of the Final SEIS.

Page No.	Paragraph	Comment	
5-32	1	Electron beam disinfection has not been proven feasible on dried sludge cake.	12
5-32	2	Alternative sites were evaluated. See comment for page 5-29 above.	13
5-34	1	Statements regarding landfill disposal are biased. We agree that landfill will be in compliance with State and Federal regulations and so will be other alternatives. Therefore, the treatment of alternatives should be consistent.	14
5-35	Table 5-11	It is interesting that there is no traffic disruption with truck traffic and no public safety problem with trucks, but it is the case with a pipeline. It is an apparent case of unthoughtful evaluation.	15
--	Fig. 5-6	Schematic indicates electron beam disinfection of wet sludge, whereas text and cost tables indicate it on dried sludge cake. This is inconsistent.	16
5-42	2	Since disposal of sludge to these other entities is not a base alternative, such documentation is not critical and was not requested to be furnished. A preliminary survey of potential users was conducted and results presented in the Phase II report.	17
5-42	3	Documentation on sludge value is provided in Exhibit 2.	18
5-43	2	Monthly cost per connection is misleading due to following reasons: 1. Debt service for bond sale is not included. 2. EPA will not fund land procurement. 3. EPA will not fund replacement of vehicles or equipment such as injection trucks, etc.	19
5-45	Table 5-14	Item 3B, O&M cost, is in error; therefore, other costs are in error.	20
5-46	Table 5-15	Items 2A, 2B, 3A and 3B are throw-away options. Sludge credit is being included, which is wrong. Furthermore, cost per connection is not reflective of the high capital local share in items 3A, 3B, 3C and 3D.	21

#### Responses to Comments from A.K. Khara and John Burgh - Continued

12. Based on communication with High Voltage Engineering, it is feasible to utilize electron beam irradiation on 20% solid sludge. However, for the Draft SEIS, EPA assumed that liquid sludge would be irradiated by the electron beam process. The cost information presented in the Draft SEIS was provided by the City and was based upon the same assumption of irradiation of liquid sludge.
13. See response to Comment No. 11.
14. The Draft SEIS was based on the assumption that all applicable Federal and State regulations will be complied with. Specified regulations that apply to a particular option are mentioned, as in the case of landfills. EPA believes that the applicability of Federal and State regulations has been consistently applied to all alternatives.
15. Chapter 5.0 simply explains the alternatives evaluated in the Draft SEIS; Chapter 6.0 presents the actual results of the evaluation of effects upon the environment. Table 5-11 on page 5-35 simply lists categories of effects which potentially can occur and often do occur as a result of using the various components listed. Truck transportation often does result in increased traffic and all of the things that happen as a result of increased traffic (e.g., disruption to residents, damage to roadways, increased accidents, congestion of roadways, and all of the other things mentioned in the actual effects evaluation presented in Section 6.8.3 of the Draft SEIS).
16. The costs presented in the Draft SEIS were based completely on costs provided to EPA by the Water Resources Department of the City of Albuquerque. EPA was of the understanding that the costs for electron beam disinfection, as provided by the City, were for irradiating liquid sludge.
17. Table 7-41 (page 7-116) of the City's facilities plan amendment indicates that the city parks and golf courses can only utilize a maximum of 5160 tons of sludge per year. Disposal of the remaining 5580 tons per year (which constitutes a majority of the sludge produced) is totally dependant upon the acceptance of sludge by other entities over which the City has absolutely no control. Thus, disposal of sludge to other entities is not only part of the base alternative (see definition of base alternative on page 5-9 of the Draft SEIS), but is the critical link in guaranteeing success of the City's proposed project. A letter of intent is not a signed contract, but simply an expression of willingness of another party to cooperate in a joint effort. EPA believes that obtaining such a written expression of willingness simply constitutes good and thorough planning. To date EPA has not received any Letters of Intent from entities that the City believes will use sludge in the future. However, EPA is aware that disposal of Albuquerque's sludge as a soil conditioner has not been a problem in the past.
18. EPA's decision concerning sludge value is described in Section 4.1 of this Final SEIS.

FOR COMMENTS, PLEASE REFER TO PREVIOUS PAGE.

Responses to Comments from A.K. Khera and John Burgh - Continued

19. The intent of Tables 5-15 through 5-17 is clearly explained on page 5-43 of the Draft SEIS. EPA assumed that an estimate of the cost of preparing user charge determination studies (which is grant-eligible under Part 35.940-3 of the regulations) was included as a miscellaneous cost item in the City's cost estimates. The costs of bond sales and interest on bonds (which are not grant eligible) apparently were not included in the cost estimates provided by the City and thus are not included in the Tables in the Draft SEIS; however, if the proposed facilities are built by 1984, these costs should be minor. The cost tables also reflect the fact that EPA does not fund pipeline easements, but will fund the cost of land for a DLD system (per Part 35.940-3). In addition, the tables do reflect the fact that EPA will not fund the replacement of vehicles; the replacement costs were taken as a negative salvage value or as an additional O&M expense, whichever was easier to compute. EPA agrees that the tables were not correct since a sludge credit was given for Group 2 and Group 3 alternatives. However, the monthly cost per connection column for \$0/ton sludge credit was correct and did indicate the relative effect of each alternative upon the rate payer. For this reason, EPA does not believe the Tables were misleading.
20. This error has been corrected in Table 3-5 of this Final SEIS.
21. Comment noted. See EPA's response to Comment 19. The cost per connection given in the Draft SEIS was reflective of the high capital cost and low O&M cost associated with the Group 3 alternatives.

Page No.	Paragraph	Comment	
5-48	Table 5-17	Again, sludge credit is included in items 2A, 2B, 3A and 3B, which is wrong.	22
5-49	2	It has been assumed that the City will find an alternative landfill site within reasonable distance, and that landfill of refuse will continue for the next 20 years. This sort of blanket assumption appears faulty.	23
6-15	1	No mitigation measures have been included.	24
6-18	1	Considerations pertaining to resource recovery with DLD also apply to landfill.	25
6-18	4	We take exception to the fact that 40-50 trucks (round trips) of sludge will have no adverse impacts, particularly when crossing the Rio Grande where lack of adequate bridge capacity is a prime concern.	26
6-25	Table 6-3	Sludge wet well overflows will be connected to the Tijeras interceptor; therefore, there is no potential for surface runoff from these.	27
6-25	Table 6-3	Runoff from compost stockpiles will be controlled so there is no potential of contaminating surface runoff.	28
6-26	Table 6-4	We disagree with the evaluation in the table since the alternatives proposed are consistent with EPA regulations and guidelines.	29
6-26	Table 6-4	This table is superfluous, meaningless and inconsistent with the fact that design will have to meet EPA/EIO guidelines.	30
6-32	1	We disagree with the logic and rationale of landfill - "Since landfill is a nuisance, a little more is no nuisance." We think it is very poor treatment of facts.	31
6-43	Table 6-7	Biodegradable material in all cases except composting is alike; therefore, likelihood of an odor potential is equal.	32
6-44	Table 6-7	Poor logic for landfill option. Comment for page 6-32 applies.	33
6-47	Table 6-9	Disagree with evaluation of Alt. 2A, 2B, 3A, 3B, 3C and 3D.	34

#### Responses to Comments from A.K. Khara and John Burgh - Continued

22. See EPA's responses to Comment 19.
23. During conduct of the SEIS process prior to issuance of the Draft SEIS, EPA received copies of budget documents from the City Planning Department which indicated the City had budgeted \$4,219,302 for a new City landfill in City Zone Atlas Area B-17, which is exactly in the middle of the "landfill zone" illustrated in Figure 5-1 on page 5-26 of the Draft SEIS. The budgeted amount was allocated for the following items:
- |   |   |             |
|---|---|-------------|
| • Land: 283 acres x \$12,000/ac   | = | \$3,396,000 |
| • Improvements (access road, fence, office trailer, berm, and utilities): | = | 690,478     |
| • Miscellaneous   | = | 132,824     |
| Total   | = | \$4,219,302 |
- The concept that the City would allocate this amount of funds with such a detailed cost breakdown for nothing more than a blanket assumption appears faulty.
24. Mitigative measures were not included because no mitigative measures were proposed in the City's Facilities Plan Amendment or in subsequent correspondence with EPA prior to the publication of the Draft SEIS. Mitigative measures appropriate to the City's proposed project are included in Chapter 3 of the Final SEIS.
25. The text has been changed on page 6-17 of the Draft SEIS to reflect this comment.
26. This discussion of the trucking alternative is under the Earth Resource Section and is therefore an inappropriate section for the discussion of bridge capacities. However, this is a valid comment for the Transportation section (Section 6.8 on page 6-71 of the Draft SEIS) and the text on page 6-75 of the Draft SEIS has been changed to reflect this comment.
27. EPA is aware that the Tijeras interceptor is available for overflow from the lift stations associated with the proposed Montesa Park pipeline. However, EPA is not aware of any interceptors available for connection to the lift stations associated for the proposed pipelines to the Pajarito and Rio Puerco DLD sites.
28. The control of runoff from compost stockpiles was not specified in the City's facilities Plan Amendment, therefore it was not included in the Draft SEIS. Through the EIS process the City has now proposed to control runoff from stockpiles and this change has been reflected in Chapter 3.1 of the Final SEIS.
29. Effluents meeting EPA standards can still have a significant effect upon the environment. However, the major effects indicated in Table 6-4 on page 6-26 of the Draft SEIS were based upon the assumption that runoff from Montesa Park and the DLD sites would not be controlled, and that breaks in the pipelines and/or overflows of the lift stations would occur. Based upon recent City input, environmental consequences of the

FOR COMMENTS, PLEASE REFER TO PREVIOUS PAGE.

Responses to Comments from A.K. Khera and John Burgh - Continued

City's currently proposed project and other alternatives have been re-evaluated and are presented in Chapter 3.0 of this Final SEIS.

30. See EPA's response to Comment 29.
31. EPA's position is that the landfill is part of the existing conditions. Stated another way, a landfill will be developed regardless of which alternative is chosen to manage Albuquerque's sludge. The Draft SEIS addressed only those additional impacts of the landfill caused by sludge disposal. Since the sludge would comprise less than 5% of the refuse disposed at the landfill, the effects caused by the sludge would be minor.
32. The Draft SEIS text has been changed to reflect this comment.
33. See response to Comment No. 31.
34. The effects of the alternatives on various disciplines (e.g., air, water, etc.) have been revised to reflect the changes the City made in the alternatives since issuance of the Draft SEIS (i.e., the inclusion of mitigative measures).

Page No.	Paragraph	Comment	
6-49	4	Mitigative measures have been ignored in discussions.	35
6-51	2	Fifteen million curies is not firm. It may be 5-10 million curies.	36
6-51	2	There are several larger irradiators currently in industrial use.	37
6-61	Table 6-12	Landfilling of sludge has no biological effects hard to accept.	38
6-66	Table 6-15	Inconsistent and erroneous treatment of facts.	39
6-75	4	Bird strike hazard problem must be addressed based on other similar facilities and situations around the country.	40
6-80	3	23.5 million is not 75% of 3B.	41
6-82	Table 6-17	Figures are inaccurate and misleading. \$0.63 credit applies only to resource recovery options.	42
6-83	2	There is no major fertilizer industry in Albuquerque; hence, there are no employment impacts.	43
6-93	3	Mitigation measures are not stipulated or accounted in the statements.	44
6-95	4	Safety features and redundancy are standard for the industry and therefore apply both to electron beam, Cesium-137 or Cobalt-60 irradiators.	45

#### General Comments

In summary, we feel that the Draft SEIS prepared by WAPORA, Inc., has provided data and assumptions that are misleading and inconsistent. As an example, acquisition of land for DLD is not fundable by EPA and therefore is a greater burden on local taxpayers. Furthermore, land that has been used exclusively for sludge disposal for 20 years has been assumed to appreciate in value. We do not concur with this assumption.	46a 46b 46c
We feel that the sensitive subject of traffic congestion, particularly in the northern industrial sectors, and lack of adequate Rio Grande crossings, has been completely ignored.	47
We do not concur with the logic and rationale that landfills are a nuisance anyway and therefore dependence on landfill for sludge disposal has no impacts whatsoever.	48

#### Responses to Comments from A.K. Khara and John Burgh - Continued

35. See response to Comment No. 24.
36. The actual source plaque size will be based on the gross tonnage of sludge to be processed per day. The figure of approximately 15 million curies was calculated by the Department of Energy (DOE) based on information provided by the City. For further information see the 5 October 1981 letter from the DOE to WAPORA, Inc. in Appendix A of this Final SEIS.
37. Comment noted.
38. See response to Comment No. 31.
39. Comment noted.
40. EPA does not see any inconsistency with this comment and the statement on page 6-75 of the Draft SEIS.
41. The economic evaluation on page 6-80 simply noted that, if all other alternatives were found to be not environmentally sound, EPA potentially could fund up to a maximum of  $75\% \times \$31,281,900 = \$23,461,425$  (roughly 23.5 million). EPA funding decisions, as explained in Section 4.3 of this Final SEIS, indicate EPA may fund up to 85% of the City's proposed project.
42. Table 6-17 does not indicate the \$0.63 credit is applicable to all alternatives. It says (footnote) that if sludge is sold, the cost per month will be reduced by \$0.63. If sludge is placed in a landfill or injected in the ground, it cannot be sold.
43. EPA agrees that there will not be a significant effect on the fertilizer industry (i.e., fertilizer distributors) in Albuquerque; therefore, the text on page 6-83 has been altered to reflect this comment.
44. See response to Question No. 35.
45. EPA concurs with this comment. Although the text of the Draft SEIS implied that safety features and redundancy are standard for both the electron beam and Cs-137 irradiators, the text has been changed to state this explicitly (see Chapter 5 of the Final SEIS).
- 46a. Comment noted.
- 46b. EPA regulations (Part 35.940-3) state that the cost of land for DLD is fundable, and therefore the cost of land was included in the cost analysis in the Draft SEIS. The resulting economic burden on local taxpayers (if any) was illustrated in the cost-effectiveness tables of the Draft SEIS.



FOR COMMENTS, PLEASE REFER TO PREVIOUS PAGE.

Responses to Comments from A.K. Khara and John Burgh - Concluded

- 46c. Appreciation of land at 3% per year is required by EPA regulations, and is not subject to City concurrence. New cost-effectiveness analysis tables are contained in Chapter 3.0 of this Final SEIS.
47. The subject of traffic congestion, particularly in the northern industrial sectors, was addressed on page 6-75 (Section 6.8.3) of the Draft SEIS. Both truck routes to the DLD sites cross the Rio Grande. The route to the Rio Puerco DLD site uses the I-40 bridge across the Rio Grande and is not expected to present any problems with capacity. However, there is concern about the capability of the Rio Bravo Bridge across the Rio Grande used by the truck route to the Pajarito DLD site. The text on page 6-75 of the Draft SEIS has been changed to reflect this concern.
48. See response to Comment No. 31.

DEPARTMENT OF TRANSPORTATION  
FEDERAL AVIATION ADMINISTRATION

DATE: November 13, 1981  
IN REPLY REFER TO: ABQ ADO-610

AIRPORTS DISTRICT OFFICE  
2930 Yale, SE., Room 109A  
Albuquerque, NM 87106



SUBJECT: Supplemental Draft, Environmental Impact Statement, Wastewater Facilities-Sludge Management System, Albuquerque, New Mexico

FROM: Chief, Airports District Office

TO: Mr. Clinton B. Spotts  
Regional EIS Coordinator  
U.S. Environmental Protection Agency  
1201 Elm Street  
Dallas, TX 75270

We have reviewed the subject Supplemental Draft and offer the following comments for your consideration:

Page 1-6, Alternative 1C, 1D, 1F and 1G. These alternatives require open air drying as one of the steps in processing sludge. Care must be taken to prevent such an operation from attracting birds. Any concentration of birds in the project area could be a hazard to aircraft arriving and departing Albuquerque International Airport.

1

*Bill J. Howard*  
BILL J. HOWARD

RECEIVED  
NOV 17 1981  
S & A DIVISION

Responses to Comments from Bill J. Howard  
Department of Transportation, Federal Aviation Administration  
Albuquerque, New Mexico (13 November 1981)

1. The Bird Aircraft Strike Hazard (BASH) report prepared by the US Air Force expressed concern about the attraction of birds to lagoons at Montesa Park. Although the City did at one time propose using sludge lagoons as an interim measure, none of the alternatives for ultimate treatment and disposal of sludge as evaluated in the Draft SEIS proposed the use of lagoons at Montesa Park. At CAC Meeting 17, a member of the Air Force BASH team expressed concern about the attraction of birds to open air drying beds. Since issuance of the Draft SEIS, the City has made certain changes which include: (1) deleting open air drying from consideration due to being environmentally unacceptable; and (2) enclosing all stockpiles. These changes should alleviate concerns over the attraction of birds to the proposed sludge handling facilities.



United States  
Department of  
Agriculture

Soil  
Conservation  
Service

Box 2007  
Albuquerque, NM  
87103

RECEIVED November 16, 1981

NOV 19 1981

S & A DIVISION

Mr. Clinton B. Spotts  
Regional EIS Coordinator  
Environmental Protection Agency  
1201 Elm Street  
Dallas, TX 75270

Dear Mr. Spotts:

A copy of the Draft Supplemental EIS for Waste Water Treatment Facilities-Sludge Management System, Albuquerque, New Mexico, dated September 25, 1981, has been received.

We want to clarify the role of the SCS as a "cooperating agency" as identified in the EIS pages 1, 1-10, and 7-5. In response to a letter dated August 28, 1980, from your office requesting that we participate in the preparation of the DEIS, especially in relation to use of the sludge as a soil fertilizer/conditioner, we agreed to supply soils information, review, and technical information. To our knowledge, no requests were ever made by EPA or by your consultant WAPORA, Inc., for technical input from SCS.

We would like to address the proposed use of the "disinfected" sludge on city parks and golf courses as a soil conditioner and fertilizer. The primary source of our information is the 1978 report "A Plan for Irrigation Water Management on Albuquerque City Parks" which we prepared for the City of Albuquerque. In addition, Dr. B.D. McCaslin of New Mexico State University furnished the approximate analysis of nutrient components found in sludge from the Albuquerque Plant No. 2.

Our interpretation of this information indicates that plans to apply at least 7,000 tons of sludge each year to some 1,400 acres of turf grasses will exceed rates needed to maintain a sod cover that is satisfactory for recreational uses. The excess will result in the need for the application of additional irrigation water as well as for more frequent mowing, raking, and disposal of grass clippings.

This is not to say that the proposed rates will be deleterious to the turf, but to point out some of the management consequences. The rates of sludge application do not exceed what could reasonably be expected to be assimilated by irrigated turf grasses. The irrigation systems installed in Albuquerque parks have sufficient delivery rates to accommodate the needed increases.

RESPONSE TO COMMENTS FROM RAY T. MARGO, JR.  
US DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE  
ALBUQUERQUE, NEW MEXICO (16 NOVEMBER 1981)

1. EPA appreciates the SCS comments on the Draft SEIS. These comments along with data from other sources (e.g., letter from George A. O'Connor, contained in Appendix A) were taken into consideration by EPA when determining how much credit should be given for Albuquerque's sludge and ultimately which alternative should be funded. EPA has decided to give the sludge a credit of \$70.00 per ton. The information provided by the SCS was useful and appreciated.



Mr. Clinton B. Spotts

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Proper irrigation rates of normally maintained turf grasses call for the addition of water to only the upper 2-4 inches of soil, and only in amounts sufficient to replace soil moisture lost to plant growth. With the proposal to add supplemental amounts of sludge, the increased irrigation rates needed will wet the soil to depths of one foot, and there would be leaching of soluble materials to those depths.

If the irrigation management plan is followed, we would not foresee any serious problems in using turf grasses to dispose of the stated amounts of sludge. Also, if irrigation application rates and frequencies follow the plan, we would not foresee any large-scale movement of irrigation water into groundwater.

Section 5.7 Cost Effectiveness Analysis is difficult to comprehend and interpret. Cost effectiveness of project alternatives is usually stated in terms of dollars per unit. In this case, it could be stated as dollar cost per ton of sludge treated. An array for all alternatives would aid in comprehension of the economic considerations.

We feel that placing a value of \$70 per ton for sludge is high. We do not agree that this value represents the true market value. A substitute product in the form of steer manure in 50-pound bags sells for \$40 a ton--or about \$20 a ton in bulk.

Section 6.9 Economics describes project effects in terms of social parameters; i.e., city finances and expenditures, population and employment. It does not provide an economic analysis and a display of the beneficial and adverse effects. Such effects might include project costs, operating costs, maintenance and replacement costs, and cost savings.

Section 6.1.3 Environmental Consequences mentions wind or water erosion as potential problems with both the landfilling or the dedicated land disposal methods. We feel that these problems would be of minor consequence and could be easily mitigated with inexpensive, conventional conservation measures.

Section 6.3 Groundwater discusses, in several alternatives, the potential for contamination of groundwater. It is implied that application rates for sludge are critical; while in fact, it would be the application rates for irrigation water that would determine the possibility of groundwater contamination.

We appreciate the opportunity to review this document.

Sincerely,



Ray T. Margo, Jr.  
State Conservationist

cc:  
Norman Berg, Chief, Soil Conservation Service, Washington, DC  
Edwin Swenson, Biologist, Soil Conservation Service, Albuquerque, NM

Responses to Comments from Ray T. Margo, Jr.

