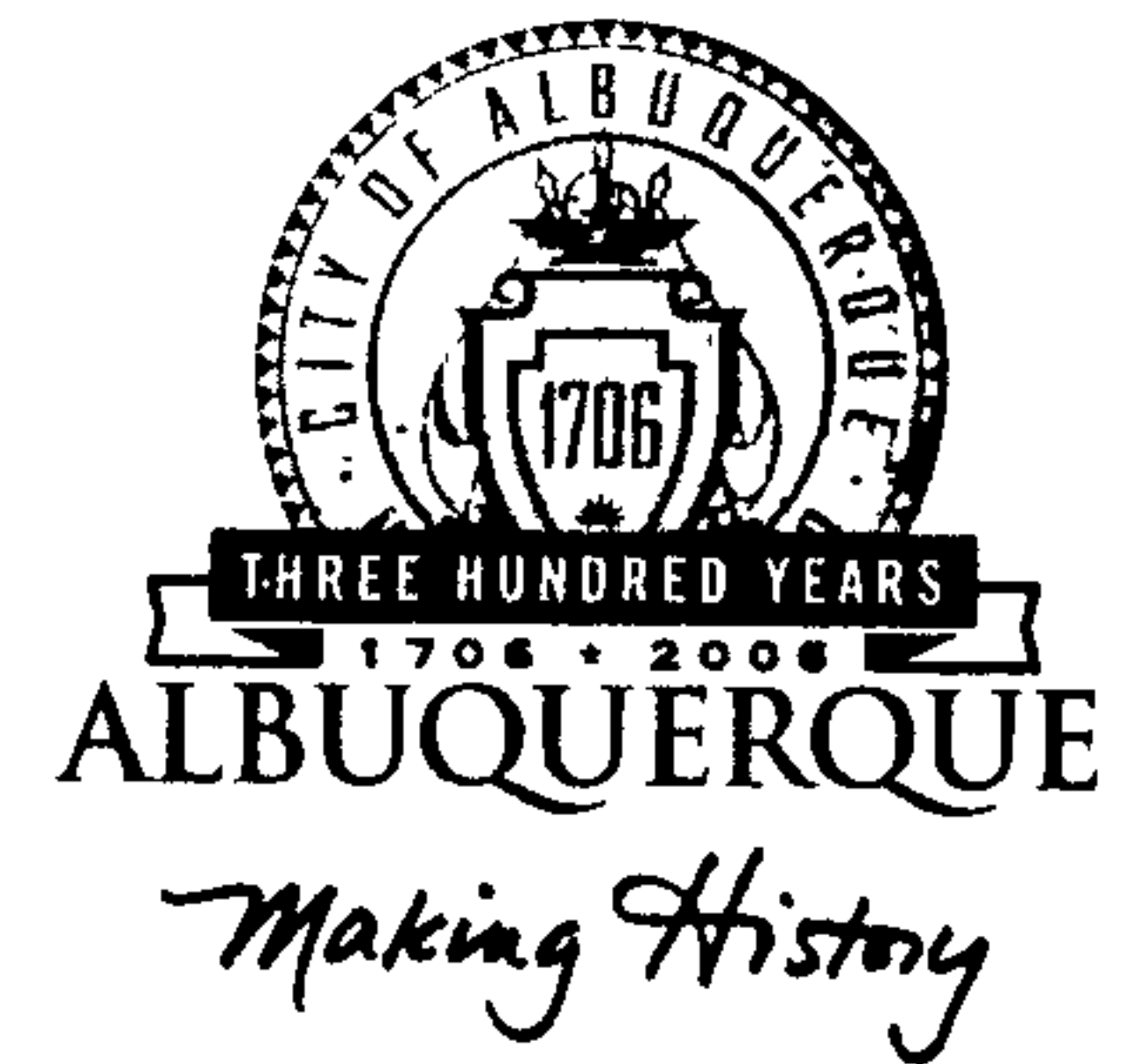


# CITY OF ALBUQUERQUE



June 7, 2005

Mr. Michael Brewer, P.E.  
**CH2M HILL, INC.**  
6001 Indian School Rd. NE  
Suite 350  
Albuquerque, NM 87110

**Re: EL OSO GRANDE NONPOTABLE WATER PUMP STATION**  
**10700 Osuna Rd. NE**  
**Approval of Permanent Certificate of Occupancy (C.O.)**  
**Engineer's Stamp dated 05/19/2003 (F-21/D72)**  
**Certification dated 06/06/2005**

P.O. Box 1293

Dear Mike:

Albuquerque

Based upon the information provided in your submittal received 06/07/2005, the above referenced certification is approved for release of Permanent Certificate of Occupancy by Hydrology.

New Mexico 87103

If you have any questions, you can contact me at 924-3982.

