
**ASPC LEWIS COMPLEX
WASTEWATER TREATMENT FACILITY**

MARICOPA COUNTY DEPARTMENT OF ENVIRONMENTAL SERVICES

**REVISED FEASIBILITY REPORT FOR WASTEWATER
TREATMENT FACILITY
DRAFT**

MARCH 1998

CAROLLO PROJECT NUMBER 4374B20 006



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INTRODUCTION

The ASPC Lewis/Juvenile Complex is a new facility planned for an undeveloped site. The site is located along Highway 85, approximately ten miles south of the Town of Buckeye, as shown on the Vicinity Map in Attachment I. Vehicular access to the prison is provided from Highway 85 just north of Patterson Road.

The project will be built in one phase and is expected to be at full capacity within three years. The wastewater treatment plant for the prison facility will have the capability to treat up to 0.75 million gallons per day. Treated wastewater will be reused on-site with a zero net water balance.

According to the 208 Water Quality Management Plan prepared for the Maricopa Association of Governments in 1993, the ASPC Lewis Complex Wastewater Treatment Plant is located within the "County Small Plant Planning Area" and the County has the responsibility of reviewing and approving the proposed wastewater facility. However, the Town of Buckeye has annexed a piece of land 0.25 miles from the perimeter of the prison facility and will also need to approve the project. The following addresses the feasibility criteria for Small Plants Outside of Municipal Small Plant Planning Area as required by Table 4-43 of the 208 Plan.

TECHNICAL CRITERIA

- Why is small plant desired?

With an expected wastewater influent flow 0.75 million gallons per day (mgd), a small on-site treatment plant is desired to treat sewage generated by the prison complex and to produce an acceptable effluent water quality for reuse and water conservation. The surrounding area has a very low population density and is not slated in any Master Plan for regional service in the future. Therefore, on-site treatment and effluent reuse is the most desirable option.

Alternatives to building an on-site treatment facility such as using an existing wastewater treatment plant would require building an expensive transport system. In addition, using other on-site treatment options like septic tanks becomes difficult at large flows of 0.75 mgd. Ultimately, both alternatives are poor choices when considering the associated limited reuse options and large costs.

- Why can't wastewater be treated at an existing facility?

The nearest wastewater treatment plant to the prison complex is more than ten miles away and is owned and operated by the Town of Buckeye. The cost of installing a transport system is too great, and the potential for local reuse is lost.

- What is the anticipated quality of the wastewater?

The majority of the wastewater produced at the prison will be composed of domestic waste, but will produce some commercial waste from cafeterias on-site. Grease interceptors will limit oils and greases from entering the treatment plant. The anticipated quality of the raw wastewater is based on data from existing prison facilities similar in size with comparable conditions.

BOD	370 mg/L
TSS	258 mg/L
Total N	37 mg/L

- How and why was small plant design and capacity selected?

Treatment processes in the on-site wastewater treatment plant will be capable of achieving effluent water quality standards set by the Aquifer Protection Permit (APP) and the strict Reclaimed Wastewater Reuse Permit, both of which are regulated by the Arizona Department of Environmental Quality (ADEQ). With the effluent quality limitations imposed by the ADEQ, the wastewater treatment plant is designed to produce the following effluent water quality:

Suspended Solids	10 mg/L
TDS	865 mg/L
Settleable Solids	0 mg/L
Biochemical Oxygen Demand	20 mg/L
Fecal Coliform Bacteria	200 CFU/100 ml)
pH	7.5
Turbidity	2 NTU
Enteric Virus	ND MPN/L
<i>Giardia lamblia</i>	ND MPN/L
Temperature	40°C
Nitrogen	10 mg/L
Fluoride	1.9 mg/L

To achieve these effluent quality requirements, the plant will utilize the following treatment processes:

- Influent Grinding
- Influent Pumping
- Fine Screening and Screenings Removal
- Extended Aeration with anoxic and oxic zones (for nitrification-denitrification)
- Secondary Clarification
- Tertiary Filtration
- UV Disinfection
- Effluent Storage and Pumping
- Aerobic Digestion
- Solids Drying

Three methods of secondary treatment were considered; oxidation ditch, sequencing batch reactor and extended aeration activated sludge processes. The extended aeration, activated sludge process was chosen for its stability under varying loading conditions and its simplicity of operation.