2. The cost-effectiveness analysis presented in the Draft SEIS considers construction cost, operating and maintenance costs, replacement costs, and salvage value. The cost-effectiveness analysis in Section 3.4 of the Final SEIS also considers new cost information provided by the City. Section 3.4 also presents the costs of alternatives in dollars per ton of sludge treated.
3. See EPA's response to Comment 1.
4. See EPA's response to Comment 2.
5. Section 3.3 of the Final SEIS presents these impacts as minor.
6. Page 6-31 of the Draft SEIS has been changed by errata to include irrigation rates also as being significant.

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6-55

To: C.A.C.  
From: J.B.Sorenson  
Re: Draft EIS/ Mitigation Measures Additions

DEC 16 1981  
**RECEIVED**  
DEC 10 1981  
S & A DIVISION

RESPONSES TO COMMENTS FROM J.B. SORENSON  
CITIZENS' ADVISORY COMMITTEE  
ALBUQUERQUE, NEW MEXICO (16 NOVEMBER 1981)

1. The DOE requires a Safety Analysis and Review System study for all environmental, safety, and health (ES&H) risks. This would apply to the irradiator. There is no mention of it in the DEIS. The provision for a safety analysis to assure quality control for ES&H risks should be extended to all disinfection systems. It should also be matched with a requirement for an independent audit and public review of the acceptability of the safety analysis.

The effect of the requirement of a safety analysis for ES&H risks coupled with a requirement for an audit and public input and review would be to be assured that promises regarding safety, health and the environment have been kept. In brief, it will provide continuing evidence and verification that:

- the facility for disinfection is built as intended
- it is operated as was proposed
- it is verified on a continuing basis as safe

The importance of establishing a safety analysis and an independent audit and public review requirement in the Mitigation Section of the DEIS is twofold:

1. While the EIS is subject to public review, the Safety Analysis is not. Hence, we can establish the basis for public participation with regard to safety, health and environmental concerns.
2. It will help to assure that the safety concerns of the community with regard to the irradiator and any other disinfection process will be fully addressed on a continuing basis.

Thus, it is proposed a motion be adopted to include the above statement in the submission of our comments to EPA as a request of this committee.\*

2. §10.3 (no page) describes the Electron Beam Process. Under Public Health it states that this process toxic organic chemicals resident in some sludges. These toxic organic chemicals comprise pesticides, PCBs, herbicides, organic solvents and certain other carcinogenic compounds which are "untouched by most treatment processes, including incineration." Electron beam energy produces hydroxyl compounds and sufficient activation energy to degrade these compounds.

The state Water Quality Control Commission has established the presence of organic contaminants in ground water and are regulating for eight(8) of them. They are:

benzene/C<sub>6</sub>H<sub>6</sub>, benzol; coal naphtha; cyclohexatriene; phenyl hydride

\* In compliance with CEQ Regs. for the implementation of NEPA, 40 CFR Parts 1500-1508, specifically 1505.2

1. An Environmental Readiness Document (ERD) is being prepared by DOE for the Cs-137 sludge irradiator. A preliminary draft copy of this document was made available to EPA. This document was not quoted in the Draft SEIS since it is still at the preliminary draft stage and is still subject to in-house review, and thus currently is not a public document. Provisions for audit and review of the ERD are subject to DOE procedures which are beyond the jurisdiction of EPA.
2. The Albuquerque Industrial Pretreatment Program Development manual submitted to EPA on 29 June 1981 summarizes testing of the sludge for metals and other priority pollutant compounds. The data indicates that the sludges in the sampling described were within the standards published by the Water Quality Control Commission. This data also is consistent with earlier test work on sludge quality. All this information supports the position that sludges produced in Albuquerque conform to all applicable State and Federal regulations for land application. EPA toxicity testing has also been conducted and the sludge quality is well within the carefully drawn and conservative published regulations and guidelines for this type of disposal method. See Appendix D of this document for laboratory report data resulting from toxicity testing of Albuquerque's sludge.

6-56

2

EDC/1,2-dichloroethane/ $C_2H_4Cl_2$ /brocide; dutch liquid; ethenedichloride; ethylene chloride; ethylene dichloride; glycol dichloride; sym-dichloroethane

$CCl_4$ /carbon tetrachloride/benzoinform; necatorin; perchloromethane;

1,1-DCE/1,1-dichloroethylene/ $C_2H_2Cl_2$ /asym-dichloroethylene; 1,1-dichloroethene; unsym. dichloroethylene; vinylidene chloride;

PCBs/polychlorinated biphenyls/Commercial products such as the arochlors (e.g., arochlor 1260) are complex mixtures of PCBs./Numerous synonyms are listed in Sax, 1979, page 484;

PCE/tetrachloroethylene/ $C_2Cl_4$ /ankilosten; carbon dichloride; didakene; ethylene tetrachloride; nema; perchloroethylene; perclene; tetracap; tetrachloroethene; 1,1,2,2-tetrachloroethylene; tetropil;

Toluene/ $C_6H_6$ /methacide; methylbenzene; phenylmethane; toluol;

TCE/trichloroethylene/ $C_2HCl_3$ /algylen; germalgene; trethylene; tri; tri-clene; trichlofan; trichloren; trichloroethene; 1,1,2-trichloroethylene; trielene; triline; trimar; westrosol;

The question is whether any of these organic contaminants, now found in ground water in Albuquerque, are also present in the sludge. If so, do they pose a health problem? If so, how will they be treated? The DEIS, with the exception of the statement in §10.3, does not touch on the question of organic toxics.

Thus, it is proposed a motion be adopted to include the above statement in the submission of our comments to EPA as a concern of the CAC.

3. An alternative site to Montessa Park is to move the disinfection facility to the federal lands, the Forest Service/Air Force lands, that is adjacent to Montessa Park. This site offers the potential of solving most, if not all, of the problems associated with the Montessa Park site: possible odor problems, the potential negative economic impact on neighboring land owners, the potential bird strike hazard, the possible safety and security problems, and the open spaces problem. The CAC, through its chairman, has initiated inquiries along these lines.

Thus, it is proposed a motion be adopted to include a review of the federal lands alternative as an extension of the present DEIS, and that this motion be submitted to EPA as one of our comments on the DEIS.

(state & federal)  
and private

# Responses to Comments from J.B. Sorenson - Continued

3. A Kirtland Air Force Base site was considered, but rejected because of objections by Air Force officials and high pumping cost. Refer to Appendix E for additional information regarding analysis of alternative sites.

CONFIDENTIAL

NOTION

The CAC, upon review of the DEIS, finds it seriously deficient with regard to the key parameters of: the identification of alternatives and assessment of costs, the impacts, and the mitigation measures. The details of its specific findings are included in a CAC package of:

1. Review Comments by Larry T. Caudill, prepared at the request of the CAC.
2. Review Comments by A. K. Kehra, prepared for the Water Resources Department and submitted to the CAC.
3. Comments by the CAC members

Responses to Comments from J.B. Sorenson - Concluded

4. EPA's responses to the specific comments of Larry T. Caudill, A.K. Khera, and CAC members are contained in Chapter 6.0 of this Final EIS.

Statement on the Draft EIS and Cs<sup>137</sup> Irradiator  
Given at the Public Hearing November 17, 1981  
City Hall, Albuquerque, New Mexico

Responses to Comments from Evelyn Oden, M.D.  
Citizen's Advisory Committee  
Albuquerque, New Mexico (17 November 1981)

My name is Evelyn Oden, I am a physician, specializing in pediatrics and a member of the Citizen's Advisory Committee. My major objective while representing the citizens of Albuquerque has been directed towards the health effects of the method of disinfection selected by the City Of Albuquerque. The following comments summarize my position, as a health care provider, on the disinfection process chosen by the City of Albuquerque and described in the DEIS. The comments directly address the Cs<sup>137</sup> irradiator, as the health effects of this process presented in the DEIS and to the CAC by Sandia National Labs are scant.

Odor has been a concern of the members of the CAC and the citizens of Albuquerque, especially the people in the Mountainview area. It indeed is a health concern as it affects the quality of life. As described in the DEIS, odor control depends greatly on the effectiveness of the process of anaerobic digestion. It must be clearly understood by the citizens of Albuquerque that the irradiator, in no way, solves the odor problem, that excessive odors must be controlled in the processes preceeding irradiation (anaerobic digestion, drying) and with stockpiling after the disinfection process.

I would like to address certain aspects of Cs<sup>137</sup> that were not mentioned in the DEIS nor considered by the CAC. It involves the activity of Cs<sup>137</sup> once it is ingested, where it is distributed and how it is eliminated from the body.

Cs<sup>137</sup> and potassium have similar chemical and biochemical properties. Cs<sup>137</sup> is dissolved in body fluids and is distributed throughout the body.

1. The groundwater table below Montesa Park is approximately 210 feet deep. The comment that "a site where groundwater is close to the surface is being considered as an alternative to Montesa Park" is correct, in that other such sites were evaluated. These other sites were discarded, primarily due to the shallow groundwater depth. For a complete description of the site analysis conducted by the City, see Appendix E.



It is absorbed rapidly and completely in the digestive tract. The average biological half life is 109 days with a range from 68 to 165 days.<sup>1</sup> It concentrates, among other places, in the muscles<sup>2</sup> and is eliminated through the kidneys. As a result of atmospheric weapons testing, there is a slowly decreasing level of Cs<sup>137</sup> in the environment and food that results in man now having a body burden of approximately 25pCi/g of potassium, delivering an annual radiation dose of about 500 mrad (MCRP, 1977a).<sup>3</sup>

This information is important, in the "unlikely" event of ground water contamination resulting in Cs<sup>137</sup> contamination of public drinking water. This is a real public health threat if the irradiator is located at a site where ground water is close to the surface. A site such as this is being considered as an alternative to Montessa Park for the irradiator. Alternative sites for the irradiator have not been reviewed in the DEIS or to date, by the CAC. A complete evaluation of soils, groundwater tables and flood plains for all of the alternative sites is necessary before the irradiator can be a safe and acceptable alternative.

As mentioned in the DEIS..."overexposure to personnel at the irradiator is a more likely occurrence of the accident scenarios...In the event of overexposure, impacts on personnel involved would be severe and extreme cases would result in death. Unshielded exposure for a few seconds within 10 feet of the source plaque would result in instantaneous death"(p.6-95). Detailed preventive and safety procedures are given in the Appendix 10.2 of the DEIS and Sandia documents.

Since the proposed irradiator will be the very first full-scale experimental (40 pin 5 to 7 MCi) gamma irradiator using Cs<sup>137</sup>, problems with the irradiator that will develop in its 20 year life are unknown. The safety record of smaller Co<sup>60</sup> irradiators currently in use was inadequately described in the SEIS (Section 10.2). The magnitude (curies) of gamma radiation and capacity of the irradiators

Responses to Comments from Evelyn Oden, M.D. - Continued

2. The magnitude of the source plaque and the capacity of the Co-60 irradiators is considerably smaller than the Cs-137 irradiator which is proposed for disinfection of Albuquerque sludge. The technology which is used in the smaller Co-60 irradiators is similar to that which would be used in the Cs-137 irradiator, therefore an examination of their safety records was presented. This information was given only to exemplify the type of accidents that have happened with a similar technology. An exact correlation for emission or exposure was not intended.

was not given. This information should be provided in the final EIS, as it is important for comparison. Listed are some of the examples of accidents involving a few existing Co.<sup>60</sup> irradiators as reported by the NRC. They include:

-Radiation exposure to workers (twice in 7 years).

In each case, the worker entered the conveyor area when the source plaque was exposed, even though those safety measures had been designed into the system. It was reported that the incidences resulted in no overexposure, but this is vague terminology. Overexposure could mean instantaneous death, radiation sickness, with ensuing leukemia. An estimation of the dose needs to be cited.

-Two fires at irradiator facilities in NRC region 1 in the past 5 years. Amount of worker exposure is unknown, as it is vaguely stated that these incidences resulted in no overexposure. Again, estimates of the dose received need to be given.

-Three source pin leaks have occurred in the past 8 years.

19-6 One cannot automatically conclude that these events will occur with the proposed, larger Cs<sup>137</sup> irradiator. Neither can it be assumed that in the 20 year operational period that there will be no accidents resulting in exposure to workers or to the general public. These uncertainties, along with the proven dangers of radiation, make the Cs<sup>137</sup> irradiator the least desirable alternative for disinfection. The other time proven disinfection methods, namely composting and wet air oxidation, have less severe consequences for the citizen's of Albuquerque now and in future generations.

Evelyn Oden, M.D.  
Private Citizen  
Citizen's Advisory  
Committee

Responses to Comments from Evelyn Oden, M.D. - Concluded

- 2
3. The workers who entered the conveyor area when the source plaque was exposed definitely received an overexposure to radiation. Overexposure is defined as an exposure above the limits specified in the regulations. A stricter definition would be any unplanned exposure. Section 10.2 of the SEIS has been changed to further emphasize that the workers were overexposed. The dose received by these two workers is not comparable to the dose that would be received in a similar incident at the proposed irradiator since the source plaque would be considerably larger and less time would be needed for overexposure. As was stated in the Draft SEIS (page 6-95), unshielded exposure for a few seconds within 10 feet of the source plaque would result in almost instantaneous death. The two fires at irradiator facilities in NRC Region 1 resulted in no radioactive material being released and no exposure to the workers or the general population other than that which would have resulted from normal operation. At one of the fires, the specialized "clean-up" crew did receive exposure greater than that resulting from normal operation, but not greater than the regulatory limit for radiation workers (by phone, Jim Nicolosi, NRC Region 1, 5 January 1982).
- 3

FOOTNOTES

1. NCRP Report #65, Management of Persons Accidentally Contaminated with Radionuclides. NCRP, 1979
2. Safety Series #47. Recommended Manual on Early Treatment of Possible Radiation Injury. International IAEA, Vienna, 1978.
3. NCRP Report #65, .p.78

FOOTNOTE PAGE. EPA RESPONSE NOT REQUIRED

November 12, 1981

Jay Sorenson, Chairman, Citizens' Advisory Committee

James Wiegmann, CAC Member (Economic Interest)

Review and Comments Concerning Draft SEIS on  
Wastewater Treatment Facilities - Sludge Management System

RECEIVED

DEC 10 1981

S & A DIVISION

As per your request, I have reviewed the Draft SEIS and I offer the comments that follow. In the interest of avoiding redundancy, points which have already been made in reviews previously submitted by Larry Caudill and A. K. Khera will be omitted.

Page No.	Paragraph	Comment	
6-22	4	500-year flood plain data should be included. Potential changes in drainage flow pattern should be studied in regard to probable development of lands adjacent to and upstream of the Montessa Park area.	1
6-5 thru 6-13		Reports of soil problems encountered by the abandoned Montessa Park Detention Facility have not been mentioned or examined.	2
6-28	4	Depth to groundwater listed at 210 ft. in Montessa Park conflicts with statement on page 6-97, paragraph 1, where depth is described at 300 ft.	3
6-29	2	Statement which reads "... there is little use of groundwater near Montessa Park or several miles south" is probably correct at the present time. It will be grossly incorrect within a few years as development takes place. The area adjacent to Montessa Park on the south is described in the Comprehensive Plan as a potential location of a future urban center or planned new community. City officials have stated that this potential satellite community would probably be required to construct its own water system. Leachate from any facility at Montessa Park has to be considered as a possible groundwater contamination source for a future community water system.	4
6-39	2	The future environmental impact of odor pollution from a Montessa Park facility has not been addressed in light of future development of the lands to the south. The "... year-round occurrence of winds from the north-northwest" and "...impacts over an area of many square miles..." should be examined for the proposed facility as well as the Plant No. 2 area. Exportation of odor pollution to an area of lesser present day population might turn out to be a mere temporary solution to a long-term problem.	5

RESPONSES TO COMMENTS FROM JAMES WIEGMANN, CAC MEMBER

THE UNIVERSITY OF NEW MEXICO

ALBUQUERQUE, NEW MEXICO (17 NOVEMBER 1981)

1. EPA does not allow construction in 100-year floodplains, however EPA has no requirements concerning construction within the 500-year floodplain. For this reason, presenting 500-year floodplain data was not within the scope of this SEIS. Changes in the floodplains due to the proposed project were evaluated and determined to be insignificant.
2. EPA is aware of the soil stability problem at Montessa Park. Recent information has been received which indicates that soil instability will not be a problem with the proposed project. For further information, see the City's report entitled "Foundation Soil Conditions - Montessa Park Vicinity" prepared by Benny McMillan & Company.
3. Page 6-97 of the Draft SEIS has been changed to reflect this comment.
4. The City's proposed project has been revised to include filtrate, leachate, and surface run-off control therefore, no groundwater contamination is expected. Further elaboration of this topic is presented in Sections 3.1 and 3.2 of the Final SEIS.
5. EPA agrees that existing and future development surrounding the proposed facility at Montessa Park could be affected by malodorous upsets at the facility. The text on page 6-49 of the Draft SEIS has been changed to reflect this comment.

6-63

November 17, 1981

Memo to Jay Sorenson, Chairman, Citizens' Advisory Committee

Page No.	Paragraph	Comment
5-42	2	The UNM Golf Course manager has stated that UNM is not a buyer for sludge fertilizer at this time. Reference to the University as a user should be deleted.
6-81	3	Discussion of effect on land values is superficial at best. The design and location of any final facility will have potentially drastic effects on the value of nearby properties. In the case of the University of New Mexico who either owns or is the beneficiary of lands both north and south of the Montessa Park area, potential losses in future revenue can easily be many millions of dollars. Institutional funds which might have been generated by these properties will most likely be replaced by State Government and thus the taxpayers of New Mexico. Any unfavorable alteration of the development characteristics of the southeast mesa area could cause the citizens of the Albuquerque metro area to lose significant amounts of future property tax revenues and economic opportunities associated with development.  A reduction in the developability of the southeast mesa might result in further population shift to the west side of the Rio Grande with consequent increases in public infrastructure expenditures (i.e., bridges). In short, economic issues have either been ignored or glossed over as unimportant throughout the Draft SEIS.
6-39	1	It is mentioned that there was a stipulation in 1980 which required the City to institute the following conditions at Plant No. 1: (1) Not vent odorous gases; (2) Discontinue the use of sludge drying beds; (3) Remove sludge on a daily basis. Why aren't these parameters being used as standards in the design of the proposed facility at Montessa Park?

Responses to Comments from James Wiegmann - Concluded

6. On page 5-42 of the Draft SEIS, the University of New Mexico (UNM) is listed as a potential user of the sludge produced during the 1990 design year. This statement was not intended to imply that UNM is currently a buyer of the sludge. As was stated in the Draft SEIS, there has been no documentation to-date that the UNM or other entities are willing to purchase or utilize sludge in the future.
- 7a. EPA's evaluation did not determine that drastic effects on land values would occur due to the proposed project or alternatives. Effects of the City's currently proposed project are presented in Section 3.2 of this Final SEIS.
- 7b. EPA's evaluation did not determine that a gross reduction in the developability of the Southwest mesa or any other area would occur.
8. According to the City, these standards are being used for the expansion of Plant No. 2. Recent revisions to the proposed project include odor control for gases vented to the atmosphere, deletion of alternatives considering open air drying, and covered stockpiles for the dried sludge. Further elaborations on revisions to the proposed project are included in Section 3.1 of the Final SEIS.

Evelyn Oden  
7505 Forsythe, SW  
Albuquerque, New Mexico 87105  
November 18, 1981

Responses to Comments from Evelyn Oden,  
Member of the Citizen Advisory Committee  
Albuquerque, New Mexico (18 November 1981)

Mr. Clinton B. Spotts  
Regional EIS Coordinator  
United States Environmental  
Protection Agency  
Region VI  
1201 Elm Street  
Dallas, Texas 75270

Dear Mr. Spotts,

In order to adequately evaluate the most feasible method of disinfection for Albuquerque's municipal sludge, it is essential that WAPORA reconcile the disparity of costs for wet air oxidation as given by Zimpro and the City of Albuquerque. Please include the final cost analysis in the final EIS.

Sincerely,

*Evelyn Oden*

Evelyn Oden  
Member  
Citizen's Advisory Committee

cc Jay Sorenson  
Charles Varnell

Rec'd by  
EPA  
11/18/81  
J. Varnell

1. The Draft SEIS evaluated and costed a conventional wet air oxidation system which achieves 95% oxidation of organic matter. The Zimpro process discussed by the CAC during the public participation process is not a wet air oxidation process, rather it is a thermal conditioning process that achieves approximately 5% oxidation in organic matter. Conventional wet air oxidation was screened out for Albuquerque due to high O&M costs, particularly high energy costs. An evaluation and cost analysis of the Zimpro thermal conditioning process was conducted based on a request by the CAC following the issuance of the Draft SEIS. This information has been included in Section 3.3 of the Final SEIS.



United States Department of the Interior

OFFICE OF THE SECRETARY  
Office of Environmental Project Review  
Post Office Box 2088  
ALBUQUERQUE, NEW MEXICO 87103

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Responses to Comments from Raymond P. Churan  
US Department of the Interior, Office of Environmental Project Review  
Albuquerque, New Mexico (19 November 1981)

ER 81/2170

NOV 19 1981

Mr. Clinton B. Spotts  
Regional EIS Coordinator  
U.S. Environmental Protection Agency  
1201 Elm Street  
Dallas, Texas 75270

Dear Mr. Spotts:

This responds to your September 25, 1981, request for our evaluation and comments on the Draft Supplement to the Final Environmental Impact Statement for Wastewater Treatment Facilities - Sludge Management System, Albuquerque, New Mexico. The following comment is provided for your consideration:

We note that under all sludge management alternatives, there will be an unavoidable increase in the nutrient load at the Isleta diversion due to the nutrient level in the effluent. We realize nutrient load in the effluent is a subject considered in the Wastewater Treatment Facilities Final Environmental Impact Statement and is outside the scope of the supplement; however, we believe the effects on the Isleta diversion demonstrate the need for nutrient removal at sewage treatment plants on the Rio Grande.