[www.cabq.gov](http://www.cabq.gov)

Sincerely,

Arlene V. Portillo  
Plan Checker, Planning Dept. - Hydrology  
Development and Building Services

C: Phyllis Villanueva  
File



# DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV. 1/28/2003rd)

PROJECT TITLE: El Oso Grande Nonpotable Water Pump Station  
DRB #: 02-DRB-01841 & EPC#: 02-EPC-008

ZONE MAP/DRG. FILE #: F-21 /D72  
WORK ORDER#: CIP No. 5267.07

LEGAL DESCRIPTION: : WESTERLY HALF OF TR F ACADEMY PLACE SUBD  
CITY ADDRESS: 10700 Osuna Rd., N.E.

ENGINEERING FIRM: CH2M HILL, Inc.  
ADDRESS: 6001 Indian School Rd., N.E. Suite 350  
CITY, STATE: Albuquerque, NM

CONTACT: Michael Brewer  
PHONE: (505) 884-5600  
ZIP CODE: 87110

OWNER: CITY OF ALBUQUERQUE - PWD  
ADDRESS: P.O. Box 1293  
CITY, STATE: Albuquerque, NM

CONTACT: James Chavez  
PHONE: (505) 768-2561  
ZIP CODE: 87102

ARCHITECT: Molzen-Corbin & Associates  
ADDRESS: 2701 Miles Rd., S.E.  
CITY, STATE: Albuquerque, NM

CONTACT: John Pate  
PHONE: (505) 242-5700  
ZIP CODE: 87106

SURVEYOR: Bradbury Stamm Construction Inc.  
ADDRESS: 3700 Paseo del Norte NE  
CITY, STATE: Albuquerque, NM

CONTACT: Jesse Vigil  
PHONE: (505) 765-1200  
ZIP CODE: 87113

CONTRACTOR: Bradbury Stamm Construction Inc.  
ADDRESS: 3700 Paseo del Norte NE  
CITY, STATE: Albuquerque, NM

CONTACT: Bill McCarty  
PHONE: (505) 765-1200  
ZIP CODE: 87113

## CHECK TYPE OF SUBMITTAL:

- ☐ DRAINAGE REPORT
- ☐ DRAINAGE PLAN 1<sup>st</sup> SUBMITTAL, **REQUIRES TCL or equal**
- ☐ DRAINAGE PLAN RESUBMITTAL
- ☐ CONCEPTUAL GRADING & DRAINAGE PLAN
- ☐ GRADING PLAN
- ☐ EROSION CONTROL PLAN
- ☒ ENGINEER'S CERTIFICATION (HYDROLOGY)
- ☐ CLOMR/LOMR
- ☐ TRAFFIC CIRCULATION LAYOUT (TCL)
- ☐ ENGINEERS CERTIFICATION (TCL)
- ☐ ENGINEERS CERTIFICATION (DRB APPR. SITE PLAN)
- ☐ OTHER