To provide redundancy and flexibility, to increase ease of maintenance, to minimize start-up problems with small flows, and to facilitate a short construction period, there are two secondary treatment trains. Each train will include an aeration basin, a secondary clarifier, and a sludge pumping station.

Disinfection using ultraviolet radiation (UV) is recommended as this process is easier and safer to operate and maintain than either gaseous or liquid chlorine. Chlorinated effluent may contain trihalomethanes (THMs) in excess of the allowable limits set forth in the Aquifer Protection Permit. Many smaller wastewater treatment plants in Arizona utilize UV disinfection.

Since the design criteria were based on the Aquifer Protection Permit and the Reclaimed Water Reuse Permit standard, the treatment plant will be designed to meet state and county regulations.

PLANNING CRITERIA

- Is proposed plant compatible with County adopted master plans, guidelines, etc., for the area?

The County Planning Area Map (Figure 4-26, MAG 208) does not indicate any master planned or approved developments within the ASPC Lewis Complex general location. In addition, there are no known guidelines or policies that apply to the area.

- Can the proposed plant be expanded to serve growing population?

The service area of the treatment plant is limited to the prison facility which has no planned expansion; therefore, the treatment plant is not expected to be expanded in the future. There is, however, sufficient land on site for considerable expansion of both the prison and the treatment facilities. Surrounding areas are not planned to be included in the service of the wastewater treatment plant dedicated to the prison.

- Will proposed plant adversely impact existing or approved nearby land uses?

The plant location and performance will not adversely impact existing or approved nearby land uses. The land uses in the surrounding areas to the north, west, and south are agricultural, while the land to the east is open desert. No negative responses were received in regards to the wastewater treatment plant, in fact, some of the agricultural land users expressed an interest in possibly using effluent for irrigation.

- Will there be a net water saving from effluent reuse?

The effluent produced from the treatment facility will be directly reused on softball fields, gardens, recreational fields, and turf farms all of which are located at the prison. Each month, an estimated 20 - 25 million gallons of effluent can be reused on these areas. All effluent not used for irrigation within the prison complex will be placed on the turf farm. A copy of the Reuse Water Balance is included in Attachment 3. All effluent from the wastewater treatment plant will be reused by on-site vegetation or the turf farm.

- Do nearby existing or proposed land uses indicate a need for a larger capacity sewage plant than that proposed?

The nearby existing or proposed land uses do not indicate a need for a sewage plant now or in the future as they have their own independent forms of wastewater treatment. The wastewater treatment plant at the Lewis Prison Complex will only be used by the prison.

DEVELOPMENT CRITERIA

- Who will fund construction, operation and maintenance costs? Is there adequate financial security to assure continual and proper operation and maintenance?

The entire prison complex and the wastewater treatment plant are funded by Arizona Department of Administration, and Arizona Department of Corrections will operate and maintain the prison

complex and the treatment plant. A copy of the Statement of Financial Responsibility is included in Attachment 4, but full financial documentation can be provided on request.

- Who will operate and maintain the plant and system?

The treatment plant will be operated and maintained by a state certified operator, employed by Arizona Department of Corrections, who will be responsible for the day-to-day plant operation and performance monitoring.

- What are anticipated capital and operation and maintenance costs?