We appreciate the opportunity to review this Draft Supplement.

Sincerely yours,

*Raymond P. Churan*  
Raymond P. Churan  
Regional Environmental Officer

1. Comment noted.

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NOV 23 1981

S & A DIVISION

Bruce M. Thomson  
600 La Veta NE  
Albuquerque, NM 87108  
Nov. 19, 1981

Responses to Comments from Dr. Bruce M. Thomson, P.E.  
Albuquerque, New Mexico (18 November 1981)

1. Comment noted.

Clinton B. Spotts  
Regional EIS Coordinator  
Environmental Protection Agency (6ASAF)  
1201 Elm Street  
Dallas, TX 75270

Dear Mr. Spotts:

To reduce the potential for misunderstanding, I am sending you my comments on the Supplemental Draft Environmental Impact Statement on the Wastewater Treatment Facilities-Sludge Management System, Albuquerque, NM. This letter summarizes comments made by me at the Public Hearing of November 18, 1981.

I first wish to commend the staff of the Water Resources Department of the City of Albuquerque for conducting an open and thorough public participation program. Throughout the past 14 months they have shown tremendous patience and willingness to work with both the Citizens Advisory Committee and the general public. I am certain that in reviewing the record, you will find that their efforts have more than met the Federal requirements for public participation.

I have reviewed in detail all of the major documents associated with the proposed sludge management system including the Facilities Plan (Balloon Report) and the Supplemental Draft EIS (SDEIS). I believe that in making a final process selection it should be recognized that there is a clear mandate from all parties involved, including the Citizens Advisory Committee, that the waste sludge should continue to be used in a beneficial manner. This is most evident in their near unanimous and emphatic rejection of Dedicated Land Disposal and Land Filling options discussed in the SDEIS. If this directive is followed, and I believe it should be, some form of sludge disinfection will be required under current regulations.

I am familiar with the two most reasonable disinfection alternatives proposed, composting and irradiation. I have visited the Sandia Irradiator for Dried Sewage Solids on a number of occasions, and have in fact actually been inside



it (with appropriate monitoring instrumentation I might add) this past summer when one of the Cs-137 pins was removed for testing. I believe that either alternative can provide adequate disinfection if properly design and operated. In light of my familiarity with the local constraints, and assuming that the costs are equal, I believe that irradiation is the most desirable alternative due to the following factors:

- a. ease and simplicity of operation of the irradiator,
- b. thoroughness of disinfection is independent of uncontrollable variables, although composting is subject to O & M errors, weather conditions, and temperature variations within the pile,
- c. it appears safer for the operators than composting as it involves little heavy equipment and there is reduced potential for airborne pathogenic diseases,
- d. it does not destroy any of the nutritional value of the sludge.

In reviewing the SIDSS program, and the proposed application of this technology to the City's problems, I find it extremely unlikely that employees of the Water Resources Department will receive an annual radiation dose above background levels that is statistically significant. The chances that the general public would be exposed appears to be several orders of magnitude less.

There are three areas that do not appear to be adequately addressed in the SDEIS. The first is the discussion of the trucking alternatives to the use of pipelines. There should be quantitative discussion of the negative impacts of this option to specifically include; the expected potential for fatal and non-fatal accidents with an included cost to the local community, and the effects of up to almost 50 truck trips per day on existin roads, again with cost analyses. The existing raod system in the vicinity of Plant 2 is not, in my opinion, suitable for this proposed alternative as the projected traffic will be large trucks loaded to maximum capacity. Recent findings have implicated this traffic in excessive wear and destruction of roadways of all designs. There will certainly be severe negative economic impacts regardless of the final disposal alternative, and these should be calculated rigorously.

The second area that I feel should be addressed is an alternative to Montessa Park for sludge treatment. The projected capital cost of the pipeline and pumping system for this alternative is enormous (\$1.2 million is the value determined by Wilson & Co.) with total annualized costs of \$230,000. In addition to the obvious waste of energy and resources, I have philosophical difficulties with the pump-age of sludge six miles to a second treatment facility when

Responses to Comments from Dr. Bruce M. Thomson, P.E. - Continued

2. An evaluation of the impacts of the trucking alternative is included in the Land Use and Transportation section of the Draft SEIS (Section 6.8) in Table 6-16. Since the wording used in Table 6-16 was not very specific, it has been changed in the F-SEIS (Section 5.0). A more detailed discussion of the impacts associated with trucking, including the potential increase in accidents, was included on page 6-75 of the Draft SEIS.
3. The City already owns more than 60 acres of usable property located immediately north of the plant complex. A portion of this tract will be used for the Phase II liquid treatment works and certain supporting facilities, as is outlined in the site development plan in Chapter 1 in the Balloon Report. However, the City has stated that constructing sludge handling facilities (other than perhaps mechanical dewatering) at the plant site is not a meaningful response to either the City's policy commitment or the Court Stipulations, mandating best practical technology to minimize potential for nuisances in or near the plant. In addition, the shallow water table (approximately 10 feet) at Plant No. 2 could cause potential safety problems with constructing the irradiator, since the main structure of the irradiator will be built underground. A complete site analysis prepared by the City is contained in Appendix E of this Final SEIS.

undeveloped land is apparently available adjacent to the plant. My objections to this alternative can be summarized as:

- a. the large capital expenses,
- b. the large annual O & M expenses which will increase with energy cost rises,
- c. the potential for failures which will interrupt the sludge management system.

A more reasonable alternative would be to purchase land near the existing plant along with additional land to serve as a buffer zone and could be used for agriculture or park land. I recognize that there are substantial political and economic problems associated with this proposal, not the least of which is the perceived odor problem by nearby residents. The concept, and associated problems should be addressed in the SDEIS, particularly in light of significantly improved operations and consequent reduction of odors in the past two years.

The SDEIS bases the comparison of alternatives primarily on economic analyses with brief consideration given to environmental and other consequences. I am firmly convinced that a major selection criteria should be the ability of the Water Resources Department to operate and maintain the system finally selected. As noted above, O & M by the city has substantially improved in recent years, however there remain constraints which limit the degree of sophistication attainable. These include the wage and salary structure and its effect on the ability to attract and retain qualified personnel, as well as the available labor pool. Many examples across the country can be cited of marvelous high technology treatment facilities with miserable performance records due to improper operation by unqualified personnel. The irradiation process, for example, appears to be nearly fool-proof, while other systems considered require constant attention by skilled operators. It is unquestionably difficult to quantify O & M capabilities, yet it is important that these potential limitations be included. Specifically, I suggest that a column be added to the appropriate matrices summarizing the alternatives which refers to O & M sophistication required.

I wish to conclude my comments by stating that I have a fundamental disagreement with the sludge disinfection requirements promulgated by the USEPA. The City of Albuquerque and other cities throughout the nation have a long history of successful application of stabilized sewage sludge on municipal property with no solid epidemiological evidence of health problems that I am aware of. I accept the findings of pathogenic organisms in the sludge, however the present regulations, in my opinion, fail to recognize the additional disinfection which will occur during drying, particularly in open-air drying beds, stockpiling, and

Responses to Comments from Dr. Bruce Thomson, P.E. - Concluded

4. Although EPA recognizes the validity of this statement, the O&M cost indicated for each alternative includes the labor cost that is reflective of the sophistication of the processes involved. During the design phase of this facility an O&M manual which specifies the personnel and training required must be developed by the City and is subject to EPA approval. It is noted however, that EPA has no enforcement authority to ensure that this manual is followed.
5. Comment noted.

finally spreading on parklands. Furthermore, I believe that the mode of infection postulated is unlikely. I do not deny that there are potential hazards, but remain skeptical that there is a serious problem, and I am convinced that disinfection of sludge is not a cost-effective solution to the problem.

5

Thank you for your attention. I look forward to receiving a copy of the Final Environmental Impact Statement.

Sincerely yours,

*Bruce M. Thomson*

Bruce M. Thomson, Ph.D., P.E.  
Environmental Engineer

SIGNATURE PAGE. EPA RESPONSE NOT REQUIRED

cc Water Resources Department



# Federal Emergency Management Agency

Region VI

Federal Center

Denton, Texas 76201

November 20, 1981

Mr. Clinton B. Spotts  
Regional EIS Coordinator  
U.S. Environmental Protection  
Agency (6ASAF)  
101 Elm Street  
Dallas, Texas 75270

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NOV 25 1981

S & A DIVISION

Dear Mr. Spotts:

The following comments are in response to the Draft Supplemental Environmental Impact Statement dated September 25, 1981, for a sludge management system for Albuquerque, Bernalillo County, New Mexico.

1. Albuquerque and unincorporated Bernalillo County are participating in the National Flood Insurance Program (NFIP). The current effective flood map for Albuquerque is dated December 4, 1979, and for unincorporated Bernalillo County is dated January 13, 1981. A recently completed flood insurance study revising the current flood maps for the project will be available late in 1981 or early 1982. This preliminary information should be evaluated for possible impacts on the proposed project.
2. As mentioned in the DSEIS, portions of the project are within the 100-year flood plain. For continued eligibility in the NFIP, Albuquerque and Bernalillo County must ensure that all new construction within the 100-year flood plain be built in compliance with their flood plain management ordinances. This includes new and replacement sanitary sewerage systems which must be designed to minimize or eliminate infiltration of flood waters into the systems and discharges from the systems into flood waters, and onsite waste disposal systems must be located to avoid impairment to them or contamination from them during flooding.
3. Executive Order 11988, Floodplain Management and E.O. 11990, Protection of Wetlands, direct all federal agencies to avoid to the extent possible the long and short term impacts associated with locating in the flood plains or wetlands and to avoid direct and indirect support of flood plain or wetland development.

We hope these comments are helpful. Please let us know if we may be of further assistance by writing or calling (817) 387-5811, extension 271.

Sincerely,

*Cheryl A. Hoke*

Cheryl A. Hoke  
Emergency Management Specialist  
Natural & Technological Hazards  
Division

Responses to Comments from Cheryl A. Hoke  
Natural & Technological Hazards Division, Federal Emergency Management Agency  
Denton, Texas (20 November 1981)

1. The latest available information from the Federal Emergency Management Agency was used in the Draft SEIS. A copy of the flood insurance study currently being conducted by the National Flood Insurance Program will not be available to the public until the summer of 1983 (by phone, Diane Leatherwood, Federal Emergency Management Agency, 13 September 1982).
2. Comment noted.
3. Comment noted.

(404) 262-6649

November 20, 1981

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NOV 23 1981

S. & A DIVISION

Mr. Clinton B. Spotts  
Regional EIS Coordinator  
U.S. Environmental Protection  
Agency (6ASAF)  
1201 Elm Street  
Dallas, Texas 75270

Dear Mr. Spotts:

We have reviewed the Draft Supplemental Environmental Impact Statement (EIS) for the funding of the Step II and Step III Construction Grants for a Sludge Management System, City of Albuquerque, New Mexico. We are responding on behalf of the Public Health Service and are offering the following comments for your consideration in preparing the final document.

#### Vectors

It was indicated that excess sludge stockpiles could result in "mosquitoes and flies which could spread disease." We believe this issue should be better clarified. Has this been a continuing problem with any existing excess sludge stockpiles? The specific mosquito and fly species which have been found breeding in sludge drying areas and stockpiles and which have the capability of causing vector-borne disease problems should be identified in the EIS along with any other public health problems that these vectors might create.

#### Sludge Quality

The EIS should provide additional information on the general quality of sludge generated by the wastewater treatment system and whether it does or could contain chemical constituents that could be harmful to public health if used on public lands and parks. Should gardening or wild-food gathering be prohibited on those lands being benefited with sludge applications?

#### Sludge Disinfection

We believe the regulatory need for sludge disinfection prior to disposal on parks and golf courses should be better clarified. According to the EIS, "new Federal regulations (40 CFR, Part 257.3-6) governing the application of sludge on land prohibit the continued practice of spreading sludge on parks or golf courses without disinfection." However, examination of Part 257.3-6(a) and (b) about disease prevention does not necessarily indicate that sludge applications on parks or golf courses have to be disinfected.

Responses to Comments from Dr. Frank S. Lisella  
Environmental Health Services Division, Center for Environmental Health  
Atlanta, Georgia (20 November 1981)

1. The City currently has no problem with flies and mosquitoes, nor is EPA aware of any documentable evidence of sludge stockpile vector problems in New Mexico. However, since problems have occurred (although infrequently) elsewhere, it is mentioned in the SEIS.
- 2a. Testing was conducted on the sludge for metals and other priority pollutants. The results of these tests indicate that the sludge in the sampling described were within the standards published by the Water Quality Control Commission. All this information supports the position that sludges produced in Albuquerque conform to all applicable State and Federal regulations for land application. EPA toxicity testing has also been conducted and the sludge quality is well within published limits (see Appendix D of this Final SEIS). It is important to note that Albuquerque is implementing an industrial pre-treatment program which will limit heavy metals and toxics in the sludge.
- 2b. The City only has plans to use sludge on turf grasses in the City parks. There are no plans now or in the future to grow food crops on land conditioned by the sludge.
3. 40 CFR Part 257 was written to control sludge application to cropland. Currently, EPA Region 6 is handling sludge applied on non-cropland on a case by case basis. At the onset of this SEIS, EPA determined that disinfection would be required for sludge application on parks for this project.

1

2a

2b

3

Prior disinfection of sludge by gamma ray irradiation (Cesium 137) or other "Process to Further Reduce Pathogens" (Part 257.3-6 Appendix II B) is required only when the sludge is to be applied to land or incorporated into soil which is used to produce crops for direct human consumption within 18 months following application or incorporation. Part 257.3-6(b)(3) states that "if crops for direct human consumption are not grown within 18 months of application or incorporation, the requirements of paragraphs (b)(1) and (2) of this section apply." The (b)(1) paragraph indicates that the application of any sludge to land or to soil requires treatment by a "Process to Significantly Reduce Pathogens." If grazing by animals whose products are used for human consumption cannot be prevented for at least one month and/or if public access to specific application areas cannot be controlled for at least 12 months, would treatment by a "Process to Further Reduce Pathogens" then be required?

Considering the above, an alternative to irradiating sludge and allowing immediate public access to an application area (assuming it meets the other "Criteria for Classification of Solid Waste Disposal Facilities and Practices" Part 257.3) would be to control public access. Could access to specific application areas on the City's parks and golf courses be controlled for at least a year? Please explain what EPA's legal definition is for controlling public access. Would the application area have to be fenced or could it be properly posted and restricted to prevent unsafe public use? The EIS should indicate if the need to require at least 1 year of public access controls to the City's application areas when such areas have become properly stabilized and covered with vegetation is adequately supported by public health studies. Would trenching or burial of sludge on such lands be feasible and/or environmentally sound?

According to the EIS, sludge is a valuable resource for the City of Albuquerque for use on parks and golf courses. While we fully recognize and support the current EPA regulations for disease prevention as specified by 40 CFR Part 257.3-6, should EPA fund a sludge disinfection program so that the City can continue to use sludge for parks and golf courses when other less expensive and environmentally sound alternatives exist? If the City wishes to use the sludge for some special purpose, shouldn't they be responsible for any additional expenses associated with rendering the sludge suitable for that special use?

#### Alternatives

Comparing the cost-effectiveness of optimal alternatives, tables were provided ranking the alternatives with and without credit for utilization of sludge on public lands. Does the credit amount given account for any differences in the quality of sludge (presence of pathogens, heavy metals, etc.) and accessibility to a marketing firm? Would the City of Albuquerque be willing to pay this credit value of \$70/ton if City sludge was unavailable or unsafe to use even after disinfection? Since the "EIS does not include an analysis of the costs or environmental effects associated with sludge handling or management by the Parks Department" (page 5-32), is it appropriate to include credit benefits for using sludge in the alternative analyses (Table 5-14) and exclude direct and indirect costs associated with sludge management and adverse effects?

#### Responses to Comments from Dr. Frank S. Lisella - Continued

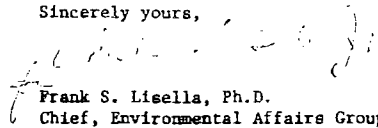
4. EPA currently has not obtained a ruling or interpretation from legal council on the definition of controlling public access. EPA Headquarters staff have interpreted "controlled access" to mean: (1) using chain-link fencing in metropolitan areas; and (2) using barbed-wire fencing in remote, rural areas. Posting is not adequate in either case. The RCRA was adopted by Congress based upon public health information justifying the need for such a law. EPA has not conducted further studies justifying or negating the need for the law. Sludge produced in Albuquerque would be applied to all parks annually, therefore controlling public access for one year would result in the virtual exclusion of the public from all Albuquerque parks. Trenching or burial of sludge in the parks is not feasible; however, landfilling (i.e., trenching or burial) is feasible and has been evaluated in the SEIS (Alternatives 2A and 2B).
5. The City has made several significant changes to their proposed project, as described in Section 3.1 of this Final SEIS. The changes have substantially reduced the estimated cost of the City's proposed project. As indicated in Section 4.3 of this Final SEIS, the City's proposed project is now the most cost-effective, environmentally-sound alternative.
6. After evaluating all available information, EPA determined it appropriate to allow a \$70/ton credit for the use of sludge as a soil conditioner. See Section 4.1 of the Final SEIS for further information. The credit amount is not based upon the variability of quality and marketability of Albuquerque's sludge. The \$70/ton value is specific to the City of Albuquerque project, and may change for other projects. The City will pay \$70/ton for other material, and in fact, currently pays \$225/ton for Milogranite. EPA determined that it is appropriate to allow a credit for sludge and exclude direct and incorrect costs associated with processes (i.e., trucking) outside of the immediate process train (i.e., alternating) being evaluated.

Page 3 - Mr. Clinton B. Spotts

While we recognize that existing roadways were assumed to be used, please explain why a shorter truck haul route was not selected to Rio Puerco. Was any consideration given to the use of the Rio Bravo Bridge and the same route used for the pipeline to Rio Puerco? From Figure 5-2, it appears that the difference between the length of unimproved road to be used in the "Truck Route to Rio Puerco" and the length of unimproved road that could be used along the "Pipeline to Rio Puerco" is minor.

We appreciate the opportunity to review this Draft EIS. Please send us one copy of the final document when it becomes available. Should you have any questions about our comments above, please call Robert Kay of my staff or me at FTS 236-6649.

Sincerely yours,

  
Frank S. Lisella, Ph.D.  
Chief, Environmental Affairs Group  
Environmental Health Services Division  
Center for Environmental Health

Responses to comments from Dr. Frank S. Lisella - Concluded

7. According to the City, there is no shorter truck route to Rio Puerco without necessitating the construction of new roads. The pipeline route to Rio Puerco crosses open lands and does not follow established roadways, therefore this route is not feasible for trucks. The City selected the most feasible and cost-effective routes available for evaluation.

# CITIZENS AGAINST NUCLEAR THREATS



106 GIRARD SE ROOM 121 C  
ALBUQUERQUE, NEW MEXICO 87106  
(505) 268-9657

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DEC 7 1981

S & A DIVISION

December 3, 1981

Responses to Comments from Dorelen Bunting  
Citizens Against Nuclear Threats  
Albuquerque, New Mexico (3 December 1981)

Comments on Environmental Impact Statement, Facilities-Sludge Management System, Albuquerque, N.M.

Although the EIS recommends the sludge irradiator, it does not make a clear and overriding case for the irradiator. Material is presented in a vague and biased manner and all of it is based on information from city officials and city approved consultants who all favor the irradiator.

Major areas dealt with inadequately are:

## Heavy metals and chemicals

These are an important danger to life but the irradiator would not affect these elements. The EIS tries to show these are not a problem in Albuquerque. But figures are not recent and based on extremely scanty sampling. To address this area adequately, the document should tell us what industries are producing heavy metals and chemicals in waste, what pretreatment is given their waste now, and in what way their treatment is monitored for adequacy now and will be monitored in the future.

No up to date information is given as to results of tests for metals and chemicals run on secondary digestors or dry sludge beds. What protection does the public have from these elements getting into ground water or food chain?

## Comparative Costs

If the only function of the irradiator is to render the sludge sterile of pathogens, then it would seem that this could be achieved at far less cost, as admitted by the EIS, by other methods such as wet air oxidation. Since the treatment processes prior to the irradiation are variations of the same, the

odor problems would be the same. In the case of the wet air oxidation process, the use of polymers, an oil product, would be eliminated. The EIS does not indicate the cost of these polymers. And the fact that composting would be 1/3 to 1/2 less expensive is also not reflected in the charts.

Finally, we find no overwhelming case for the potential hazards of the use of millions of curies of Cesium 137 simply to sterilize sludge, with its accompanying complications of a 5 mile pipeline and vaguely described solar drying facilities. On the contrary, it appears mainly to be a contrived justification for the use of an isotope by-product of the production of plutonium for use in nuclear weapons.

Dorelen Bunting  
Citizens Against Nuclear Threats

This is 100% recycled paper.