## CHECK TYPE OF APPROVAL SOUGHT:

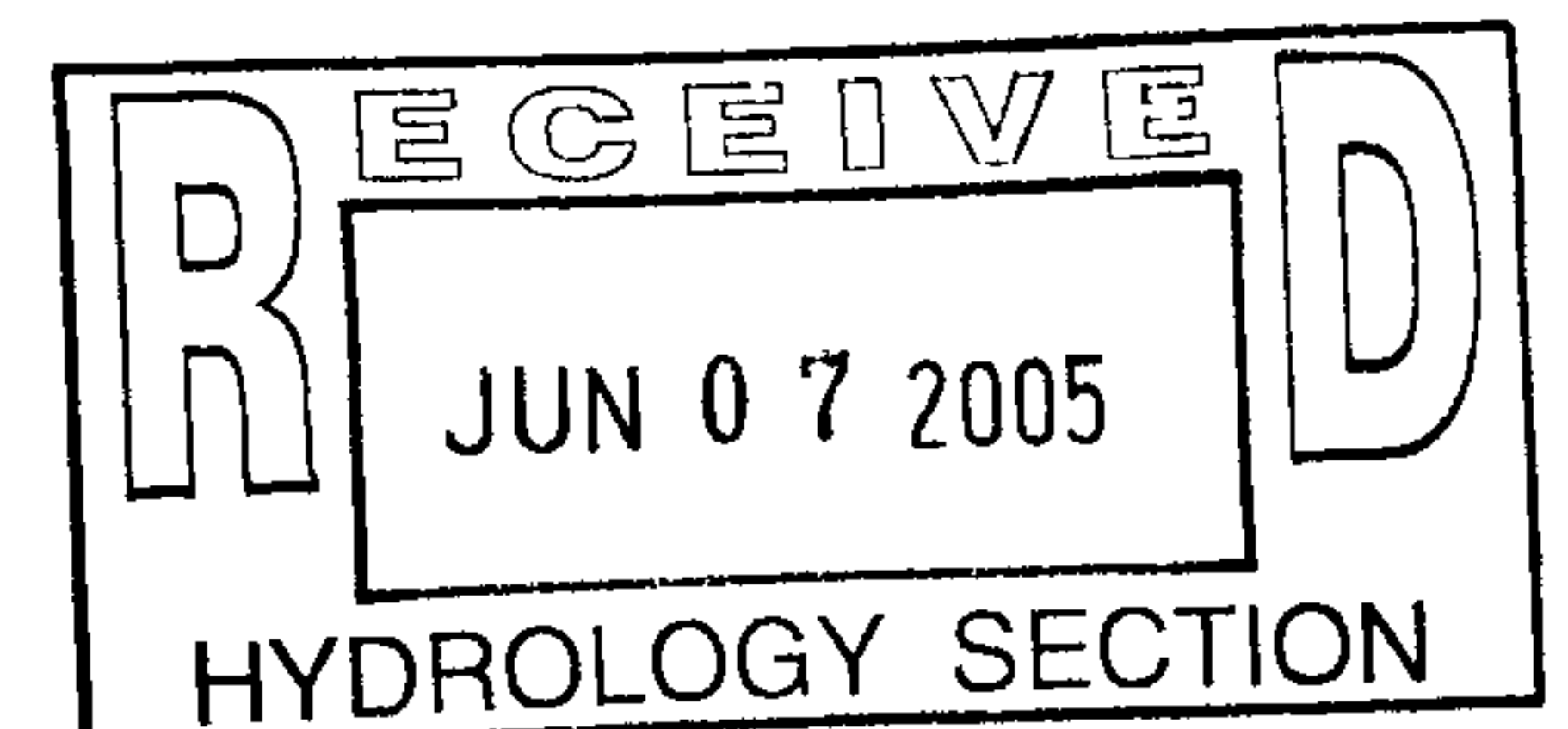
- ☐ SIA / FINANCIAL GUARANTEE RELEASE
- ☐ PRELIMINARY PLAT APPROVAL
- ☐ S. DEV. PLAN FOR SUB'D. APPROVAL
- ☐ S. DEV. PLAN FOR BLDG. PERMIT APPROVAL
- ☐ SECTOR PLAN APPROVAL
- ☐ FINAL PLAT APPROVAL
- ☐ FOUNDATION PERMIT APPROVAL
- ☐ BUILDING PERMIT APPROVAL
- ☒ CERTIFICATE OF OCCUPANCY (PERM.)
- ☐ CERTIFICATE OF OCCUPANCY (TEMP.)
- ☐ GRADING PERMIT APPROVAL
- ☐ PAVING PERMIT APPROVAL
- ☐ WORK ORDER APPROVAL
- ☐ OTHER (SPECIFY)

## WAS A PRE-DESIGN CONFERENCE ATTENDED:

- ☐ YES
- ☒ NO
- ☐ COPY PROVIDED

DATE SUBMITTED: 6/6/2005

BY: Michael Brewer



Requests for approvals of Site Development Plans and/or Subdivision Plats shall be accompanied by a drainage submittal. The particular nature, location and scope of the proposed development defines the degree of drainage detail. One or more of the following levels of submittal may be required based on the following:

1. **Conceptual Grading and Drainage Plan:** Required for approval of Site Development Plans greater than five (5) acres and Sector Plans.
2. **Drainage Plans:** Required for building permits, grading permits, paving permits and site plans less than five (5) acres.
3. **Drainage Report:** Required for subdivisions containing more than ten (10) lots or constituting five (5) acres or more.





# ***City of Albuquerque***

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

July 31, 2003

Michael Brewer, PE  
CH2M HILL, Inc.  
6001 Indian School Rd., NE Suite 350  
Albuquerque, NM 87110

**RE: El Oso Grande Non-potable Water Pump Station  
Grading and Drainage Plan (F-21/D72)  
Engineer's Stamp Dated May 19, 2003**

Dear Mr. Brewer:

The above referenced grading and drainage plan received July 15, 2003 is approved for Building Permit. Please attach a copy of the approved plan to the construction set. Prior to Certificate of Occupancy approval, an Engineer's Certification per the DPM is required on the above referenced plan.

This project requires a National Pollutant Discharge Elimination System (NPDES) permit. Refer to the attachment that is provided with this letter for details. If you have any questions please feel free to call the Public Works Hydrology section at 768-3654 (Charles Caruso) or 768-3645 (Brian Wolfe).

If you have any questions please call me at 924-3986.