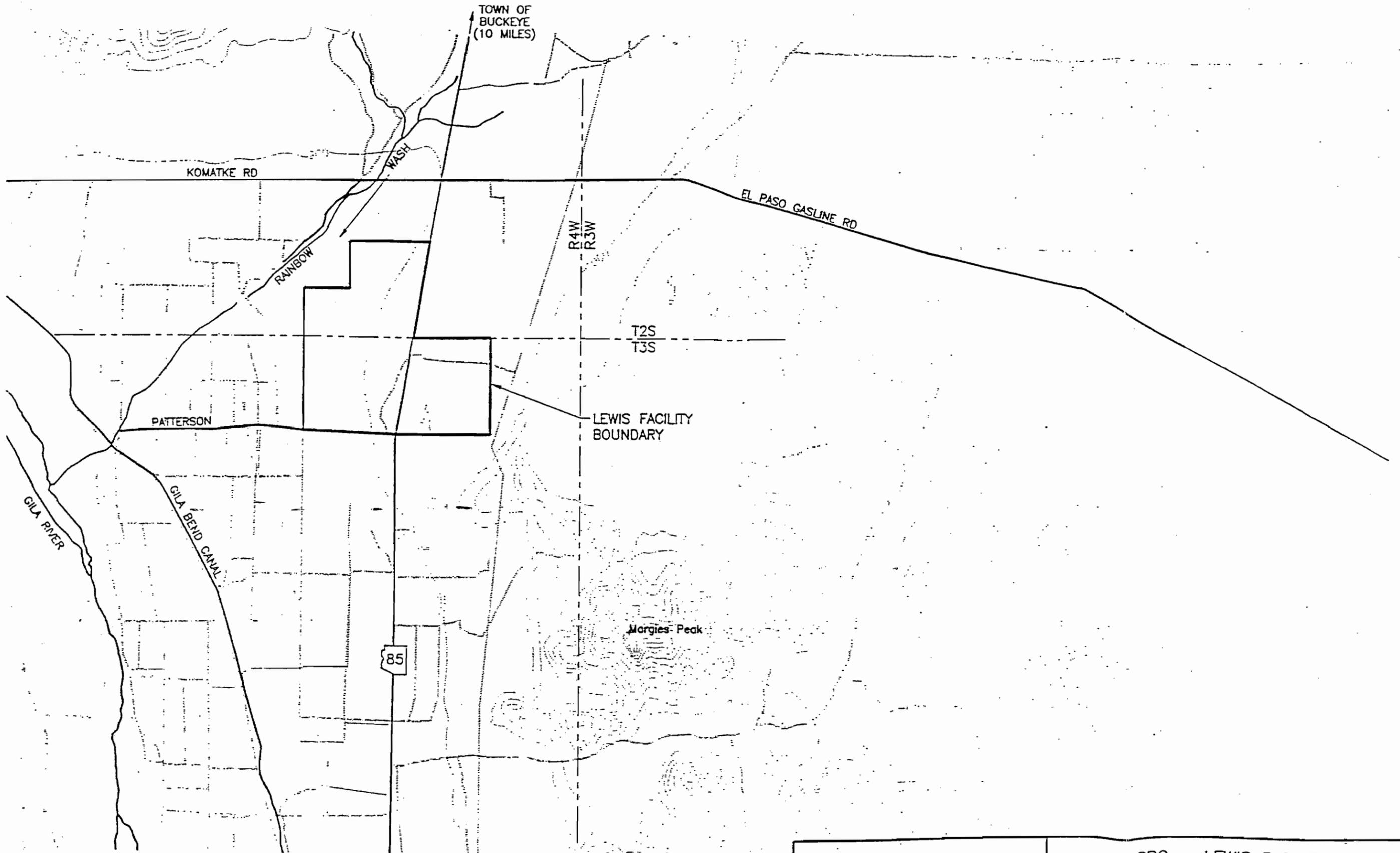
The capital cost of the treatment plant is estimated at 4.5 million dollars, and the estimated operation and maintenance costs are \$350,000 annually.

CONCLUSIONS

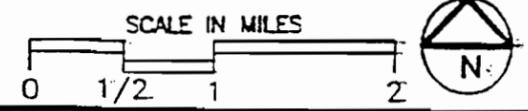
It is our opinion that the proposed facility is in full compliance with the 208 Water Quality Management Plan, and it is within the County jurisdiction to review and approve the plant construction.