1. The Draft SEIS did not recommend any alternative or component (e.g., Cs-137 irradiator); however, this Final SEIS does indicate which alternative EPA proposes to fund.
2. The Albuquerque Industrial Pretreatment Program Development manual submitted to EPA on 29 June 1981 summarizes testing of the sludge for metals and other priority pollutant compounds. The data indicate that the sludges in the sampling described were within the standards published by the Water Quality Control Commission. This data is also consistent with earlier test work on sludge quality, summarized in Appendix C of the Balloon Report. All this information supports the position that sludges produced in Albuquerque conform to all applicable State and Federal regulations for land application. EPA toxicity testing has also been conducted and the Albuquerque sludge is well within the limits specified by regulations (see Appendix D). Albuquerque currently is implementing an industrial pretreatment program which was approved by EPA. The details of this pretreatment program are not within the scope of this SEIS which is limited to sludge management systems.
3. Cost for conditioning polymers was included in miscellaneous cost for all appropriate alternatives. The complete costs, including O&M and capital cost, for all alternatives were presented in Table 5-13 and 5-14 of the Draft SEIS. Alternatives 1E and 1F include composting. A revised cost-effectiveness analysis is presented in Section 3.4 of this Final EIS. It is noted that the composting alternatives range from 3% less expensive to 28% more expensive than the City's proposed project, and not 33%-50% less expensive.
4. Comment noted.





# City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

MAYOR  
Harry E. Kinney

CHIEF  
ADMINISTRATIVE OFFICER  
Frank A. Kleinhenz

December 8, 1981

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DEC 14 1981

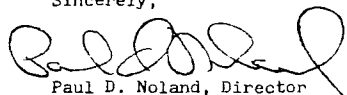
S & A DIVISION

Mr. Clinton B. Spotts  
Regional EIS Coordinator  
USEPA Region VI  
1201 Elm Street  
Dallas, TX 75270

Dear Mr. Spotts:

Enclosed please find comments from Ms. Eileen Grevey Clifford, Chairman of the Water Resources Citizen's Advisory Board, regarding the Draft SEIS document.

Sincerely,

  
Paul D. Noland, Director  
Water Resources Department

PDN:smn

Enc.

TRANSMITTAL LETTER. EPA RESPONSE NOT REQUIRED.

Ms. Eileen Gravey Clifford  
Chairman  
Water Resources Citizen's Advisory Board

Responses to Comments from Ms. Eileen Gravey Clifford  
Chairman, Water Resources Citizen's Advisory Board  
Albuquerque, New Mexico (7 December 1981)

1. Comment noted.

December, 7, 1981

Mr. Paul D. Noland, Director  
Water Resources Department  
City of Albuquerque  
P.O. Box 1293  
Albuquerque, NM 87103

Dear Mr. Noland:

Thank you for providing relevant information to this committee regarding Albuquerque's Sewage Sludge Treatment and disposal alternatives including the City's preferred alternative.

On evaluating the technical and other information provided by the Water Resources Department, this committee concurs that sewage sludge must be treated adequately so that it can be utilized as a soil conditioner/fertilizer on public and private land. The committee feels that re-cycling sludge as a valuable resource, in addition to solving a sludge disposal problem, will accomplish monetary savings for the City through its use on City parks as a soil nutrient.

Realizing some of the inherent safety considerations involved in the beneficial use of sludge and associated liabilities of the City, the committee prefers an alternative which can reliably and consistently render sludge safe for public use.

The technical information provided to this committee on the City's preferred alternative involving pipeline transport of anaerobically digested sludge to Montesa Park for dewatering and disinfection via Gamma-Ray Irradiation before disposal as soil conditioner/fertilizer was evaluated by the committee. The following represents a consensus of the members on this matter.

1. The proposed alternative is consistent with the committee's view regarding beneficial utilization of sludge. The alternative appears to be compatible with today's need for energy conservation.

2. The application of irradiation process in a sensitive field such as medicine and other consumer products would appear to indicate its reliability in insuring the safety aspects of benefiting sludge use.
3. The committee recommends that safety aspects in the handling and use of Cesium-137 isotope be carefully evaluated and appropriate measures taken during design and construction to insure public health and safety.

Once again, we appreciate the opportunity provided to this committee for commenting on the City's Sewage Sludge disposal planning. If you have any questions regarding this letter, we could discuss it during the next monthly committee meeting.

Sincerely yours,

Ms Eileen Grevey Clifford, Chairman  
Water Resources Citizen's Advisory Board

Responses to Comments from Ms. Eileen Grevey Clifford - Concluded

2. Comment noted.
3. The safe handling and use of Cs-137 is of prime importance to EPA as indicated in Section 6.4.3, Section 6.11.3, and Section 10.2 of the Draft SEIS. The licensing process for operation of the irradiator, which will be handled by the New Mexico Environmental Improvement Division, will further assure the safe handling and use of Cs-137.

2800 Charleston, N.E.  
Albuquerque, N.M.  
December 9, 1981

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S & A DIVISION

Mr. Clinton B. Spotts  
Regional E.I.S. Coordinator  
U.S.E.P.A.  
1201 Elm Street  
Dallas, TX 75270

TRANSMITTAL LETTER. EPA RESPONSE NOT REQUIRED.

Re: E.F.A. 906/9-81-003 Draft S.E.I.S.  
Albuquerque Sludge Management  
System

Dear Mr. Spotts:

The purpose of this letter is to clarify the position of the Citizens' Advisory Committee regarding review and comment on the subject draft. On November 17, 1981, the C.A.C. members, Mr. Jay Sorenson, Mr. James Wiegman, Mr. Fred Seebinger, Mr. Gene Martinez, Mr. Stan Read, Mr. Walt Webster, and Ms. Evelyn Oden. The individual comments of Ms. Rosa Grado are also included.

The comments Mr. Khera made on November 11, and which he submitted separately in rebuttal to Mr. Caudill's comments, are not the position of the Citizens' Advisory Committee. I hope that I have cleared up any misunderstanding the E.P.A. may have had regarding the C.A.C. position on this matter.

Please advise if you have any further concerns.

Sincerely,



Jay B. Sorenson, Chairman  
Citizens' Advisory Committee

JBS/LTC/bb

cc: A.K. Khera, Water Resources Dept.  
C.A.C. Members

COMMENTS DRAFT S.E.I.S.  
ALBUQUERQUE SLUDGE MANAGEMENT SYSTEM

Fred Seebinger:

Alternate sites which I believe should be considered include State land lying immediately east of I-25 and north of the Karler Packing Plant and private land lying N.W. of the curve of I-25 where it turns from N-S to E-W just before crossing the Rio Grande. A poultry farm occupies the latter site at present.

Gene Martinez:

Since the nitrate contamination of groundwater at Mountain View is of unknown origin and therefore cannot be separated from the sludge disposal problem the nitrate problem should have been more fully addressed in the Draft S.E.I.S. Alternate approaches/solutions to this most serious problem should have been included in the Draft S.E.I.S.

Stan Read:

The Draft S.E.I.S. is deficient in its consideration of alternate sites for sludge handling facilities, whether federally controlled, state owned or controlled, or in private ownership. Although the need for consideration of alternate sites was raised by the C.A.C. six months ago, no alternatives to Montesa Park were considered. Possible alternate sites include lands at Kirtland Air Force Base, other federal lands, trust lands of the University of New Mexico, other state lands south of Tijeras Arroyo, range lands of the Isleta Pueblo, and private lands of M-1 or M-2 (manufacturing) zoning in the County and away from most areas of human habitation.

Walt Webster:

The Draft S.E.I.S. does not adequately address or consider as an alternative, if in fact sludge handling facilities are to be located at Montesa Park; the use of totally enclosed facilities there (including cost estimates); and the use of no open storage or no open air drying. The Draft S.E.I.S. does not adequately address or consider as an alternative the use of an oversight committee, consisting of representatives of Kirtland A.F.B., UNM, and F.A.A. for purposes of design review and observation of a one year operating period if Montesa Park is utilized as a site for sludge handling facilities.

RESPONSES TO COMMENTS FROM FRED SEEBINGER, GENE MARTINEZ, STAN READ,  
WALT WEBSTER, AND ROSA GRADO, CITIZEN'S ADVISORY COMMITTEE MEMBERS  
ALBUQUERQUE, NEW MEXICO (9 DECEMBER 1981)

1. Alternative sites evaluated by the City are included in Appendix E.
2. The Draft SEIS documents the existence of nitrate contamination of groundwater in the Mountain View community; however, determining solutions to this existing problem are out-of-scope for this SEIS.
3. Alternative sites evaluated by the City are included in Appendix E.
4. Since issuance of the Draft SEIS the City has revised their proposed project to include totally enclosed facilities. Costs for this alteration have been included in Section 3.4 of the Final SEIS. Open storage and open air drying have been deleted from further consideration as it was found to be not environmentally sound.
5. This suggestion merits consideration; however, establishment of such a committee would best be handled on a local level (city/county).

Rosa Grado:

1. The S.E.I.S. has made no mention of specific comments made by some City & County residents objecting to a facility utilizing radioactive material in sludge treatment, (at a scoping meeting, a public meeting and to this committee member in seeking public input on the proposal.)
2. The S.E.I.S. has not addressed the fact that public input has raised concern over the information provided by Sandia Labs as being incomplete, confusing and undocumentable: One reason for this concern is the "Notice" that appears inside the front cover of the Sandia Lab and Batelle documents reviewed that disclaims any liability for the completeness, accuracy etc. of the information provided and the use thereof. A second reason is that an irradiator of the size proposed utilizing Cesium has never been done before except as described by Sandia from their pilot irradiator - citizens object to having their city used as a basis for this experiment. A third reason is that admittedly (SL spokesman) the trucks carrying Cesium will be emitting radiation and unknowingly, persons alongside these vehicles will be exposed. Related is eligibility addressing public and worker health and safety and possible radiation - induced health effects.
3. The S.E.I.S. also does not address at all psychological effects on citizens from the use of a radioactive material in an admittedly experimental facility. Citizens, mothers, potential mothers, young people have expressed to this committee objections to such a facility using radioactive material and other feelings that can be defined as a psychological perspective of a negative nature.
4. I want the S.E.I.S. to completely define "Background Radiation", and to address the discrepancy between their stated level and that of the consultant (Kowal). Background Radiation before atmospheric testing, before uranium mining and milling has been affected greatly towards increased radiation in the atmosphere and water in New Mexico.
5. Address the issue that irradiated sludge had been proposed to be used as a feed supplement for livestock and that we have no guarantee it won't be used as such.
6. I am very concerned that all viable alternatives have not been explored specifically using the sludge to raise fuel crops.

Responses to Comments from Citizen's Advisory Committee Members - Concluded

6. Public comments on the Draft SEIS are included in the Final SEIS.
7. See EPA's response to Question No. 6.
8. Psychological effects, both positive and negative, of all the alternatives is out-of-scope for the SEIS. Public comments and concerns are documented in Chapter 6.0 of the Final SEIS.
9. Background radiation is the naturally occurring radiation in the environment due to cosmic rays, external terrestrial radiation, and internal terrestrial radiation. Dr. J.C. Robertson stated the background radiation in Albuquerque was between 250 and 350 millirems per year (mrem/year). Sandia National Laboratories found the background radiation of Albuquerque to be 200 mrem/year. This difference is not significant and is attributable to the location of the test. For example, if the test was conducted in an area surrounded by concrete, the radiation level would be higher than if the test was conducted in an open area. This discrepancy would be caused by the radioactive content of the concrete.
10. According to DOE, it is illegal under Food and Drug Administration regulations to feed human sewage solids to cattle to be slaughtered for human consumption. This procedure can only be done for experimental purposes. The City's Facilities Plan Amendment has no provision for utilization of sludge as a feed supplement.
11. See EPA's response to Comment 9d in Section 6.4.

DEPARTMENT OF THE AIR FORCE  
AIR FORCE ENGINEERING CENTRAL RECORDS  
DALLAS, TEXAS 75242

ROV

9 December 1981

Supplemental Draft Environmental Impact Statement, Wastewater Treatment Facilities,  
Sludge Management System, Albuquerque, New Mexico

Mr. Clinton B. Spotts, Regional EIS Coordinator  
U.S. Environmental Protection Agency Region VI  
1201 Elm Street  
Dallas, Texas 75270

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DEC 10 1981  
S & A DIVISION

1. We thank you for the opportunity to review and comment on the subject document. Following are technical comments for specific referenced paragraphs:

a. Paragraphs 1.2, 4.2, 5.5.5, and others discussed open-air drying of sludge. The alternatives which include open-air drying of sludge do not consider the possibility of creating an acceptable habitat for breeding of insects. Biodegradable material available in the sludge, coupled with sufficient moisture (35 to 45 percent solids) and warm temperatures would appear to be a likely breeding place for a sufficient number of insects to attract birds. Birds in close proximity to the airport environment pose an unnecessarily high potential for bird/aircraft strikes. The question of sludge creating a habitat for insects at any time of the year should be considered and addressed to a professional entomologist.

b. Paragraph 1.3 discusses the "no action alternative" of continuing to use drying beds and sludge lagoons. The objection to the alternative was discussed in our 1980 BASH report for Kirtland AFB, New Mexico. The main attraction would be that of waterfowl and other birds to the presence of a water source in an arid environment.

c. Paragraph 1.2, 1.3, 4.2, 5.5, 5.5.4, and others discuss landfilling of sludge. Landfill guidelines which should be considered with relation to the attraction of birds are found in the Code of Federal Regulations, Title 40, Part 257.3-8, which states, "a facility or practice disposing of putrescible wastes (solid waste which contains organic matter capable of being decomposed by microorganisms and such a character and proportion as to be capable of attracting or providing food for birds) that may attract birds and which occurs within 10,000 feet of any airport runway used by turbojet aircraft ... shall not pose a bird hazard (increase in the likelihood of bird/aircraft collision that may cause damage to the aircraft or injury to its occupants) to aircraft." The proper question which should be addressed by a professional is whether or not the sludge placed in a landfill could, at any time of the year, attract birds. If that possibility exists, then landfilling operations as proposed in the draft supplemental EIS would be in opposition to the guidelines set forth by the Federal Aviation Administration (FAA) and the Environmental Protection Agency (EPA).

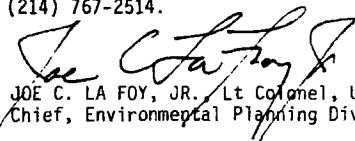
RESPONSE TO COMMENTS FROM JOE C. LA FOY, JR.  
DEPARTMENT OF THE AIR FORCE  
DALLAS, TEXAS (9 December 1981)

1. The attraction of birds due to open air drying or composting was mentioned on page 6-75 of the Draft SEIS. Since the concept of open air drying currently has been dropped from consideration as being environmentally unacceptable (as explained in Section 4.2 of the Final SEIS), additional information regarding insect habitat potential is unnecessary.
2. For this project, the "no action alternative" was addressed per EPA requirements, but was not considered as a viable alternative. The Bird Aircraft Strike Hazard (BASH) report prepared by the US Air Force expressed concern about the attraction of birds to lagoons at Montesa Park. Although the City did at one time propose using sludge lagoons as an interim measure, none of the alternatives for ultimate treatment and disposal of sludge as evaluated in the Draft SEIS proposed the use of lagoons at Montesa Park. At CAC Meeting 17, a member of the Air Force BASH team expressed concern about the attraction of birds to open air drying beds. Since issuance of the Draft SEIS, the City has made certain changes which include: (1) deleting open air drying from consideration; and (2) enclosing all stockpiles. These changes should alleviate concerns over the attraction of birds to the proposed sludge handling facilities.
3. The landfill site evaluated in the Draft SEIS is approximately 11 miles (over 60,000 ft) from the Albuquerque Airport, and thus not in conflict with 40 CFR 257.3-8.

d. Table 3-1 does not reference two important documents concerning solid waste disposal facilities and bird/aircraft strikes: (1) Classifying Solid Waste Disposal Facilities, a Guidance Manual SW-828, March 1980 EPA; (2) FAA Guidance Concerning Sanitary Landfills On or Near Airports, 5200.5, 16 October 1974. Both of these documents discuss in detail the concerns the FAA and EPA have for facilities or practices which could cause an increase in the potential of BASH problems.

4

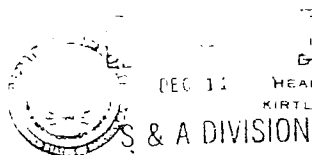
2. We ask that our comments and concerns be addressed in the final EIS. Should you have any questions or concerns, our staff point of contact is Mr. Ed Lopez, (214) 767-2514.

  
JOE C. LA FOY, JR., Lt Colonel, USAF  
Chief, Environmental Planning Division

Response to comments from Joe C. La Foy, Jr. - Concluded

4. Table 3-1 on page 3-5 of the Draft SEIS lists Federal regulations and legislation in lieu of Federal guidelines. However, the comment is valid and these important documents have been added to Chapter 7.0 - Bibliography in this Final SEIS.





DEC 11

DEPARTMENT OF THE AIR FORCE  
HEADQUARTERS 1600TH AIR SUPPORT GROUP (MACI)  
KIRTLAND AIR FORCE BASE, NEW MEXICO 87117

S & A DIVISION

10 DEC 1981

MEMORANDUM FOR DEEV (Ms. Moe, 4-0950)

SUBJECT: Supplemental Draft Environmental Impact Statement, Wastewater Treatment Facilities, Sludge Management System, Albuquerque, New Mexico

TO: USEPA  
Region VI  
First International Building  
1201 Elm Street  
Dallas, Texas 75270

Subject document has been reviewed for technical aspects and environmental impact. Following are technical comments for specific referenced paragraphs:

1. Item 5.2, page 5-8. No action alternative, "Sludge not dried on drying beds would be stored in lagoons." It is not specifically stated whether the lagoons would be at Plant 2.

2. Table 5-7, page 5-12. Does not include FAA airfield criteria and zoning appropriate for airfield environs.

3. Item 5.5.5, Secondary Drying, page 5-28. Bird attraction to insects breeding in the open air drying process of sludge is not addressed.

4. Composting, Table 6-7, page 6-43. No distance estimates are included in this section indicating areas which may be affected by significant odor that could be generated from the sludge.

5. Page 6-73. The first paragraph under "Specific Disposal Sites" refers to Sandia Military Reservation which no longer exists. The Sandia Military Reservation merged in 1971 with what is now Kirtland Air Force Base.

6. Page 6-75. The paragraph referring to possible bird strike hazards is not substantiated by the Bird/Aircraft Strike Hazard Report.

7. Paragraph 6.11.3, page 6-92 and page 6-97. Refer to composting and stockpiling as attracting mosquitoes and flies. These insects would attract birds also, but bird attraction is not further addressed.

8. Paragraph 6.12.3, Environmental Consequences of the Action Alternative, page 6-101. There is no mention of possible bird/aircraft strike hazard.

RESPONSE TO COMMENTS FROM HERBERT C. BOHANNON, JR.  
DEPARTMENT OF THE AIR FORCE  
ALBUQUERQUE, NEW MEXICO (10 December 1981)

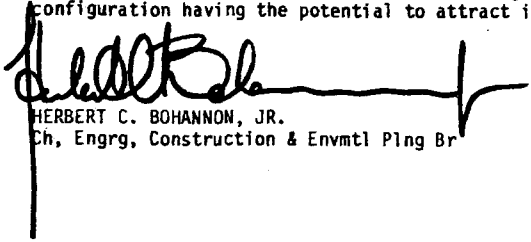
1. The lagoons would be constructed at Plant No. 2, on City property. However, EPA does not consider "no action" as a viable alternative for the subject project.
2. Transportation criteria and zoning criteria were considered in Section 6.8 of the Draft SEIS. Pertinent FAA guidelines have been added to Chapter 7.0 - Bibliography of this Final SEIS.
3. This section simply describes the process, and does not evaluate the effects. Bird attraction to open air drying and composting is addressed in Section 6.8 of the Draft SEIS.
4. Table 6-7 on page 6-43 lists effects that potentially can occur due to the utilization of various processes. Table 6-9 indicates the significance of effects actually expected to occur for various alternatives for the proposed sludge management system. As stated on page 6-49 of the Draft SEIS, distances can not be given because the odors are dependant upon the proper functioning of the plant, wind speed and direction, topography in the same direction, and atmospheric dispersion at the time odors are occurring.
5. Page 6-73 of the Draft SEIS has been changed to reflect this comment. See Chapter 5.0 of this Final SEIS.
6. The report does not appear to document problems associated with composting facilities. The Bird Aircraft Strike Hazard (BASH) report prepared by the US Air Force expressed concern about the attraction of birds to lagoons at Montesa Park. Although the City did at one time propose using sludge lagoons as an interim measure, none of the alternatives for ultimate treatment and disposal of sludge as evaluated in the Draft SEIS proposed the use of lagoons at Montesa Park. At CAC Meeting 17, a member of the Air Force BASH team expressed concern about the attraction of birds to open air drying beds. Since issuance of the Draft SEIS, the City has made certain changes which include: (1) deleting open air drying from consideration as being not environmentally sound; and (2) enclosing all stockpiles. These changes should alleviate concerns over the attraction of birds to the proposed sludge handling facilities.
7. Pages 6-92 and 6-97 address health effects. Bird attraction is not a health effect. Bird attraction was addressed under Transportation on page 6-75 of the Draft SEIS.
8. Page 6-101 addresses recreation and aesthetics, not transportation. See EPA's response to Comment 7.

9. 8.0 Bibliography, page 8-1. The Bird/Aircraft Strike Hazard Report, June 1980, is not included in the bibliography. This report was prepared in July 1980 and given to the City of Albuquerque Water Resources Department.

9

10. The Air Force continues to be concerned with, and opposes any open air processing, to include drying beds, wet drying beds and any other such system configuration having the potential to attract insects, birds, or cause odor.