ATTACHMENT NO. 1

VICINITY MAP

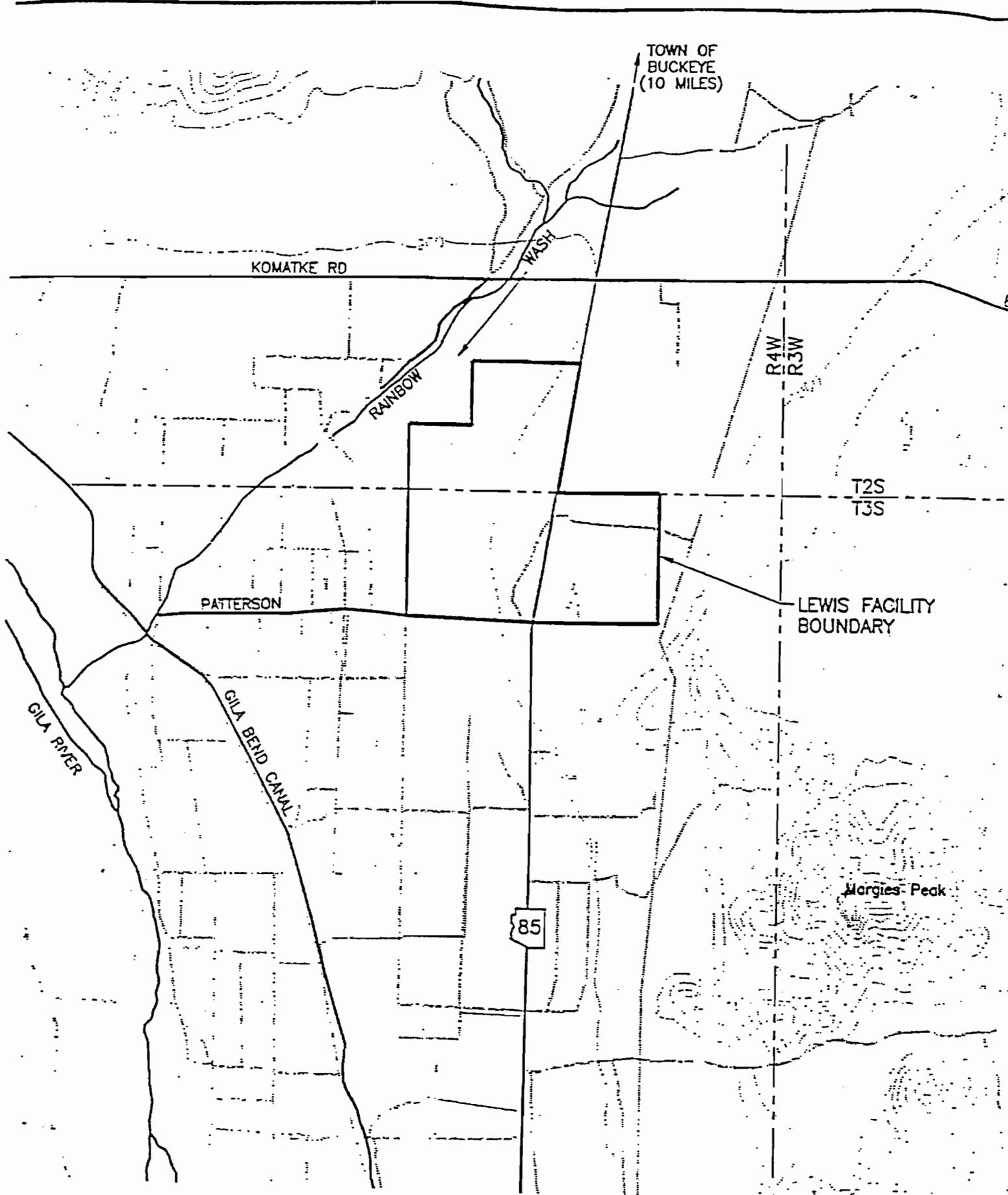


TOWN OF
GILA BEND
(14 MILES)



ASPC — LEWIS FACILITY
PROJECT SITE
VICINITY MAP

DRAFT



TOWN OF BUCKEYE (10 MILES)

KOMATKE RD

WASH

RAINBOW

R4W
R3W

T2S
T3S

PATTERSON

LEWIS FACILITY BOUNDARY

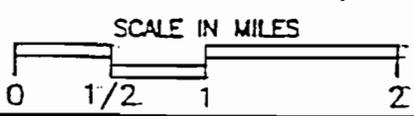
GILA RIVER

GILA BEND CANAL

85

Mojave Peak

TOWN OF GILA BEND (14 MILES)



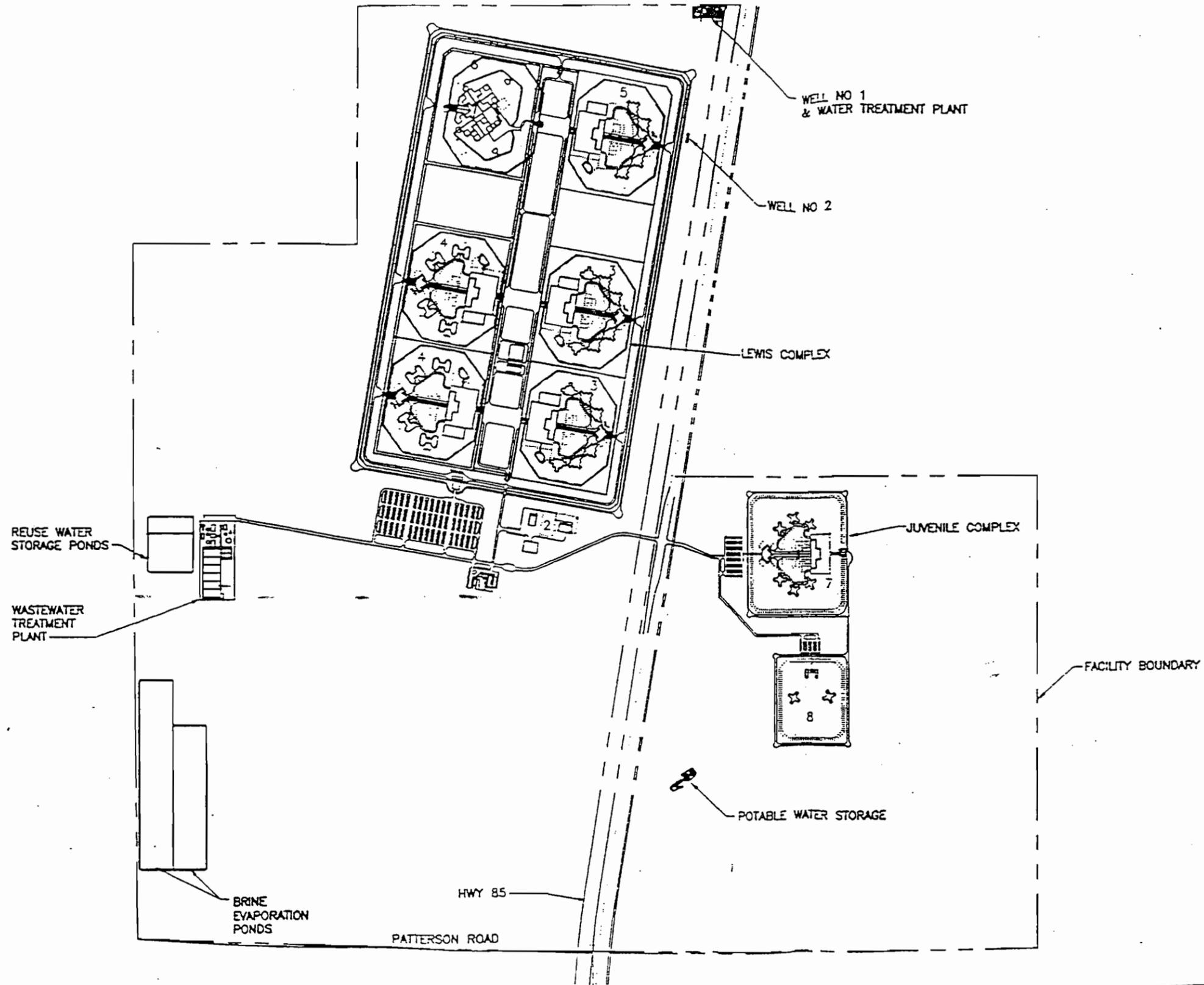
EL PASO GASLINE RD



ASPC - LEWIS FACILITY
PROJECT SITE
VICINITY MAP

DRAFT

ATTACHMENT NO. 2
OVERALL SITE PLAN



SITE PLAN
NOT TO SCALE



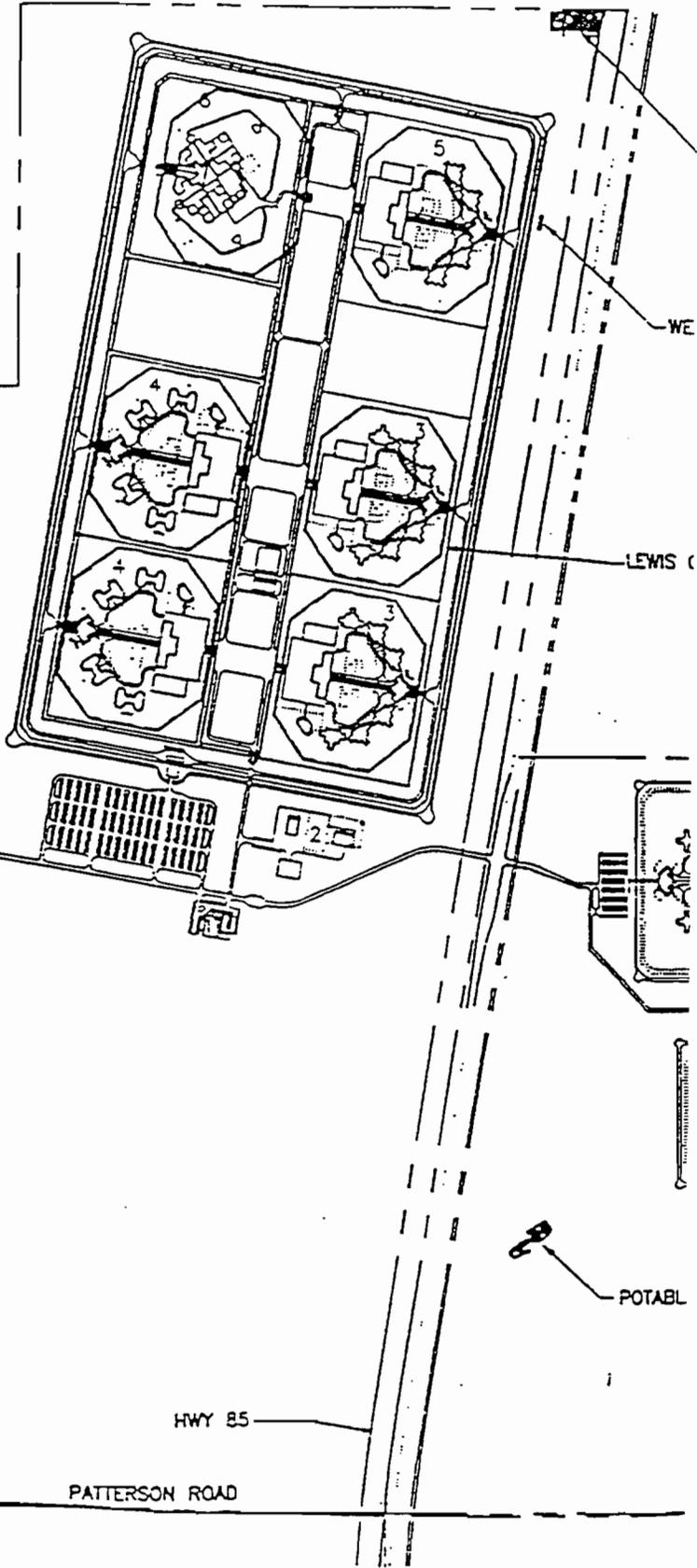
ASPC - LEWIS FACILITY
OVERALL SITE PLAN

DRAFT

REUSE WATER STORAGE PONDS

WASTEWATER TREATMENT PLANT

BRINE EVAPORATION PONDS