10

  
HERBERT C. BOHANNON, JR.  
Ch, Engrg, Construction & Envmtl Plng Br

Response to comments from Herbert C. Bohannon, Jr. - Concluded

9. This report was not made available to EPA prior to issuance of the Draft SEIS. The BASH report is referenced in Chapter 7.0 - Bibliography of the Final SEIS.
10. Open air drying and open stockpiles have been determined environmentally unsound, and are not included in the City's currently proposed project.



## City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

MAYOR  
Harry E. Kinney  
  
CHIEF  
ADMINISTRATIVE OFFICER  
Frank A. Kleinhenz

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DEC 14 1981

S & A DIVISION

December 11, 1981

Responses to Comments from Vern C. Hagen  
City of Albuquerque  
Albuquerque, New Mexico (11 December 1981)

1. The City has responded to this comment through a letter from Mr. Frank A. Kleinhenz, Chief Administrative Officer. A copy of this letter is included in Appendix A of the Final SEIS.

Clinton Spotts, Region IV EIS Coordinator  
U.S. Environmental Protection Agency  
1201 Elm Street  
Dallas, TX 75270

Dear Mr. Spotts:

This letter concerns the Draft Supplemental Environmental Impact Statement (SEIS) on the proposed Sludge Treatment Management System for Albuquerque.

Your attention is directed toward the following deficiencies in the Draft Supplement relative to the National Environmental Policy Act, Section 1506.2(d) (possible conflicts between the proposed action and the objectives of state and local land use plans, policies and control for the area); Section 1502.14 (alternatives).

Section 1506.2(d) The proposal analyzed by the Draft SEIS is not in compliance with the Albuquerque/Bernalillo County Comprehensive Plan: The proposal analyzed by the draft is based upon a report (City of Albuquerque, New Mexico, Southside Wastewater Reclamation Plant Number Two - Phase II Expansion Report) which is described on Draft pages 1 - 2 as an official facilities plan amendment. The following four issues are not adequately considered relative to the Comprehensive Plan.

The Draft SEIS does not accurately described the official relationship of this report. The above referenced SEIS Plan element amendment (Phase II Expansion Report) has no official relationship to the City/County Comprehensive Plan. The Phase II Expansion Report has not been locally adopted as an amendment of the Area-Wide Wastewater Collection and Treatment Facilities Plan, an element of the Comprehensive Plan. Amendment of any of the six elements of the Comprehensive Plan requires approval of the County and City Planning Commissions after public hearings, and adoption, after further public hearings, by the City Council and the Board of County Commissioners.

The Draft pages 1-2 also does not accurately describe the official status of the "principal planning document for wastewater collection and treatment for the City of Albuquerque and several outlying areas."

98-6

December 11, 1981

The document, correctly identified in the Draft as the Albuquerque Area-Wide Wastewater Collection and Treatment Facilities Plan was adopted in May, 1977, by both the City and the County as the fifth of six elements of the City/County Comprehensive Plan. It is not, therefore, a free-standing facilities plan.

The proposed project, analyzed by the Draft SEIS, has no official relationship to the City/County Comprehensive Plan. Section 3-19-11, NMSA, 1978, requires Planning Commission consideration of the conformance of specific public works projects to the adopted municipal master plan:

"3-19-11. Legal Status of Master Plan.

- A. After a master plan or any part thereof has been approved, and within the area of the master plan or any part thereof so approved, the approval of the Planning Commission is necessary to construct, authorize, accept, widen, narrow, remove, extend, relocate, vacate, abandon, acquire or change the use of any:

- (1) park, street or other public way, ground, place or space;
- (2) public building or structure; or
- (3) utility, whether publicly or privately owned."

Section 1502.14. The proposal analyzed by the Draft Supplement does not adequately consider alternative methods of sludge treatment, alternative sites, nor fully disclose environmental consequences.

The Draft Supplement does not acknowledge that the proposed project is to be located in an area designated by another City/County Comprehensive Plan element (Plan for Major Open Space) as public open space "to be used for passive recreation, maintenance of scenic areas, preservation of essential resources and other environmental purposes."

These comments are substantive in nature and, therefore, deserve incorporation in the review record of the Draft; further, these comments deserve a response from the Agency in the final SEIS as described in Section 1502.9(b).

Sincerely,

*Vern C. Hagen*

Vern C. Hagen  
Associate Director/Planning

VCH:amc

cc: Barbara Stephenson, Legal Department  
Carl Rodolph, Municipal Development Department  
Larry Caudill, Municipal Development Department  
Paul Noland, Water Resources Department

Responses to Comments from Vern C. Hagen - Concluded

2. One new alternative (including thermal conditioning under the disinfection component) has been included in the Final SEIS. An analysis of alternative sites which were considered by the City is presented in Appendix E of the Final SEIS. The environmental consequences have been re-evaluated based on data and mitigative measures that recently have been provided by the City, and are included in Section 3.2 of the Final SEIS.
3. The text in the Draft SEIS has been changed. The steps the City will take to rectify this inconsistency with the Comprehensive Plan are included in Section 3.1 of the Final SEIS.

STAN READ

(505) 842-6060

620 ROMA N.W.  
ALBUQUERQUE N.M. 87102

December 14, 1981

Clinton B. Spotts, Regional EIS Coordinator  
US Environmental Protection Agency (6ASAF)  
1201 Elm St.  
Dallas, TX 75270

Attn: Darlene Owsley

Re: DEIS, Albuquerque, NM Sludge Management  
System and Public Participation Process

Dear Mr. Spotts:

This letter presents the most fundamental insufficiencies in the DEIS for this project for inclusion in the comments on the DEIS and consideration in the Final EIS.

Additionally, the comments of the CAC are included herein by reference except as they may conflict with the insufficiencies specifically cited in this letter.

The DEIS is not sufficient in the following:

1. the DEIS does not contain and the CAC and the public have never received a design plan, specific in detail, of the City's preferred alternative;

2. the DEIS does not consider adequately alternative siting for any disinfection alternative;

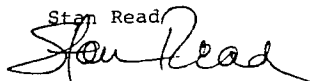
3. the DEIS does not include the independent appraisal or cost analysis of the systems included in the DEIS as supplied to the EPA and the City in mid-November, 1981;

4. the DEIS does not include an adequate mitigation and safety analysis of the options or sites;

5. the DEIS does not include a sufficient treatment of the alternatives to the City's preferred alternative, specifically electron-beam irradiation and thermal conditioning;

6. the DEIS does not provide documentation of the value of sludge for land application.

Furthermore, concerning the Public Participation process and the role of the CAC, I believe that the EPA (Dallas) and the City were seriously remiss in failing to provide the CAC and the public with two reports from Priede-Sedgwick before the December 9, 1981, meeting of the CAC, especially the Priede-Sedgwick independent evaluation of October 14, 1981. They should be included in the Final EIS.

Stan Read  


RESPONSE TO COMMENTS FROM STAN READ  
MEMBER, CITIZEN ADVISORY COMMITTEE  
ALBUQUERQUE, NEW MEXICO (14 December 1981)

1. A somewhat more detailed description of the City's currently proposed project is given in Section 3.1 of this Final SEIS. Specific design plans will be developed and approved by EPA prior to issuance of a construction grant.
2. A new analysis of alternative sites, prepared by the City, is included in Appendix E of this Final SEIS.
3. The Draft SEIS was issued in September 1981. Additional analyses conducted by Priede Sedgwick, Inc. are contained in the public information depositories established for this project.
4. Mitigation measures included in the City's currently proposed project are described in Section 3.1 of this Final SEIS. A site analysis is included in Appendix E.
5. Electron-beam irradiation is explained thoroughly in Appendix 10.3 of the Draft SEIS. Thermal conditioning is described in Section 3.3 of this Final SEIS.
6. EPA determinations regarding sludge value are explained in Section 4.1 of this Final SEIS.
7. EPA provided the reports to the City upon receipt. Both Priede Sedgwick reports are now contained in the public information depositories established for this project.

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7

88-9

## 6.6 MAILING LIST FOR FINAL SEIS

Listed in Table 6.3 on the following page are government offices and public interest groups which will receive a copy of the Final Supplemental EIS. In addition, members of the Citizen's Advisory Committee and individuals who made oral and/ or written comments on the Draft SEIS will receive a copy of the final document.

Table 6-3. Mailing list for the Final SEIS on the proposed City of Albuquerque sludge management system.

Federal Agencies

Advisory Council on Historic Preservation  
Federal Emergency Management Agency  
Kirtland AFB  
Representative Manuel Lujan  
Senator Harrison J. Schmitt  
Senator Pete Dominica  
US Department of Housing and Urban Development  
USDA Soil Conservation Service  
US Department of Energy  
US Department of Health and Human Services  
US Department of Interior (USDOI)  
USDOI Fish and Wildlife Service  
US Department of Transportation Federal Aviation Administration

State Agencies

Environmental Improvement Division  
Office of the Governor  
Representative Kiki Saavedra  
State Engineers Office  
State Historic Preservation Officer  
State Planning Office

Public Interest Groups

Citizen Against Nuclear Threat  
League of Women Voters  
New Mexico Citizens for Clean Air and Water  
Sierra Club  
Southwest Research and Information Center  
Southwest Valley Area Council

# **CHAPTER 7**

## **BIBLIOGRAPHY**



## 7.0 BIBLIOGRAPHY

Presented below is the list of references utilized in the preparation of the Final SEIS, in addition to the ones listed in the Draft SEIS:

CH<sub>2</sub>M Hill. 1982. Innovative and alternative technology assessment for the sludge management system. Phase II expansion program. Albuquerque NM, variously paged.

Federal Aviation Administration. 1974. FAA Guidance concerning sanitary landfills on or near airports (5200.5). Washington DC, variously paged.

International Atomic Energy Agency. 1979. Radiation -- A fact of life. Vienna Austria, variously paged.

Khera, A.K. 1982. Letter, Ashok Khera, City of Albuquerque Water Resources Department, to Stephen Romanow, US Environmental Protection Agency, Region 6, 15 January 1982, 4 p.

Khera, A.K. 1982a. Letter, Ashok K. Khera, City of Albuquerque, to Darlene Owsley, US Environmental Protection Agency, Region 6, 31 March 1982, 1 p.

Long, G.L., and J. Kent. 1980. Kirtland AFB Bird/Aircraft Strike Hazard Assistance Report (BASH). Prepared for Department of Air Force, Tyndall Air Force FL, 4 p.

US Environmental Protection Agency. 1979h. Program requirements memorandum 79-8/identifying expensive projects. Memo from John T. Rhett to Regional Administrators, 9 May 1979, Washington DC, 10 p.

US Environmental Protection Agency. 1980q. Guidance manual SW-828, Classifying solid waste disposal facilities. Washington DC, variously paged.

US Environmental Protection Agency. 1981. Draft supplemental environmental impact statement, wastewater treatment facilities -- sludge management system, Albuquerque, New Mexico. Dallas TX, variously paged.

# **APPENDICES**

# **APPENDIX A**

## **SIGNIFICANT CORRESPONDENCE**



RECEIVED OCT 9 7 1981

Department of Energy  
Albuquerque Operations Office  
P.O. Box 5400  
Albuquerque, New Mexico 87115

OCT 5 1981

Ms. Dawn Davenport-Johnson  
WAPORA, Inc.  
8515 Greenville Avenue, Suite N-205  
Dallas, TX 75243

Dear Ms. Davenport-Johnson:

This letter is to clarify Neil Hartwigsen's response to your question in a recent telephone conversation about the cesium-137 source size for the proposed Albuquerque sludge irradiator. As you are aware, Appendix E of the Phase II B expansion plan report estimates a source size of about 5 MCi for a 25 ton/day facility. Note that this is 25 gross tons per day, independent of solids content.

In the updated economic analysis furnished by the city of Albuquerque to EPA dated July 2, 1981, a capacity of 29.4 dry tons of sludge per day at 40% solids is assumed. This translates into 73.5 gross tons. This capacity would require a source size of about 14.5 MCi which is consistent with Mr. Hartwigsen's estimate of 15 MCi.

Since required source size is determined by the gross tonnage of sludge to be processed per day, rather than by dry tonnage, solids content has a strong influence on source size. The actual source size for an irradiator if Albuquerque proceeds with this option, is uncertain at present because the City has not completed detailed analyses and designs which fix the solids content of the sludge to be irradiated.

I hope this clarifies Mr. Hartwigsen's response adequately. If you have further questions, please contact me at 505-846-5236.

Sincerely,

W. H. McMullen  
Project Manager  
Sewage Sludge Irradiation Program

See page 2 for cc:

Ms. Davenport-Johnson

cc:

A. K. Khera, Water Resources Dept.

M. L. Kramm, 4540, SNLA

B. D. Zak, 4544, SNLA

J. S. Sivinski, 4545, SNLA

C. C. Hartwigsen, 4544, SNLA

D. Owsley, (6ASAFP) USEPA



REC-100  
WATER RESOURCES

Department of Energy  
Albuquerque Operations Office  
P.O. Box 5400  
Albuquerque, New Mexico 87115

Mr. Paul D. Noland, Director  
Water Resources Department  
505 Marquette NW  
Albuquerque, NM 87103

NOV 6 1981

Dear Mr. Noland:

After our discussion in Detroit, I felt clarification of some of DOE's plans would be helpful to you.

As you know, DOE/ALO and the City signed a Cooperative Agreement last year for the transfer of sewage sludge gamma irradiation technology to the City. This Agreement committed DOE to providing gamma sources and technical assistance to Albuquerque. This assistance was predicated on the approval of gamma irradiation as the preferred sludge disinfection method by the City and EPA through the Environmental Impact Statement process.

I understand that a draft EIS has been published and that a Record of Decision is expected in March 1982. If the City pursues gamma irradiation, DOE intends to provide the assistance outlined in the Cooperative Agreement. In fact, the Agreement was recently extended to continue our commitment.

Furthermore, because it appears that the DOE Byproducts Utilization Program may be expanded in FY 82, DOE could possibly provide additional support to the City through modifications to the Cooperative Agreement. Such additional support could include providing detailed designs of an Albuquerque irradiator and funding the City for construction of the facility. In this event, DOE could contribute up to 85% of the construction cost of the irradiator, particularly if the City receives no EPA Construction Grants funding.

Given expanded DOE funding and additional support to the City, I anticipate design of an irradiator for Albuquerque could be available by the end of CY 82 and that construction under City management and administration could begin in early CY 83. Therefore, the operation of a facility which will disinfect Albuquerque sludge to levels required by current regulations, could commence in mid-1984.

P. Noland

I hope the above has given you a better understanding of DOE plans and goals. I can't emphasize enough that everything is contingent upon DOE funding from Congress. The DOE is currently operating under a Continuing Resolution which severely limits its ability to undertake new commitments. When this situation is resolved, my staff will contact your staff to discuss in more detail the plans regarding Albuquerque in FY 82.

If you have any questions regarding this matter, please give me a call.

Dennis L. Krenz  
Director, Energy Research  
& Technology Division

cc:

W. C. Remini, NE-320, DOE, HQ



December 22, 1981

Mr. W. H. McMullen  
Department of Energy  
Albuquerque Operations Office  
P. O. Box 5400  
Albuquerque, NM 87115

Dear Bill:

At your request I attended a briefing of EPA personnel in Dallas, Texas on December 21, 1981. Also in attendance were Gary Yeager (SNL), A. K. Khera (City of Albuquerque) and John Burgh (Camp Dresser and McKee, Inc.). I gave a brief summary of NMSU's agronomic research and detailed our experience regarding the iron (Fe) value of sewage sludge. The following is a summary of my presentation for your files.

EPA personnel also shared a copy of a letter from the Soil Conservation Service (Ray Margo, Jr., State Conservationist) with me and asked for some clarification of agronomic discussion. As a service to EPA, I have also addressed these issues.

#### Iron value of sewage sludge

Iron availability on the calcareous, high pH soils of the southwestern United States is often very low due to precipitation as insoluble iron oxides. This extremely limited availability is often manifested in iron chlorosis of various crops, ornamentals, and turf grasses. Inorganic Fe fertilizers are typically ineffectual in correcting Fe deficiencies as the released Fe ions are quickly precipitated as insoluble Fe oxides. Complexed Fe forms, on the other hand, either as synthetic Fe chelates or as natural organic complexes of Fe, are not subject to the same rapid precipitation reactions. Complexed Fe thus remains available for plants if the complex is stable enough. The most effective synthetic Fe chelate on severely Fe-deficient soils is acknowledged to be FeEDDHA (commercially marketed by CIBA-GEIGY as Chel 138). Unfortunately, Chel 138 is very expensive (~\$250/lb Fe), and its use is often restricted to small scale applications. Greenhouse studies conducted by B. D. McCaslin and Vicente Lee Rodriguez showed sewage sludge applied at 15 tons/A to give statistically the same yields as 5lb Fe/A when the Fe was added as FeEDDHA. The available Fe content of Albuquerque sludge is 166 ppm. Thus, when 15 tons of sludge are applied per acre, the available Fe added is 0.166 lbs available Fe/10<sup>3</sup> lbs sludge x 30 x 10<sup>3</sup> lbs sludge/A = 4.98 lb available Fe/A. Thus, 15 tons of sludge yields essentially the same amount (4.98 lb) of



Mr. W. H. McMullen

December 22, 1981

Page two

available Fe as 5 lb/A of Fe EDDHA. Given this equivalence of action, one can assign a fertilizer value to the sludge equal to that of FeEDDHA. On a per ton basis:  $0.166 \text{ lb}/10^3 \text{ lbs} \times 2 \times 10^3 \text{ lb} \times \$250/\text{lb Fe} = \$83/\text{ton}$  of sludge as an economic value of the sludge based only on the available Fe content.

One can also calculate a fertilizer value of sludge based on its N and P contents as follows:

2% N in sludge at  $\$0.30/\text{lb N} \times 2 \times 10^3 \text{ lb}/\text{ton} = \$12.00$  for N/ton sludge

2.5% P " " "  $\$0.21/\text{lb P} \times " " " = 10.00$  for P/ton sludge

When the N and P values are added to the Fe value, the sludge is seen to have an approximate value of \$100/ton.

It is also important to consider recent projections of fertilizer costs in 1985 (Fertilizer Progress, 1981 Vol 12:14). These conservative projections estimated all fertilizer costs to increase about 2.5 fold from 1980 costs. Thus, by 1985, the sewage product could be worth about \$250/ton based solely on N, P, and Fe elemental composition. We are truly dealing with a product that is too valuable to throw away.

#### SCS letter (copy attached)

In paragraph #4 of page one of the letter, SCS personnel suggest that application of sewage sludge at about 5 ton/A will necessitate additional watering requirements to meet additional N additions. What they were not aware of was the fact that the current watering scheme the city uses has been determined for grass already treated with sewage sludge. I do not know how much sludge is currently being applied, but suspect that it is near the intended 5 ton/A rate. Thus, additional watering is not necessarily needed. These comments also pertain to paragraph #1 on page 2 which suggest that more irrigation water will move soluble salts to a greater depth in the profile.

Paragraph #4 on page 2 addresses the value of sludge and compares sludge to steer manure. This comparison assumes equal nutrient content of the materials which is generally not true. Steer manure averages only 1.34% N and 0.53% P compared with Albuquerque sludge at 2% N and 2.5% P. Steer manure is also much lower in micronutrients especially Fe (0.5%) compared to sludge (1.5%). Field studies at Artesia showed manure to be much less effective in promoting sorghum growth than equal rates of sewage sludge.

Mr. W. H. McMullen  
December 22, 1981  
Page three

Bulk manure is also not treated to "further reduce pathogens" and thus would not be allowed on turf areas. Even the value given "heat-treated" and bagged steer manure ignores the lower nutritional value of steer manure. I trust that these comments are helpful and sufficiently clear. However, if you need additional information, please feel free to contact me.

Sincerely,



George A. O'Connor  
Professor of Soil Chemistry

tb

cc: Gary Yeager



# City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

## MAYOR

Harry E. Kinney

## CHIEF ADMINISTRATIVE OFFICER

Frank A. Kleinhenz

January 6, 1982

Clinton Spotts, EIS Coordinator  
USEPA Region VI  
1201 Elm Street  
Dallas, Texas 75270

SUBJECT: COMMENTS/DECEMBER 11, 1981 LETTER FROM ALBUQUERQUE PLANNING DIRECTOR

Dear Mr. Spotts:

The purpose of this letter is to detail the City of Albuquerque's position relative to the draft Supplemental Environmental Impact Statement (SEIS) on the Phase II Expansion Program Report, and in particular clarify those points previously raised in the letter from the City's Planning Director, Vern C. Hagen, dated December 11, 1981.

In the referenced letter Mr. Hagen correctly points out that the Area-Wide Wastewater Collection and Treatment Facilities Plan is an element of the Albuquerque/Bernalillo County Comprehensive Plan, and that the Southside Wastewater Treatment Plant Phase II Expansion Program Report must be officially adopted through the Planning process before it becomes part of the Comprehensive Plan.

The timing of the proposed Facilities Plan amendment (Phase II Expansion Report) could occur in one of two ways: (1) prior to the release of the Final SEIS with appropriate language stipulating adoption by local governing bodies; or (2) subsequent to the release of the Final SEIS publication with similar stipulations. Discussions with members of the City and County Commissions in a Study Session will be held in the immediate future as a prelude to formal introduction of the Report as an amendment to the Comprehensive Plan's Wastewater Facilities Plan element.

It must be pointed out that a member of the City Environmental Planning Commission and a member of the County Planning Commission served as members of the CAC SEIS. In previous action the City's Environmental Planning Commission (EPC) did approve rezoning for the Montessa Park Site for a permanent sludge treatment facility, conditioned on final approval of a site development plan.