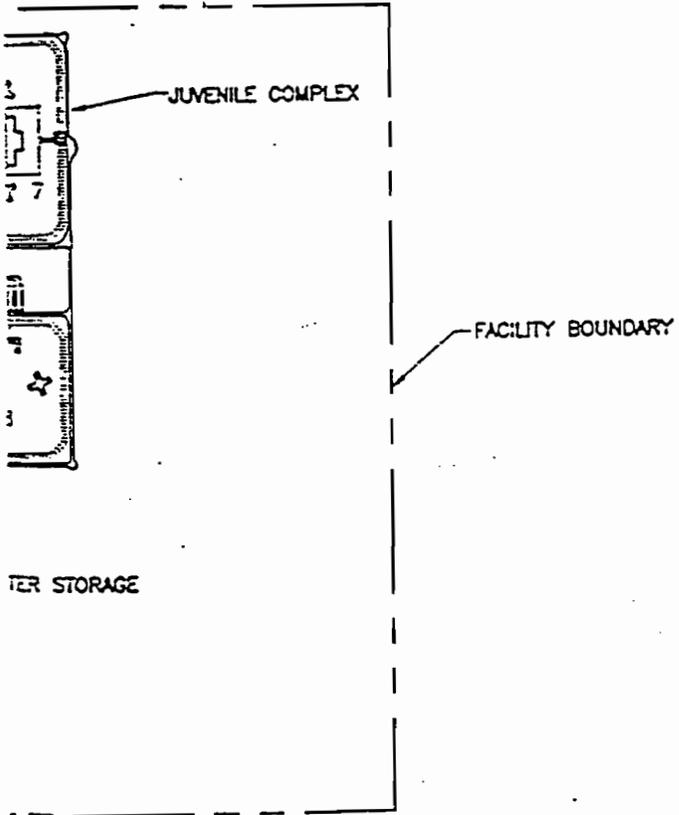
SITE PLAN
NOT TO SCALE



PL NO 1
WATER TREATMENT PLANT

02

15X



ASPC - LEWIS FACILITY
OVERALL SITE PLAN

DRAFT

ATTACHMENT NO. 3
WATER BALANCE

ATTACHMENT NO. 4
***STATEMENT OF FINANCIAL
RESPONSIBILITY***

File

Fife Symington
Governor



Rudy Serino
Director

RECEIVED

MAY 16 1997

ARIZONA DEPARTMENT OF ADMINISTRATION
GENERAL SERVICES DIVISION • 15 SOUTH 15TH AVENUE, SUITE 101
PHOENIX, ARIZONA 85007
(602) 542-1920 - (602) 542-1776

CAROLLO ENGINEERS
PHOENIX, ARIZONA

May 15, 1997

Arizona Department of Environmental Quality
3033 North Central Avenue
Phoenix, AZ 85012

RE: ASPC-Lewis
Statement of Financial Responsibility

To Whom It May Concern:

Please be advised that the Arizona Department of Administration (as Owner) and the Arizona Department of Corrections (as Operator) are financially capable of constructing, operating and closing the ASPC-Lewis Complex Wastewater Treatment Plant (WWTP). The construction of the WWTP is funded by Laws 1996, Second Regular Session, Chapter 337. The Department of Corrections operating budget is funded yearly by the Legislature and will cover the operation of the WWTP. Closure funding for the WWTP would be the subject of a future capital request to the Legislature and the Office of Strategic Planning and Budgeting.

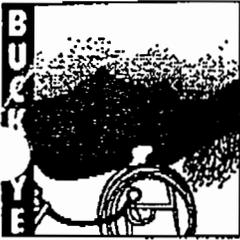
If you have any questions, I can be reached at 542-0697.

Sincerely,

Kent Bosworth, Assistant Director
General Services Division

cc: John Webster, ADOA Construction Services
Bruce Ringwald, ADOA Construction Services
Roger Berna, ADOA Construction Services
C/file

ATTACHMENT NO. 5
LETTERS



Town of Buckeye

March 12, 1998

Dale Bodiya
Maricopa County Environmental Services
1001 N. Central, Suite 150
Phoenix, AZ 85034

RE: Proposed wastewater treatment facilities for the ASPC Lewis/Juvenile Complex

Dear Mr. Bodiya:

This letter is in response to a request by Carollo Engineers to comment on the above referenced wastewater treatment facility. The Town of Buckeye does not have any objections to the proposed facility. If you should have any questions please do not hesitate to call me at 386-4691.

Sincerely,

A handwritten signature in cursive script that reads "Joseph Blanton".

Joseph Blanton, AICP
Planning and Development Director

xc: Delbert Self, Town Manager
Christine Hennemann, Carollo Engineers

ENVIRONMENTAL SERVICES
DEPARTMENT

Albert F. Brown, RS, MPA, Director

1001 N. Central Avenue, Suite 150
Phoenix, Arizona 85004



WATER AND WASTE MANAGEMENT
DIVISION

John A. Power, PE, Division Manager

(602) 506-6666
FAX (602) 506-6925
TT (602) 506-6704

March 24, 1998

Maricopa Association of Governments
302 North 1st Avenue, Suite 300
Phoenix, Arizona 85003

Attention: Ms. Lindy Bauer, Environmental Program Coordinator
Re: ASPC - Lewis Complex, MCESD# 971066

Dear Ms. Bauer:

Carolla Engineers has submitted plans to ADEQ for a small wastewater treatment plant for the ASPC - Lewis Complex in an unincorporated area located along Highway 85, approximately 0.25 miles south of the Town of Buckeye.

In accordance with the MAG 208 Water Quality Management Plan, Section 4.6.2 (Small Plant Process), an engineering feasibility report for the facility was submitted to this Department for review. Since the facility is located within three miles of the Town of Buckeye, comments from the Town were requested and received

Based on a review of the attached Revised Facility Report, dated March 1998, and the documents listed below, the Maricopa County Environmental Services Department has determined that the proposed plant for the ASPC - Lewis complex is acceptable and complies with the Small Plant Review and Approval Process under the MAG 208 Plan.

Water and Wastewater Master Plan, Final Report, January 3, 1997
Water and Wastewater Systems, Drawings, Volume 4 of 4
Water and Wastewater Systems, Specifications
Waste Water Reuse Infrastructure and Management Plan, May, 1997
ADEQ Review Response - Attachments
ADEQ Aquifer Protection Permit and Reuse Permit, December 26, 1997

As noted in the attached letter from the Town of Buckeye, the Town has no objections to the proposed facilities, and did not include any recommendations or comments which need to be included with the project.

Page 2 of 2
March 24, 1998
Ms. Lindy Bauer
ASPC - Lewis Complex, MCESD# 971066

If you have any questions or comments, please feel free to contact either Mr. Dale Bodiya, PE, or myself, at 506-6666.

Sincerely,

A handwritten signature in black ink that reads "John A. Power, PE." The signature is written in a cursive style with a large initial "J".

John A. Power, PE
Manager, Water and Waste Management Division

Attachments

cc (w/o attachments):

Mr. Albert F. Brown, RS, MPA, Director, MC Environmental Services Department

Mr. Ed Swanson, PE, ADEQ, Water Permits Section

Mr. Thomas M. Besett, PE, Carolla Engineers

Mr. Dale Bodiya, PE, Manager, Water / Wastewater Treatment Section