Various sludge treatment alternatives, site alternatives, and environmental consequences will be addressed in the Final SEIS through a cooperative effort of the City's Planning Division, Water Resources Department, the City's consultant (Camp Dresser & McKee, Inc.) and WAPORA, Inc. These alternatives will be submitted as part of the total package to the City and County Planning Commissions and their governing bodies for adoption into their comprehensive plan.

January 6, 1982

The following comments should be included in the content of the Final SEIS:

- A. That the Final SEIS acknowledge the status of the Phase II Expansion Program Report. Specifically, the final sentence on Pages 1-2 would read as follows:

The final version of this report was completed during January 1981 and was forwarded to EPA as a proposed facilities plan amendment on January 21, 1981.

This section should further state that relative to the Albuquerque/Bernalillo County Comprehensive Plan "The City has initiated the review process required to formally amend the Comprehensive Plan's Facilities Plan element by adopting the Phase II Expansion Program Report as an amendment." The Report will achieve official status by adopting it as an amendment of the Comprehensive Plan.

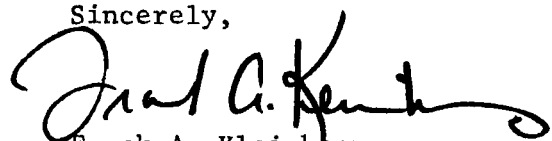
- B. The final SEIS should indicate that:

1. The Phase II Expansion Report must be adopted as an amendment of the Comprehensive Plan's Wastewater Facilities Plan element. It must also be adopted by other local governments in the planning area prior to initiation of the preliminary design phase.
2. The City of Albuquerque will maintain an EIS and SEIS Record documenting compliance with these stipulations.

Please consider this letter as a supplement to Vern Hagen's letter of December 11, 1981 referenced above.

Thank you for your consideration, and if you have further questions or require additional information or explanation, the City will respond through my office.

Sincerely,



Frank A. Kleinhenz  
Chief Administrative Officer

FAK:PDN:rmn

cc: Carl P. Rodolph, Director, MDD <sup>art</sup>  
Terence L. Nighbert, CIP Official, MDD/CIP  
Vern C. Hagen, Associate Director/MDD Planning  
Paul Noland, Director, WRD

# **APPENDIX B**

## **COST-EFFECTIVENESS ANALYSIS**

Cost-effectiveness analysis of optimal alternatives, with a credit (10,740 ton/yr. at \$70/ton) given for utilization of sludge on public parks.

Alters.	Capitol Cost		Annual O&M	PW O&M (10.2921)	Salvage Value	PW Salvage Value (0.2410)	Total PW	Total Annual Equivalent (0.0972)	Cost Per Ton	Rank- ing
	Grant Eligible	Ineligible								
1A*	25,699,100	0	17,400	179,100	2,030,100	489,300	25,388,900	2,467,800	230	8
1B*(1)	26,427,100	80,000	(224,800)	(2,313,700)	4,092,000	986,170	23,207,200	2,255,700	210	3
1C*	22,872,600	0	119,300	1,227,800	597,000	14,400	24,086,000	2,341,200	218	4
1D*	23,600,600	80,000	(122,900)	(1,264,900)	2,659,500	640,900	21,774,800	2,116,500	197	1
1E*	19,063,500	0	496,900	5,114,100	(2,722,900)	(656,200)	24,833,800	2,413,800	225	6
1F*	19,791,500	80,000	204,700	2,209,100	(661,000)	(159,300)	22,239,900	2,161,700	201	2
1G*	22,817,500	0	273,800	2,818,000	523,100	126,100	25,509,400	2,479,500	231	10
1H*	23,545,500	80,000	316,000	3,252,300	2,585,000	623,000	26,254,800	2,552,000	238	11
2A(2)	16,622,200	0	770,000	7,925,900	1,785,800	43,000	24,505,100	2,381,900	222	5
2B	18,383,400	0	640,200	6,589,000	2,601,900	62,700	24,909,700	2,421,200	225	7
3A	29,188,700	0	558,600	5,749,200	9,475,700	228,400	34,709,500	3,373,800	314	14
3B	31,382,700	165,500	103,306	1,063,200	13,103,000	315,800	32,295,600	3,139,100	292	13
3C	28,719,300	212,500	264,900	2,726,400	8,084,800	1,948,500	29,709,700	2,887,800	269	12
3D	25,688,200	0	657,600	676,800	3,893,000	938,200	25,426,800	2,471,500	230	9

\* Potentially eligible for 85% Federal funding.  
(1) Alternative 1B is the City's proposed project.

(2) Most cost-effective conventional system.

Potential funding of optimal alternatives.

<u>Alternatives</u>	<u>Total Capitol Cost Eligible For Funding</u>	<u>EPA Funding 75/85%</u>	<u>State Funding 12.5%</u>	<u>Total Funding</u>	<u>Capitol (Local Share) + Ineligible Funding</u>
1A*	25,699,100	21,844,200	3,212,400	25,056,600	642,500
1B*	26,427,100	22,463,000	3,303,400	25,766,400	660,700 + 80,000
1C*	22,872,600	19,441,700	2,859,100	22,300,800	571,800
1D*	23,600,600	20,060,500	2,950,100	23,010,600	590,000 + 80,000
1E*	19,063,500	16,204,000	2,382,900	18,586,900	476,600
1F*	19,791,500	16,822,800	2,473,900	19,296,700	494,800 + 80,000
1G*	22,817,500	19,394,900	2,852,200	22,247,100	570,400
1H*	23,545,500	20,013,700	2,943,200	22,956,900	588,600 + 80,000
2A	16,622,200	12,466,700	2,077,800	14,544,500	2,077,700
2B**	18,383,400	12,466,700	2,077,800	14,544,500	3,838,900
3A**	29,188,700	12,466,700	2,077,800	14,544,500	14,644,200
3B**	31,382,700	12,466,070	2,077,800	14,544,500	16,838,200 + 165,500
3C**	28,719,300	12,466,700	2,077,800	14,544,500	14,174,800 + 212,500
3D**	25,688,200	12,466,700	2,077,800	14,544,500	11,143,700

\*Potentially eligible for 85% funding.

\*\*Funding limited by most cost-effective conventional system.

# **APPENDIX C**

## **REVISED COST INFORMATION**





# City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

MAYOR  
Harry E. Kinney

CHIEF  
ADMINISTRATIVE OFFICER  
Frank A. Kleinhenz

RECEIVED MAR 29 1982

March 22, 1982

Mr. Steven R. Rubin  
Project Engineer  
Construction Grants  
USEPA Region VI  
First International Bldg.  
1201 Elm Street  
Dallas, TX 75270

Subject: Albuquerque Sludge Management System SEIS

Dear Mr. Rubin:

As suggested by Mr. Varnell of WAPORA in our most recent meeting in the Region VI office, we have undertaken a more detailed scrutiny of costs for the City's preferred system (dewatering, solar drying, and ultimate resource recovery) and the landfilling alternative. Conclusions drawn from this more detailed examination of the components in these alternatives have led to adjustment of certain costs, which in the earlier planning-level studies appear to have been excessively conservative. Following are general observations on these items:

## Belt Press Dewatering

Earlier estimates were based on providing a two-story structure for the belt press installation. More detailed engineering evaluation suggests that a single story structure would in fact be more appropriate for this design application, irrespective of whether located at the plant or at Montesa Park. The revised estimates herein reflect the resulting reduction in building superstructure costs. Further, discussion with manufacturers indicates that a washwater reclamation feature of acceptable performance can be provided as an integral part of the equipment, with resulting increase in equipment cost of less than 10 percent. Since this approach is more cost-effective than providing the separate washwater installation previously envisioned, we have deleted the latter in favor of equipment costs slightly higher to reflect inclusion of this feature. We have also re-examined the operating and maintenance labor requirements in light of the foregoing as well as a review with respect to overall size of the present plant staff. From this review, we have concluded that we were rather too conservative in estimating labor requirements. Appropriate adjustments have been made in the belt press staffing costs. The effect of these combined considerations is to appreciably reduce the cost for belt press dewatering.

### Horizontal Greenhouse Drying

We have pursued a more refined layout of the greenhouse and covered sludge stockpile structures. In order to accommodate desirable interior roadways, but preserve the direct-gain solar area required, the greenhouse has been lengthened slightly. The planning studies assumed agricultural type manure spreading equipment to place the belt press cake on the beds. This has now been replaced by electrically operated equipment for conveyance of the sludge to and from the beds, and for cake mixing, all resulting in a net savings in vehicle investment and energy costs. The savings and costs in these adjustments are roughly offsetting, and the overall process cost remains essentially as provided you previously. However, we are pleased to note that the site plan we are developing permits all truck loading and other handling operations to be conducted within the greenhouse or stockpile buildings, which we think is a further enhancement from an environmental point of view.

### Landfilling

We have reviewed our filter press unit process costs, and have validated the earlier assumptions and their costs. However, the adjustments in belt press costs discussed above result in belt pressing now becoming competitive with filter pressing for ultimate disposal by landfilling. Since the resulting process train costs for belt pressing or filter pressing followed by trucking to landfill are quite close (\$133 and \$136/ton, respectively), the selection between these two methods would likely be made on considerations of ease of operation at the plant, or bacteriological quality of the sludge deposited in the landfill. The lime conditioning involved in filter pressing renders the sludge more inert as regards the potential for bacteriological contamination of groundwater, and renders it a somewhat more benign product in transit across the city. On the other hand, belt presses require somewhat less operation and maintenance resources at the plant.

As will be seen from the enclosures, the results of this more detailed engineering study of the most favored alternatives is that the cost of the City's preferred option is well within 10 percent of what we judge the lowest cost alternative.

As I mentioned in our earlier correspondence, we have developed a conceptual site plan illustrating in general way how the proposed facilities could be positioned on the Montesa Park site. A copy of this layout is being forwarded under separate cover for your information. A corresponding architectural rendering of the facilities is being prepared, and will be furnished to you as soon as completed.

continued  
Steven R. Rubin  
Page 3

We hope the enclosed material is useful, and that you will find it a contribution to moving the SEIS to a successful completion. As you know, we have already provided a large portion of the additional information desired by WAPORA to aid them in responding to draft SEIS comments. In the interim, if we may provide any further explanation of the enclosures, or in any other way assist you or WAPORA, do not hesitate to call.

Sincerely yours,



Ashok K. Khera, P.E.  
Water Resources Department

AKK/lr

Enclosures

cc: James C. Varnell  
Paul D. Noland  
Walter H. Nickerson  
John A. Burgh  
Edward C. Stokes  
Kenneth C. Adams  
Darlene Owsley  
Scott Ahlstrom  
f/  
f/reader's

Table 1

## SUMMARY COSTS OF ALTERNATIVES

Ranking	Process Train Alternative Process Composition*	Cost	
		& Per Dry Ton	Percent of Lowest
1**	Pipe to MP (21), belt press to 25% (65), open-air dryer to 40% (51), gamma irradiate (39), to parks (-70)	106	100
2	Pipe to MP (21) belt press to 20% (62), roll press (51), gamma irradiate (39), covered stockpile (     to parks (-70)	111	105
3**	Pipe to MP (21), belt press to 20% (62), compost (99), to parks (-70)	112	106
4	Pipe to MP (21), belt press to 25% (65), horizontal greenhouse & stockpile to 40% (59), gamma irradiate (39), to parks (-70)	114	108
5	Belt press to 25% (65), truck to landfill (68)	133	125
6	Filter press to 35% (90), truck to landfill (46)	136	128
7	Pipe to MP (21), belt press to 25% (65); vertical greenhouse & stockpile to 40% (81), gamma irradiate (39), to parks (-70)	136	128
8	Pipe to Pajarito site (42), inject in DLD scheme (133)	175	165
9	Pipe to Rio Puerco site (66), inject in DLD scheme (119)	185	175

\* Numbers in parentheses are cost, in dollars per dry ton, or respective components.

\*\* Alternatives strongly disapproved by CAC, on environmental and aesthetic considerations.

MP= Montesa Park

Table 2  
SUMMARY OF COSTS OF UNIT PROCESSES

<u>FUNCTION</u>	<u>TABLE No.</u>	<u>UNIT PROCESS/COMPONENT</u>	<u>COST PER TON DRY SOLIDS</u>
Transport	3	Pipeline to Montesa Park	\$21.40
	4	Pipeline to Pajarito DLD Site	41.73
	5	Pipeline to Rio Puerco DLD Site	65.62
	6	Truck Liquid to Montesa Park	41.20
	7	Truck Liquid to Pajarito Site	70.69
	8	Truck Liquid to Rio Puerco Site	81.95
Dewatering	9	Filter Press (3 to 35% Solids*)	89.97
	10	Belt Press (3 to 20% Solids)	62.19
	11	Belt Press (3 to 25% Solids)	65.15
Drying	12	Open-Air Dryer (25 to 40% Solids)	50.89
	13	Roll Press (20 to 40% Solids)	51.32
	14	Vertical Greenhouse & Open Stockpile (25 to 40% Solids)	81.15
Disinfection	15	Electron-beam Irradiation	56.21
	16	Gamma-ray Irradiation	38.94
	17	Composting	99.21
Disposal	18	Truck Filter Press Cake to Landfill	46.11
	19	Inject Sludge at Pajarito DLD Site	133.23
	20	Inject Sludge at Rio Puerco DLD Site	118.60
Miscellaneous	21	DAF Sludge Thickening	58.63
	22	Truck Belt Press Cake to Landfill	68.03
	23	Horizontal Greenhouse and Enclosed Stockpile (25 to 40% Solids)	58.99
	24	Enclosed Stockpile	9.59

\* i.e. process input is at 3% solids, process output is 35% solids.

Table 10

COST OF BELT PRESS FACILITY TO  
DEWATER FROM 3% to 20% SOLIDS

## ITEM

Construction Costs:	
Building . . . . .	\$ 660,000
Belt Presses . . . . .	1,255,000
Support Systems . . . . .	173,000
Subtotal . . . . .	2,098,000
Contingencies (15%) . . . . .	314,700
Subtotal . . . . .	2,412,700
Field Exploration* . . . . .	-0-
Land Acquisition . . . . .	-0-
Design Engineering (6%) . . . . .	144,800
Engineering During Construction (5%) . . . . .	120,600
Administration and Legal (4%) . . . . .	96,500
Startup (1.5%) . . . . .	36,200
Capital Cost . . . . .	2,810,800
Present Worth of Salvage Values (Buildings) . . . . .	-79,500
Present Worth of Capital Cost . . . . .	2,731,300
<u>Annualized Capital Cost</u> . . . . .	265,400
Fixed Annual O&M Costs:	
Labor (5,000 m-h) . . . . .	49,500
Power (15,600 m-h) . . . . .	1,100
Variable Annual O&M Costs	
to Process 30 TPD:	
Labor (9,970 m-h) . . . . .	98,700
Power (140,400 Kwh) . . . . .	9,600
Polymer (107,300 lb) . . . . .	214,600
Maintenance & Repair Materials . . . . .	29,000
<u>Annualized O&amp;M Cost</u> . . . . .	402,500
<u>TOTAL ANNUALIZED COST</u> . . . . .	667,900
Annual Cost Per Ton Dry Solids . . . . .	\$62.19

\* Included w/drying facilities.

Table 11

COST OF BELT PRESS FACILITY TO  
DEWATER FROM 3% to 25% SOLIDS

<u>ITEM</u>	
Construction Costs:	
Building . . . . .	\$ 660,000
Belt Presses . . . . .	1,510,000
Support Systems . . . . .	173,000
Subtotal . . . . .	2,343,000
Contingencies (15%) . . . . .	351,500
Subtotal . . . . .	2,694,500
Field Exploration* . . . . .	-0-
Land Acquisition . . . . .	-0-
Design Engineering (6%) . . . . .	161,700
Engineering During Construction (5%) . . . . .	134,700
Administration & Legal (4%) . . . . .	107,800
Startup (1.5%) . . . . .	40,400
Capital Cost . . . . .	3,139,100
Present Worth of Salvage Values (Building). . . . .	-79,500
Present Worth of Capital Cost . . . . .	3,059,600
<u>Annualized Capital Cost</u> . . . . .	297,300
Fixed Annual O&M Costs:	
Labor (5,000 m-h) . . . . .	49,500
Power (15,600 m-h) . . . . .	1,100
Variable Annual O&M Costs	
to Process TPD:	
Labor (9,970 m-h) . . . . .	98,700
Power (140,400 Kwh) . . . . .	9,600
Polymer (107,300 lb) . . . . .	214,600
Maintenance & Repair . . . . .	29,000
<u>Annualized O&amp;M Cost</u> . . . . .	402,500
<u>TOTAL ANNUALIZED COST</u> . . . . .	699,800
Annual Cost Per Ton Dry Solids . . . . .	\$65.15

\* Included w/drying facilities

Table 23

COST OF HORIZONTAL GREENHOUSE  
AND COVERED STOCKPILE

## Construction Costs:

## Greenhouse (5-60' X 400' bays):

Cast-in-place Concrete . . . . .	\$ 473,000
Asphalt Paving . . . . .	187,000
Electrical Fans & Louvers. . . . .	56,000
Structural Steel & Monorails . . . . .	858,000
Glazing . . . . .	986,000
Stockpile (180' X 260' metal bldg)	
Foundation . . . . .	109,000
Paving . . . . .	73,000
Shell . . . . .	316,000
Sitework . . . . .	95,000
Sludge Handling Machines . . . . .	120,000
Sludge Conveyor System . . . . .	263,000
Front End Loader . . . . .	35,000
Dump Truck . . . . .	50,000
Subtotal . . . . .	3,621,000
Contingencies (15%). . . . .	543,200
Subtotal . . . . .	4,164,000
Field Exploration. . . . .	30,000
Land Acquisition . . . . .	-0-
Design Engineering (6%). . . . .	249,800
Engineering During Construction (5%) . . . . .	208,200
Administration & Legal (4%). . . . .	166,600
Startup (1.5%) . . . . .	62,500
Capital Cost . . . . .	4,881,100
Present Worth of Salvage Values (Fndn, Structural, Glazing, Sitework). . . . .	-683,600
Present Worth of Vehicle Replacements (6 2/3 year service life). . . . .	85,800
Present Worth of Capital Costs . . . . .	4,283,300
Annualized Capital Cost. . . . .	416,200
Fixed Annual O&M Costs:	
Labor (5,000 m-h) . . . . .	49,500
Power (15,700 Kwh) . . . . .	1,100
Variable Annual O&M Costs to Process 30 TPD	
Labor (11,640 m-h) . . . . .	115,200
Power (268,400 Kwh). . . . .	18,400
Fuel (4,000 gal diesel). . . . .	7,900
Maintenance & Repair Materials . . . . .	25,200
Annual O&M Cost. . . . .	217,300

TOTAL ANNUALIZED COST . . . . . 633,500

Annual Cost Per Ton Dry Solids . . . . . \$58.99.



Table 24

COST OF ENCLOSED STOCKPILE STRUCTUREITEM

Construction Cost:	
Civil and Structural . . . . .	\$ 277,000
Superstructure 180'X 260' metal building . . . . .	316,000
Front End Loader . . . . .	35,000
Dump Truck . . . . .	50,000
Subtotal . . . . .	678,000
Contingencies (15%). . . . .	101,700
Subtotal . . . . .	779,700
Field Exploration. . . . .	10,000
Land Acquisition . . . . .	-0-
Design Engineering (6%). . . . .	46,800
Engineering During Construction (5%) . . . . .	38,900
Administration & Legal (4%). . . . .	31,200
Startup (1.5%) . . . . .	11,700
Capital Cost . . . . .	918,300
Present Worth of Vehicle Replacements (6 2/3 year service life). . . . .	85,800
Present Worth of Salvage Values (Building and Sitework) . . . . .	-71,500
Present Worth of Capital Costs . . . . .	932,600
<u>Annualized Capital Cost</u> . . . . .	90,600
Fixed Annual O&M Cost	
Labor . . . . .	-0-*
Power (7,300Kwh) . . . . .	500
Variable Annual O&M Costs to Process 30 TPD	
Labor . . . . .	-0-*
Fuel (4,000 gal diesel). . . . .	7,900
Maintenance & Repair Materials . . . . .	4,000
<u>Annual O&amp;M Cost</u> . . . . .	12,400
<u>TOTAL ANNUALIZED COST</u> . . . . .	103,000
Annual Cost Per Ton Dry Solids . . . . .	\$9.59

\* Stockpile labor costs included in respective dewatering and drying system costs.

# **APPENDIX D**

# **TOXICITY TEST REPORTS**



# City of Albuquerque

P.O. Box 1293 - ALBUQUERQUE, N.M. 87103

September 9, 1980

## LABORATORY REPORT

Waste Generator: City of Albuquerque, P.O. Box 1293, Albuquerque, N.M. 87103

Location of Waste Generation: Treatment Plants #1 and #2

Process Producing Waste: Liquid Waste Treatment Facilities

Description of Waste: Waste sludge from drying beds

Approximate Quantity of Waste Produced:

Average Monthly -  $5.07 \times 10^5$  kilograms

Maximum Monthly - Data not available

Annual -  $6.2 \times 10^6$  kilograms

Parameter(s) being tested: EP (Extraction Procedure) Toxicity Test as per "Hazardous Waste Management System", Federal Register, 45 (98), May 19, 1980.

Samples were collected on 6/25/1980 by David Kersey, Chemist.

The extraction portion of the test was performed by the City of Albuquerque and shipped to Wilson Laboratories on 17 July 1980 for chemical analyses.

Analysis portion of EP Toxicity Test was completed on 25 July 1980, according to "Hazardous Waste Management System", Federal Register, 45 (98); 33127-33128, May 19, 1980.

This waste does not exhibit the characteristics of EP Toxicity as defined in and tested according to "Hazardous Waste Management System", Federal Register, 45 (98), May 19, 1980.

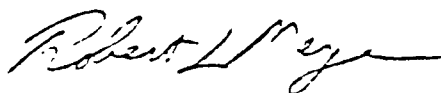
Metals Analyses were performed according to "Methods for Analysis of Water and Wastes", EPA-600/4-79-020, on a Perkin-Elmer 503 Atomic Absorption Spectrophotometer equipped with a flame and graphite furnace. Analysis were performed by Bruce East and Robert Rickard, list of qualifications attached.

Organic compounds were analyzed, according to "Methods for Benzidine, Chlorinated Organic Compounds, Pentachlorophenol and Pesticides in Water and Wastewater", U.S.E.P.A., September 1978, on a Hewlett-Packard 5710 gas chromatograph equipped with a Ni63 electron capture detection on a 1.5% SP-2250/1.95% SP-2401 Supelcoport 100/120 column at 185°C with a carrier gas flow of 60 ml/min. Analysis were performed by Clifford Baker and Robert Rickard, list of qualifications attached.

Analysis	EPA Hazardous Waste Number	Toxicity Limit (mg/l)	Analyses Results			
			8007-178 80-0290	8007-179 80-0291	8007-180 80-0283	8007-181 80-0284
Arsenic	D004	5.0	ND(0.05)	ND(0.05)	0.012	0.006
Barium	D005	100	0.10	0.075	0.14	0.24
Cadmium	D006	1.0	ND(0.0005)	0.0046	0.0080	0.0022
Chromium	D007	5.0	0.0006	0.0031	0.0027	0.013
Lead	D008	5.0	0.0038	0.0085	0.0038	0.0042
Mercury	D009	0.20	ND(0.0001)	ND(0.0001)	0.00025	0.0035
Selenium	D010	1.0	ND(0.001)	ND(0.001)	ND(0.003)	ND(0.003)
Silver	D011	5.0	ND(0.0005)	0.0008	0.0014	0.0023
Endrin	D012	0.02	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
Lindane	D013	0.4	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
Methoxychlor	D014	10.0	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
Toxaphene	D015	0.5	ND(0.01)	ND(0.01)	ND(0.01)	ND(0.01)
2,4-D	D016	10.0	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
2,4,5-TP	D017	1.0	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)
Polychlorinated Biphenyls			ND(0.01)	ND(0.01)	ND(0.01)	ND(0.01)

ND denotes none detected. The detection limit of the method is shown in parentheses.

WILSON LABORATORIES



Robert L. Meyer  
Chief Chemist

jh

File No. 80-9501  
Lab No. 8007-178 through 181  
Date: 29 August 1980

# **APPENDIX E**

## **ALTERNATIVE SITE**

### **ANALYSIS**

## SLUDGE PROCESSING FACILITIES SITE LOCATION STUDIES

This report is submitted pursuant to the request of WAPORA, Inc. for a summary of the investigations conducted by the City and its consulting engineers in search of the most reasonable site for sludge processing facilities for the period to the year 2000 and beyond. The purpose of this report is to summarize the previous assessment of the characteristics of each site which led to formulation of the City's proposal. Various aspects of wastewater facilities site analysis and selection efforts persisted throughout the 1975-1981 period. However, information utilized in this effort was gathered from a wide variety of sources representing urban planning and other work done over the past 20 years.

### METHODOLOGY

The fundamental methodology adopted to identify and successively screen locations was to (a) select from map study all general tracts possibly suitable from a topographic and land use point of view; (b) conduct field reconnaissance; (c) examine access, transportation linkage and utility services existing or feasible; (d) through consultation with City Real Property Office staff, prepare a judgment of land availability and cost; (e) in a preliminary way, consider the annualized cost of sludge transfer to the site, and (f) contemplate the environmental aspects of sludge transfer and on-site processing. This approach was grounded on a review of all relevant published and other information

which could be obtained, and avoiding unnecessary repeating of data or analyses presented in the EIS completed for the 1978 Facilities Plan. During the SEIS public participation process, suggestions for sites over and above those identified in this planning process were actively sought. WAPORA and their associated consultants were also urged to suggest sites for any system facilities that might appear promising during the course of their work on the project.

The investigative team began the site selection process by reviewing the areawide Comprehensive Plan prepared by the Albuquerque/Bernalillo County Planning Department in 1975. This report assisted in identifying feasible tracts of land in which, on the surface, the designated land use did not seem to conflict with the installation of components of the sludge management system.

Following examination of the Planning Department mapping, the City and its consulting engineers conducted field reconnaissances of the areas tentatively identified. Simultaneously, the investigative team thoroughly reviewed the literature in search of relevant information which may be beneficial for site analysis and selection.

#### FACILITIES PLAN AND EIS

The results of these and other efforts undertaken in the early phases of the site selection process are embodied in the Albuquerque Areawide

Wastewater Collection and Treatment Facilities Plan of 1978 (herein referred to as the Facilities Plan). Volume 2 (Figure 7) of the Facilities Plan identifies a number of parcels of land distant from and including Plant No. 2 in connection with alternative siting of new treatment plants, the development of plant effluent infiltration-percolation schemes, and proposed irrigation projects using plant effluent. In particular, the EIS addressed tracts on the Southeast Mesa (basically the tract of state-owned land located south of Montesa Park), the South Valley including both treatment plants, and several parcels in the Pajarito area on the Southwest Mesa. In addition to these primary sites, several locations considered for potential "satellite" plants, serving relatively isolated segments of the planned collection system, were identified in the facilities planning process. These include: the Corrales Plant Site (located northwest of the City, near the intersections of Coors and Corrales Roads); the Sandia Heights Plant site (in the Sandia foothills, at the northeast extremity of the urban area); and the East Mountain Plant site, in the upper reaches of Tijeras Canyon adjacent to I-40.

#### The Phase II Expansion Report (Balloon Report)

Subsequent efforts expanded the array of identified sites. The 1980 Phase II Expansion Program Engineering Report (herein referred to as The Balloon Report) details siting considerations with regards to land application. (See pp. 7-111--7-114.) The Balloon Report expands on the sites documented in the Facilities Plan, presenting other alternatives which merited investigation. Los Lunas East and West (located south of



of Isleta Reservation in Valencia County), the West Mesa Airport site (found on the western-most edge of the City) and Montesa Park (situated near Tijeras Arroyo, south of the City) were included for review. On-site field reconnaissance, laboratory soil sample analyses and special reports were executed and prepared to provide further data for ultimate site selection.

#### SITE EVALUATIONS

Whereas the entire siting process extended over a lengthy period of time and included a review of numerous sites, the following list depicts the principal sites investigated:

- Kirtland Air Force Base
- Satellite Plant Areas
- Southeast Mesa
- Plant No. 1
- Plant No. 2
- Plant No. 2 Infiltration-Percolation Site
- Pajarito
- Isleta Reservation
- Los Lunas East
- Los Lunas West
- Volcano Park
- West Mesa Airport
- Rio Puerco
- Montesa Park

These sites are indicated on the map provided as Appendix A.

As is apparent, the alternative site investigation was geographically comprehensive in scope. Although these sites were initially considered for a variety of wastewater system needs, the City and its consulting engineers utilized the information, regardless of intent, in the evaluation of site suitability for sludge handling facilities.

All sites listed above were evaluated for relative strengths and weaknesses.

The standards employed in this regard included:

- (1) Technical suitability related to needs associated with the construction of facilities and/or systems;
- (2) Economic issues such as land values, real estate interests and the proximity of sludge users;
- (3) Physical realities of each site including distances from population centers and treatment facilities, accessibility, terrain and hydrological factors; and
- (4) Environmental and Cultural concerns regarding the preservation of the Albuquerque area's heritage.

Each site was analyzed from these perspectives. Particular attention was given to site accessibility. Another important variable identified was the availability of (or feasibility of readily developing) utility services at each site. Environmental and other characteristics being equal, a site lacking sewers and sources of water and power was judged to be less satisfactory for development for a sludge processing system than one better served by utilities.

The remainder of this report is devoted to reviewing site-by-site the factors taken into account as the City reached its final selection of the most suitable site for processing.

### Kirtland Air Force Base (KAFB) (1)

This site, located generally south of the City, was one of the first considered. The base is host to a large number of DOD and DOE functions, including extensive facilities of Sandia National Laboratories. The primary advantage associated with this site includes its accessibility to transportation routes and utilities. Roads provide access to nearly all areas and a rail spur provides rail transportation to the base. Adequate utilities are available, some being extensions of City services, and others owned and maintained by the Base.

Disadvantages of the site are those relating to distance and pump lift requirements. As KAFB is approximately eight to ten miles east of Plant No. 2 and is elevated about 500 feet above the plant beyond the Southeast Mesa, considerable pumping would be necessary. In addition, KAFB officials have indicated that land within the jurisdiction of KAFB definitely is not available as an alternative site. According to the officials, this is primarily due to the Base's stringent security precautions and land assets commitments related to national defense research. KAFB received only two votes (out of 14) in the CAC preference poll as site for sludge facilities. Therefore, the investigative team determined that KAFB is an unrealistic site to propose for sludge processing facilities.

### Satellite Plant Areas (2)

The parcels considered in the Facilities Plan for isolated-area treatment plants were considered, but relatively quickly dismissed as impractical

for centralized sludge handling facilities. These three sites are all 15-18 miles from Plant No. 2, and far higher in elevation, imposing prohibitive sludge transport costs, even though basic road access is adequate. In terms of utility provision, power sources are available, but because these sites are as yet external to the municipal utility service area, sanitary sewers and city water supplies are not available. The Corrales, Sandia Heights and East Mountain sites share all these problems, which led to their elimination from further consideration.

#### Southeast Mesa (3)

The large tract of land just south and west of Kirtland Air Force Base is owned (and managed in trust for UNM) by the State Land Office. The UNM tract is elevated 370 feet above Plant No. 2 and is located approximately five miles southeast of the facility. The water table in the area is relatively deep (350 ft.); however, a ground water nitrate problem has been detected, the cause of which is still under technical debate. This site also demonstrates a relatively high soil pH factor (8.4-8.6) and a CEC of 6.5-10.1 meq/100g. A heterogenous soil type exists on the Southeast Mesa including fine sandy loam soil types typically found on the valley terraces such as Madurez-Wink and Bluepoint-Kokan associations. The area is not bisected by roads of any consequence and the nearest rail line is located about five miles to the west. The Southeast Mesa area does not have ready access to utilities. As previously noted, the lack of utilities has serious ramifications when evaluating site suitability, as capital costs rise significantly.

If the tract were for lease (and some discussions suggest that it is not), the cost is estimated at \$180/acre/year. The crucial point is the land is not for sale and further leasing by the City for even the existing temporary sludge lagoons may not be possible. This reluctance on the part of the University was clearly reflected in conversations held between the City and UNM officials. From those interchanges, it appears that UNM may wish to utilize the land for planned commercial and residential community development. Since this is the case, it is highly unlikely that UNM would be interested in getting involved in long-term sludge management systems. As a result of this reluctance and the lack of site access and utilities, the Southeast Mesa was omitted from further deliberations.

#### Plant No. 1 (4)

Within the South Valley, several sites were studied at the beginning of the site selection process, all of which are depicted in Figure 7, Volume II of the Facilities Plan. The area enveloping Plant No. 1 is one of the South Valley sites investigated as a potential location for sludge processing facilities.

Generally, the plant is situated in a commercially zoned area just west of Second Street S.W. and north of Rio Bravo Blvd. S.W. Whereas the Plant No. 1 vicinity has the advantages of accessible road and rail services and complete utilities, the area was deemed to be unsuitable due

to the lack of available land adequate for the buffer zone which would be mandatory in this odor-sensitized neighborhood. The subsequent enactment of a court stipulation calls for the closing of Plant No. 1 largely rooted in many years of real or perceived odor nuisances. Therefore, the stipulation reinforces the previously reached consensus regarding unsuitability of sites in this general area, for the proposed purposes. Even though odor control in the sludge facilities will be an integral part of system design and operation, it was judged impossible to achieve public acceptance for such a concept at this location, in spite of such assurances.

#### Plant No. 2 (5)

Also situated in the South Valley, Plant No. 2 was evaluated as a potential site for sludge handling facilities. In particular, the investigative team studied the 60 acre parcel of land located directly north of the plant complex which the city recently acquired. Advantages of on-site centralization potentially include lowered treatment costs and ease of operation. Upon further investigation, however, several disadvantages emerged which reduced the area's potential for success. One, this part of the South Valley has a very shallow water table, commonly lying within 5-15 feet of the surface. Due to the shallowness of the alluvial aquifer, ground water contamination is a potential hazard which must be recognized. In particular, nitrates, which may be derived from the Tijeras Canyon

area, are present in small but significant amounts in several areas in the region. Consequently, concern has been expressed in regards to constructing facilities which have any potential to heighten an already prevalent pollution problem.

Secondly, the City's policy commitment to odor containment would be seriously undermined by an on-site sludge processing facility. Further, constructing sludge handling facilities at the plant site is not a meaningful response to the court stipulation which mandates best practical technology to help reduce nuisances at or near the plant. Noting that nine of the 14 CAC votes favored sites elsewhere, it is felt that construction of extensive sludge processing facilities at Plant No. 2 would be socially and politically unacceptable to the South Valley residents. Without community support, further legal entanglements and subsequent construction delays would quickly make an on-site location less cost-effective. Limited processing, such as mechanical dewatering in enclosed facilities, is probably viable, however.

Based on the uncertainties of land availability and pollution potential, coupled with court stipulations, policy commitments and perceived community response, the vicinity of Plant No. 2 was judged as an unrealistic site for sludge handling facilities more extensive than dewatering for subsequent landfilling.

#### Plant No. 2 Infiltration-Percolation Site (6)

The infiltration-percolation site proposed in the Facilities Plan is located south of the Mountain View Community, bounded on the east and west by Broadway Blvd. S.W. and Second Street S.W. respectively. Situated on the escarpment extending up to the Southeast Mesa, it is of higher elevation and steeper terrain than the alluvial valley floor. Most of the area under consideration encompasses valley terraces of Bluepoint-Kokan and Madurez-Wink soils (fine sandy loams). As might be expected, wind and water erosion present problems for this area. Due to these characteristics, this site is not as attractive as the others located in the valley. Further, much of the area is in productive agricultural and other uses.

Much of the earlier discussion pertaining to the treatment plants is applicable to this site as well. Problems exist with regards to ground water contamination, negative community response and, to a degree, the uncertain availability of land. Consequently, the area was dropped from consideration early on in the site selection process.

#### Pajarito (7)

Situated on the Southwest Mesa, Pajarito lies just north of the Isleta Reservation. Within Pajarito, three specific localities at varying heights were examined. Differences in elevation serve as the primary



distinction among the three sites: one area is low on the mesa, another is back to the west and is much higher, and the third is an intermediate site.

The general Pajarito area is privately owned. Land values range widely, estimated at a minimum of \$1,250/acre to \$8,000/acre or more. This dramatic variation in land prices may be attributed to differences in road access among the three targeted areas. In terms of transportation, secondary roads provide access to only a small portion of the site. A similar access problem is noted in conjunction with municipal utilities, for none are presently available beyond the margins of this area.

Collectively, the Pajarito sites are approximately 360 feet above Plant No. 2, have a slight (1-7%) surface slope and would require a pipeline on the order of 53,000 feet in length. Although Pajarito is the site closest to Plant No. 2 of all the West Mesa locations considered, it still is fairly remote (10<sup>+</sup> miles) from the plant. These site characteristics, including elevation, topography and distance, would warrant three pumping stations and a moderate static lift if a location in the area were developed for sludge handling purposes. This site also exhibits a heterogeneous soil association in that Madurez-Wink and Pajarito loamy fine sand constitute its soil profile. Concentrations of nitrates have been detected in selected wells in the Pajarito area ground water. With regards to site deterioration, a significant erosion potential exists in that moderate water and severe wind erosion has been noted. This

is typical of the West Mesa where high winds disturb the unprotected and sandy surface soils.

Despite these negative features, the investigative team realized several benefits to be gained in siting sludge processing facilities at Pajarito. The relative remoteness of the site from existing community development is attractive. Plus, the deepest contour in the Middle Rio Grande Ground Water Basin runs west of and roughly parallel to the river, likely a buried old meander. This results in a southwesterly flow of ground water to a point somewhat westerly of the present river channel. By siting a facility at Pajarito, therefore, any leachate from the installation might tend to move away from the City wells located in the more densely settled valley area to the east.

Problems of site accessibility, utility services pumping requirements and erosion potential are recognized, but this site was judged perhaps workable for a DLD system, and therefore it was retained in the alternative studies for that purpose.

#### Isleta Indian Reservation (8)

One of the largest of the 19 Indian Pueblos located in New Mexico both in area and population, Isleta is located south of the treatment plant, at the southerly boundary of Bernalillo County. Isleta land is downstream from Plant No. 2, and includes portions of the valley at an elevation approximating that of the Plant. Because of its relatively low elevation

and reasonable proximity to Plant No. 2, modest pumping requirements were recognized as a potential advantage of this site. In addition, this general area has adequate access by road and rail. Not only is the area serviced by Interstate 25 and the ATSF railroad line, but also several secondary and other roads bisect the reservation.

Upon further examination, however, it became apparent that obstacles exist to siting sludge treatment facilities within the Reservation boundaries. Whereas the City has the legal authority to obtain real estate inside or outside the City limits, it can not purchase Federal property, Indian holdings, nor state lands. This is a critical factor, for the City would prefer to make capital improvements of the sort envisioned on land they own. This reluctance on the part of the City is partially due to the great practical difficulty of easement acquisition and subsequent pipeline construction on Indian land. Thinking that perhaps the Interstate 25 easement could also be jointly utilized for pipeline passage, the City contacted the Highway Department, where it was learned that separate easements must be obtained for such new works, irrespective of whether physically sited within existing easements. The acquisition of easements is very difficult to predict, both in regards to cost and time required, and there is no assurance whatever of eventual success. As was noted for South Valley sites, another negative factor related to this site includes the absence of municipal services on the Reservation. Since services are not extended to the Reservation, resistance to locating sludge processing facilities at this site may reasonably be

anticipated.

Based on this knowledge, Isleta Reservation was deemed unrealistic as a suitable site. Despite the advantages of location and accessibility, factors contributing to the site's rejection include the lack of municipal services and City ownership, impracticality of easement acquisition and the perceived negative community response to the proposed project.

#### Los Lunas East (9)

The Los Lunas East site lies immediately south of Isleta Reservation in Valencia County, approximately two miles west of Interstate 25. Even though this site is somewhat removed from the Albuquerque population center, it was initially identified due to its setting in relation to Plant No. 2. With a slight surface slope, an elevation equal to that of the plant and a pipeline distance of 77,000 feet, the site would require (relative to some others) modest pumping investment: two pumping stations and a relatively small ( $100 \pm$  feet) lift would be sufficient. Furthermore, the Los Lunas East is situated downstream and to the west of the Rio Grande River, yet east of the mesa escarpment. As was the case with Pajarito, the Los Lunas location could potentially minimize the adverse impact of contamination of valley wells from the facilities due to the southwesterly trend in flow of the ground water, which is relatively deep ( $150 \pm$  ft) in this area.

On balance, however, the identified disadvantages outweigh any perceived advantages in locating facilities at this site. Although access by road is adequate overall, it is uncertain whether sludge could be pumped via a pipeline across Isleta Reservation which lies between Los Lunas and Plant No. 2. As was the case in Isleta Pueblo, questions arise regarding locating facilities in an area which is not serviced by the project and does not maintain adequate utilities for facility support. Another factor which must be considered is that Los Lunas East would involve another political entity (Valencia County) in an already complex situation. For these reasons, Los Lunas East was judged to be inappropriate for facility siting.

#### Los Lunas West (10)

Another privately owned area, Los Lunas West, was also examined for site suitability. Approximately five miles west of Interstate 25, this site is located on the mesa overlooking Los Lunas East. Because it is situated on the mesa, Los Lunas West differs from the eastern site in elevation and pipeline distance. In this regard, Los Lunas West has an elevation difference of approximately 400 feet and would require a 104,000-foot pipeline from Plant No. 2. Hence, greater pumping requirements are associated with the westerly site. However, the Los Lunas West site can likely be purchased at a lower cost (\$850/acre) than its eastern counterpart.

Similarities are also evident between Los Lunas East and West. Both sites demonstrate comparable pH values and soil associations, with a slightly higher concentration of fine sand on the mesa. Topography is similar at each site.

In terms of sludge processing requirements, perhaps the primary advantage of Los Lunas West is its accessibility via a secondary road and the Santa Fe railroad line. The advantages, however, are modest in comparison with the disadvantages associated with this site. All the drawbacks noted for Los Lunas East also apply to this site, and the very extensive pumping requirements discourage facility siting in Los Lunas West.

To summarize, from investigations conducted in areas external to Bernalillo County, the City determined that these areas are not reasonable for sludge processing facilities. Various dialogues with EPA and the CAC led to a general consensus in support of this view.

#### Volcano Park (11)

The Northwest Mesa, on the western horizon of the City, was also examined for potential sites. Since Volcano Park was in City ownership at the start of the project, it was one site on the mesa selected for investigation. This sparsely settled area incorporates the Indian Petroglyph Park and a portion of the area of volcanoes. Volcano Park is about twelve miles northwest of Plant No. 2 and is at a substantially higher elevation than the plant; pumping costs could become prohibitive.

Although this area has a relatively deep water table (it marginally encompasses the deeper portions of the Santa Fe Group aquifer ) the soil structure of Volcano Park is very permeable. Possible ground water contamination therefore must be recognized when considering the construction of sludge processing facilities at this site. Other factors deserving recognition include site access and utility provisions. Several secondary and dirt roads presently traverse Volcano Park. Sanitary sewer lines and other services are not readily available.

A final consideration of Volcano Park is its historical significance, a part of which is now preserved in the Indian Petroglyph Park. In light of past discoveries, it is felt that this site is archeologically sensitive. Hence, construction activities and an increase in carbon monoxide levels resulting from plant traffic may prove to be deleterious to the cultural heritage of the area.

Therefore, due to great distances from Plant No. 2, extreme lift requirements, the evidence of soil porosity, transportation difficulties and cultural ramifications, Volcano Park was viewed as an inappropriate site for sludge processing facilities.

#### West Mesa Airport (12)

In addition to Volcano Park, the second site examined on the Northwest Mesa was the tract of approximately 6400 acres located immediately west of the volcanoes. Many of the benefits and liabilities associated with Volcano Park are also evident in the West Mesa Airport site.

In regards to this site, soil types, water availability and distance factors were examined and are noted in Table 7-40 of the Balloon Report. Specifically, it has been estimated that this area is 830 feet above Plant No. 2 and would require a 94,000 foot pipeline. Based on these site characteristics, extensive pumping capabilities would clearly be necessary including six or more pumping stations and considerable pumping lifts. In addition, despite the site's deep water table, the fine sand typical of Madurez soils indicates a porous soil with potential for ground water contamination. Another problem is the severe wind erosion and moderate water erosion potentials demonstrated at this site.

The City has placed options to purchase this site for a new feeder airport. Consequently, consideration was given to the possibility of integrating airport and sludge treatment facilities so that transportation and municipal service infrastructures could be jointly developed as a part of the airport project. Greater accessibility and utility convenience, therefore, made the westerly mesa site appear to be more advantageous than Volcano Park. However, the other characteristics associated with the airport site, including great distances from the plant and extensive pumping requirements, outweigh any perceived gain from facility integration. Further, timing of airport development is as yet uncertain. Therefore, it was concluded the area does not appear to offer a reasonable site for sludge handling facilities.



### Rio Puerco (13)

A tract located along I-40 on the upper slopes of the Rio Puerco drainage basin was also examined. Due to its great distance from and height above the plant, it was judged unsuitable for development for other than a DLD scheme. This location was retained in the planning studies for that purpose.

### Montesa Park (14)

By far the most favorable location identified for off-site sludge processing is Montesa Park, a City-owned parcel of 570 acres near the Tijeras Arroyo, located about five miles directly east of Plant No. 2.

This is not to say that Montesa Park is without problems. We feel that the information presented in the Facilities Plan, the Balloon Report and materials provided to the CAC illustrate the drawbacks associated with Montesa Park. The potential disadvantages of Montesa Park noted include potential soil foundation difficulties, nitrate contamination, BASH concerns and interference of recreational activities.

Because of structural problems observed at the former detention center which occupied this site, it was recognized that a soil problem may

exist at Montesa Park. Consequently, a report was commissioned to analyze the performance of foundation soils along the Tijeras Arroyo in the vicinity of Montesa Park. From this analysis it was determined that the City's proposed project can be built without encountering the structural problems that were experienced with the detention center, through proper attention to design. In addition to foundation conditions, the soils of Montesa Park are susceptible to moderate to severe wind and water erosion. This is not surprising when one considers that all the mesa sites (east and west) demonstrate a relatively high degree of erosion potential.

Another recognized problem of Montesa Park includes nitrate contamination of the ground water. As has been noted, this problem is prevalent throughout the Tijeras Canyon/Mountainview region and is of an undetermined origin. In Montesa Park, however, this problem is less of a concern when one considers the relatively great depth (180<sup>+</sup> feet) of the water table and the calcareous and cementitious nature of Montesa Park soils. Therefore, the site is relatively better protected against accidental contamination than are some other locations where the water table is shallower.

With regards to bird aircraft strike hazards (BASH), in spite of the fact that dried sludge stockpiles have existed at Montesa Park for numerous years with no evidence of bird infestation, the proposed design for Montesa Park will take into account these concerns in order to

prevent potential problems. For example, all open stockpiling as well as open air drying of sludge have been eliminated from the proposed project design. Beyond these measures, we do not feel that BASH concerns are relevant to this situation. In fact, little hard evidence was presented by the USAF BASH team with regards to bird hazards from this type of facility.

A special consideration of Montesa Park is that there is a City Parks motorcycle course immediately to the west of the site, and the hills to the south of Tijeras Arroyo are sometimes used for hang gliding. The planning of proposed facilities recognized this recreational use and the design of facilities will be such as to preserve such use. These recreational activities should not be impaired by the operation of a sludge processing system, particularly as all processing operations are enclosed.

From an engineering point of view, several appealing aspects of this site were readily apparent. Since Montesa Park is City-owned land, there is a strong economic advantage, particularly since EPA and the State are not participating in land acquisition costs for projects of this type. Also, there are relatively few land owners involved in the abutting tracts and most of these tracts are publicly owned.

In terms of on-site sludge users, the Forest Service has a long-term lease from the City for 220 acres of Montesa Park to be used as a tree nursery. Only 50 to 70 acres of the 570-acre parcel are sufficiently

flat for construction and are above the 100-year flood plain. Therefore, the site naturally allows for a liberal buffer area, and the tract is large enough to serve this purpose to the end of the century and beyond. Even the most far stretched planning for development (by UNM) indicates that the area, including about one mile around the facilities, would remain undeveloped through any conceivable future time.

Pipeline and pumping requirements are also favorable when compared with any other off-site location. Since Montesa Park is less than five miles from Plant No. 2, only one pump station external to the plant would be required. In addition, no pipeline easements of any consequence would be required to move sludge into the site or remove the sidestream back to the plant due to the Tijeras Interceptor and its easement.

Site accessibility and utility convenience are other favorable site factors. There is excellent road access to the area and an easy connection could be arranged with the nearby KAFB railroad spur, if ever desired for bulk sludge shipment. Also, a reliable support system exists including on-site electric power, gas, water and telephone utilities.

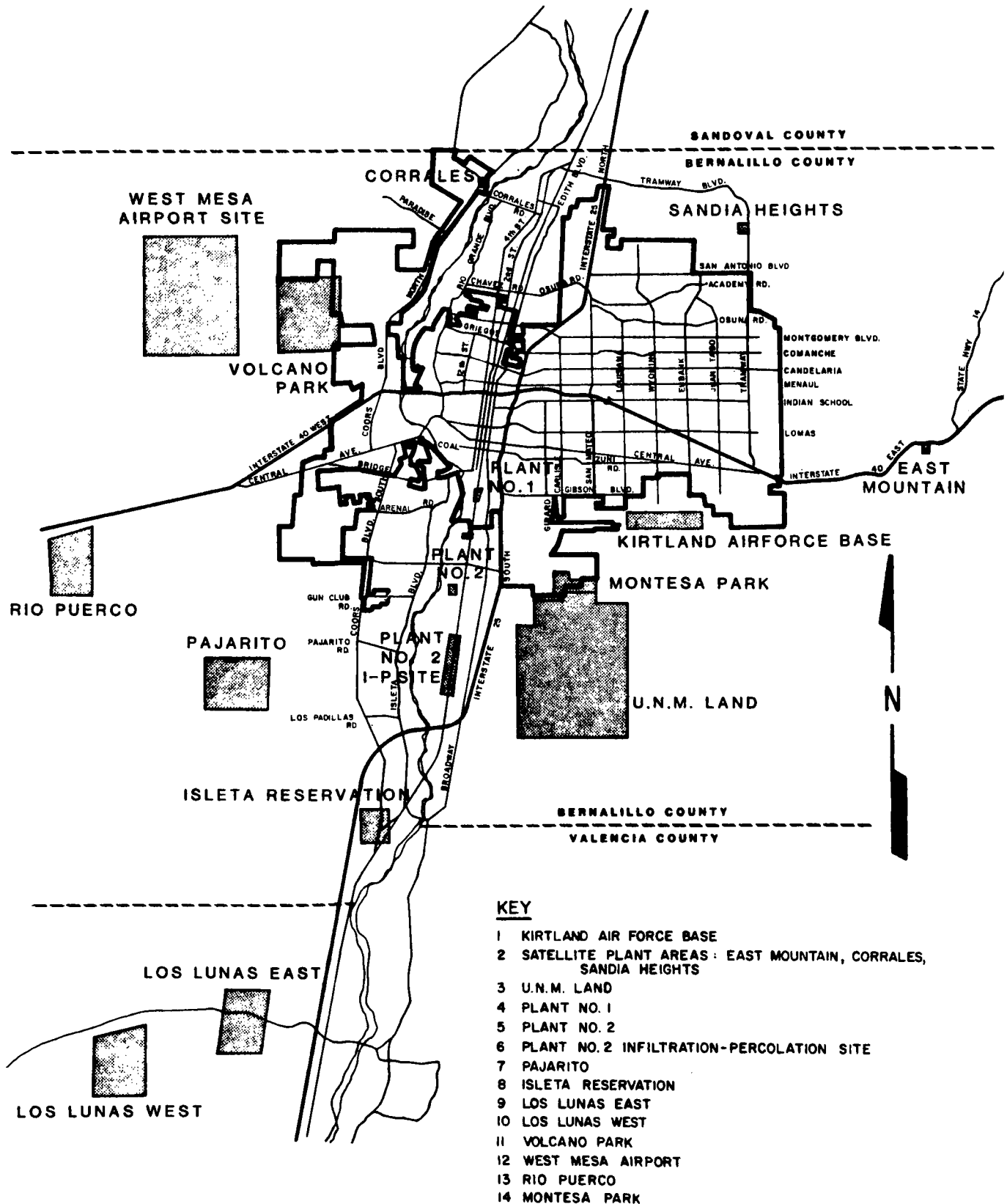
### CONCLUSIONS

Based on the investigations and discussion briefly summarized herein, Montesa Park appears overall the best of a wide variety of locations considered, for the following principal advantages relative to the alternatives:

- Lower costs for site acquisition and development.
- Ability to capitalize on existing facilities for access, and in-place utility services.
- Environmentally suitable, with proper planning and design.
- Relative proximity to Plant No. 2.
- Liberal buffer areas around the facility.
- Free from the potential of population centers within one mile for conceivable planning horizon.

Based on the results of our investigation, we feel that our proposed site, Montesa Park, reflects a sensitive handling of the technical, economic, geological and environmental considerations relevant to the site selection

# ALTERNATIVE SLUDGE PROCESSING FACILITIES SITES



# **APPENDIX F**

## **PRELIMINARY SLUDGE SURVEY**



# City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

MAYOR  
Harry E. Kinney

CHIEF  
ADMINISTRATIVE OFFICER  
Frank A. Kleinhenz

RECEIVED

March 12, 1982

MAR 22 1982

6 ES

Mr. Steven R. Rubin  
Project Engineer  
Construction Grants Branch  
Environmental Protection Agency  
Region VI  
First International Bldg.  
1201 Elm St.  
Dallas, TX 75270

Subject: Albuquerque Sludge Management System - SEIS

Dear Mr. Rubin:

This is in response to Mr. Romanow's letter of February 3, 1982 relative to the impact of our potentially being denied the continued use of sludge as a soil conditioner on City Parks. I understand that the Water Resources Department staff have had numerous discussions with you regarding this matter since the February 3rd letter. Therefore, please consider this as a final "rap up" of matters relative to sludge value.

We feel that the City takes justifiable pride in our excellent parks and golf courses, and the City is certainly committed to continuing our historic level of maintenance to preserve these assets for the community. Should we be denied the opportunity to continue using sludge in the manner that we have used it so beneficially for so many years, we would of course take prudent management and budgeting steps to provide the most appropriate and scientifically sound fertilizer and soil conditioner regimen for the parks, among the options which remain. However, we do note that our present consultants join our staff who have many years experience in local park maintenance, in affirming that in fact there is no chemically-based substitute material known as effective as sludge on these calcareous soils.

We would like to emphasize the fact that it is difficult to equate cost of substitute chemical fertilizers if in fact no true substitute exists. For example, at the prevailing price of fertilizer (N-P-K) material, we would anticipate spending an equivalent of \$33/ton of sludge for our parks and golf courses, if sludge were not available. This figure is based on the amount of fertilizer required to equal the nitrogen available in sludge. However, it does not consider the value of all the constituents in the sludge, particularly the essential micro-nutrients such as iron - chelate and zinc. It is conceivable that some of the micro-nutrients available in sludge may have to be applied to the City parks to preserve their existing character and appearance. In absence of more scientific



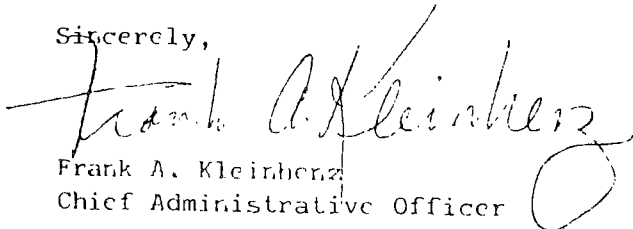
studies to identify the types and rates of these substitute products needed, we could not provide a reasonable estimate of costs for replacement chemicals if sludge were not available. Certain inherent values in the use of sludge on City parks are related to its soil-conditioning and water holding capability. We are not aware of a practical method to assign dollar value to sludge for these characteristics.

Our Parks personnel have experienced a reduced watering requirement with sludge use, though the exact amount of savings cannot be determined from current records. In any event, considering the fact that our parks and golf courses utilize almost one million dollars worth of City water you can see that a modest 10% reduction in watering could translate into great savings.

As you know, we plan to market about 40% of total design sludge production at fair market value in an effort to partially offset the cost of sludge disposal. In order to assess a fair market value for processed sludge, we conducted a very preliminary telephone market survey. Results of this survey are summarized in the attached Exhibit 'A'. You will note that the demand for similar organic fertilizers/soil conditioners just within the City of Albuquerque far exceeds the marketable quantity of sludge that we would produce. If you consider demand for such materials within Bernalillo County and other outlying areas, the sludge quantity to be marketed is trivial. Then, when one considers other products such as milorganite being successfully marketed at prices far in excess of \$200/ton and other far less effective products being marketed at \$50-70/ton (wet tons), we believe that there is a potentially strong market for processed Albuquerque sludge at prices at or above \$70/dry ton on a wholesale basis and well above \$100/dry ton on a retail basis. We have an excellent Customer Services Division servicing residential accounts that is fully capable of handling a retail market. However, whether the City enters such a retail market is a policy matter that must be evaluated at a later date. We can certainly market the product on a wholesale basis to a private enterprise, should we decide not to enter the retail market in the future.

I hope this letter will clear up the issues and questions raised by EPA and WAPORA, Inc., regarding sludge value. Please feel free to contact the Water Resources Department if further information is needed.

Sincerely,

  
Frank A. Kleinberg  
Chief Administrative Officer

FAK:ln

cc: Paul Noland  
Ed Stokes - NMEID  
A.K. Khera  
John Burgh - CDM

Scott Ahlstrom - CH<sub>2</sub>M HILL  
Al Boberg - Parks Dept.  
Darlene Owsley - EPA

## PRELIMINARY MARKET SURVEY OF SLUDGE VALUE

The purpose of this report is to summarize the preliminary telephone survey conducted February 26 through March 1, 1982 regarding the market value and receptivity of sludge as a soil fertilizer/conditioner. A wide variety of contacts were made in this respect ranging from commercial retail and wholesale distributors to individual users such as cemeteries and landscape contractors.

In regards to cemeteries, several caretakers were contacted to determine interest in and usage of organic soil supplements. One manager generally displayed little interest in an organic product primarily due to the cemetery's current success with liquid chemical fertilizers. A concern was also noted during this conversation regarding the use of an organic product which may emit odors, despite reassurances to the contrary. The other caretaker contacted, on the other hand, demonstrated a keen interest in the City's sludge product. Presently, a chemical fertilizer (Nipik) is collectively purchased for three affiliated cemeteries in Albuquerque and Santa Fe. Their combined expenditure in 1981 equaled 240 dollar/ton for approximately 15 tons of chemical fertilizer. Because they appeared to be minimal users, however, it was realized that cemeteries alone do not justify wide-scale marketing of City sludge.

In conjunction with the cemeteries, several attempts were made to contact private golf courses, knowing that organic soil supplements are heavily applied on the courses' greens. Although the surveyor was not able to contact the maintenance personnel of any private course, one may assume that their application rates roughly approximate that of the cemeteries. That being the case, both of these consumers would employ a mere fraction of the City's projected quantity of sludge. Therefore, other users were identified to supplement these potentially minimal markets. To this end, the surveyor telephoned a number of commercial outlets and landscaping contractors.

In reference to retail outlets, three major nurseries were contacted. Whereas two of the nurseries each sell ten tons of soil fertilizer/conditioner annually at more than 350 dollar/ton, the other does not carry an organic soil supplement. Rather, it packages and markets a brand name product consisting of ground-up bark which is an inferior product since it does not contain fertilizer and conditioning properties and is totally void of essential micro-nutrients that are present in sludge. The manager of this nursery indicated that approximately 2000 tons at 66 dollar/ton is dispensed annually, demonstrating that a viable retail market exists in Albuquerque if the price is right. In light of this fact, the City's suggested cost of 70 dollar/ton appears to reflect a modest market price on a wholesale basis. At this wholesale price, it is believed that a private enterprise is assured of an excellent margin of profit in retailing the product, should the City decide not to enter the retail market.

In addition to retail outlets, the surveyor contacted several wholesale fertilizer distributors. In the course of the telephone survey, one

manager was very receptive to purchasing a soil fertilizer/conditioner from the City. This interest was reciprocated by the City since he estimated that his firm could easily handle 1000 tons a year at the rate of 120 dollar/ton. It was concluded from this conversation that potential wholesale customers worthy of further consideration exist in Albuquerque.

Another large wholesale operator was contacted which does not carry a true soil fertilizer/conditioner. Instead, it merchandises a heat-treated steer manure which is less effective than sludge due to lack of micro-nutrients. Last year the company processed and bagged 200 tons of the name-brand product and sold it in 50 lb. sacks at the rate of 60 dollar/ton. As was the case with the other wholesale distributor, this manager expressed much interest in the City's product. In fact, several years ago he had initiated discussion with the Parks Department requesting samples of sludge, however, to date he has not received any. Based on this demonstrated interest as well as the expressed market potential beyond current levels, this appears to be another marketing outlet deserving follow-up.

The third distributor contacted is the primary provider in New Mexico of Milorganite, a product nationally distributed by the Milwaukee Metro Sewerage District. From conversations with the District and the Albuquerque distributor, it was learned that 100 tons of Milorganite was dispatched to Albuquerque last year and it was sold in 44 lb. bags at 225 dollar/ton. This relatively small quantity that reaches New Mexico has been attributed to the great overall national demand, particularly in the Midwest and Northeast, which serve as the focus of the District's marketing efforts. Also, it is less profitable for private enterprises to purchase materials at these relatively high rates and to pay for shipping charges.

Following the survey of distributors, local landscaping contractors were asked to estimate the quantity of soil fertilizer/conditioner they use in landscaping. Based on a 6,000 sq. ft. lot (the smallest lot size permitted in R<sub>1</sub> zoning), one landscaper estimated 450 lb. per lot landscaped. This figure was discredited, however, in that much heavier application rates were cited by two other contractors. In this regard, other landscaping contractors apply ten yards which due to the nature and consistency of sludge translates into approximately five tons per lot landscaped. Then, by contacting the City's Code Administration Division, a determination was made regarding the number of residential, single-dwelling building permits issued. In 1981, the record shows that almost 1500 permits had been granted. Since this number of permits applies only to the City proper and reflects an all time low of construction activity (particularly in comparison with previous years), it serves as a baseline of what the market will bear. Consequently, we can comfortably predict that 10,000 tons of sludge could be employed for domestic landscaping use.

Beyond domestic landscaping use, one can reasonably anticipate that light commercial and agricultural interests would also serve as viable end users of the City's product. Although time did not permit the contacting of such interests during this preliminary survey, it is

realistic to assume that an additional 10,000 tons may also be used in this regard. This estimate is primarily based on informal discussions held early on in the planning phase of this project with operators of sod farms and dairies located throughout the Albuquerque area.

Therefore, when one combines commercial and residential users the current demand for a product of this type may well exceed 20,000 tons. Based on a population of one-half million, including the City and its surrounding communities, this determined level of current demand appears to be highly realistic. As the City's product is only 25% of the total demand, we anticipate that the sale of sludge as a soil fertilizer/conditioner will be feasible as well as cost-effective. Also lending support to the City's marketing of sludge, is the final recommendations received from the Citizens' Advisory Committee (CAC), where a ten-vote majority favored sludge recycling. Clearly, the current market capacity as well as local citizen preference warrants the City's involvement in an enterprise of this type.

Some Typical Quantities of Materials Marketed  
in Albuquerque (Partial List)

<u>Contact</u>	<u># ton/year</u>	<u>\$/ton</u>	<u>Product</u>
Roland	10	388.	milorganite/ Roland Brand
Loeper	10	358.	milorganite
Greer. Acres	2250	66.	Ground-up Bark
Albuq. Chemical	1000*	120.	soil fertilizer/ conditioner
Desert Greer.	200	60.	Ground-up Steer manure
SW Toro	100	225.	milorganite

\*suggested market.

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