Sincerely,

Bradley L. Bingham, PE  
Sr. Engineer, Planning Dept.  
Development and Building Services

C: Charles Caruso, Public Works Hydrology  
File



# DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV. 1/28/2003rd)

F-21/D72

PROJECT TITLE: El Oso Grande Nonpotable Water Pump Station  
DRB #: 02-DRB-01841 & EPC#: 02-EPC-008

ZONE MAP/DRG. FILE #: F-21  
WORK ORDER#: CIP No. 5267.07

LEGAL DESCRIPTION: : WESTERLY HALF OF TR F ACADEMY PLACE SUBD  
CITY ADDRESS: 10700 Osuna Rd., N.E.

ENGINEERING FIRM: CH2M HILL, Inc.  
ADDRESS: 6001 Indian School Rd., N.E. Suite 350  
CITY, STATE: Albuquerque, NM

CONTACT: Michael Brewer  
PHONE: (505) 884-5600  
ZIP CODE: 87110

OWNER: CITY OF ALBUQUERQUE - PWD  
ADDRESS: P.O. Box 1293  
CITY, STATE: Albuquerque, NM

CONTACT: James Chavez  
PHONE: (505) 768-2561  
ZIP CODE: 87102

ARCHITECT: Molzen-Corbin & Associates  
ADDRESS: 2701 Miles Rd., S.E.  
CITY, STATE: Albuquerque, NM

CONTACT: John Pate  
PHONE: (505) 242-5700  
ZIP CODE: 87106

SURVEYOR: Pacific Western Technologies, Ltd.  
ADDRESS: 7007 Wyoming Blvd., N.C. Bldg. C  
CITY, STATE: Albuquerque, NM

CONTACT: Philip Turner  
PHONE: (505) 294-5051  
ZIP CODE: 87109

CONTRACTOR: \_\_\_\_\_  
ADDRESS: \_\_\_\_\_  
CITY, STATE: \_\_\_\_\_

CONTACT: \_\_\_\_\_  
PHONE: \_\_\_\_\_  
ZIP CODE: \_\_\_\_\_

## CHECK TYPE OF SUBMITTAL:

- ☐ DRAINAGE REPORT
- ☐ DRAINAGE PLAN 1<sup>st</sup> SUBMITTAL, **REQUIRES TCL or equal**
- ☐ DRAINAGE PLAN RESUBMITTAL
- ☐ CONCEPTUAL GRADING & DRAINAGE PLAN
- ☒ GRADING PLAN
- ☐ EROSION CONTROL PLAN
- ☐ ENGINEER'S CERTIFICATION (HYDROLOGY)
- ☐ CLOMR/LOMR
- ☐ TRAFFIC CIRCULATION LAYOUT (TCL)
- ☐ ENGINEERS CERTIFICATION (TCL)
- ☐ ENGINEERS CERTIFICATION (DRB APPR. SITE PLAN)
- ☐ OTHER

## CHECK TYPE OF APPROVAL SOUGHT:

- ☐ SIA / FINANCIAL GUARANTEE RELEASE
- ☐ PRELIMINARY PLAT APPROVAL
- ☐ S. DEV. PLAN FOR SUB'D. APPROVAL
- ☐ S. DEV. PLAN FOR BLDG. PERMIT APPROVAL
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- ☐ CERTIFICATE OF OCCUPANCY (PERM.)
- ☐ CERTIFICATE OF OCCUPANCY (TEMP.)
- ☐ GRADING PERMIT APPROVAL
- ☐ PAVING PERMIT APPROVAL
- ☒ WORK ORDER APPROVAL
- ☐ OTHER (SPECIFY)

## WAS A PRE-DESIGN CONFERENCE ATTENDED:

- ☐ YES
- ☒ NO
- ☐ COPY PROVIDED

DATE SUBMITTED: 7/15/2003

RECEIVED  
JUL 15 2003  
HYDROLOGY SECTION  
BY: *Michael Brewer*

Requests for approvals of Site Development Plans and/or Subdivision Plats shall be accompanied by a drainage submittal. The particular nature, location and scope of the proposed development defines the degree of drainage detail. One or more of the following levels of submittal may be required based on the following:

1. **Conceptual Grading and Drainage Plan:** Required for approval of Site Development Plans greater than five (5) acres and Sector Plans.
2. **Drainage Plans:** Required for building permits, grading permits, paving permits and site plans less than five (5) acres.
3. **Drainage Report:** Required for subdivisions containing more than ten (10) lots or constituting five (5) acres or more.





# ***City of Albuquerque***

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

November 11, 2002

Mike Brewer, PE  
CH2M Hill, Inc.  
6001 Indian School NE, Ste 350  
Albuquerque, NM 87110

**Re: El Oso Grande NPSWRP Pump Station and Reservoir Drainage Report  
Engineer's Stamp dated 10-16-02 (F21/D72)**

Dear Mr. Brewer,

Based upon the information provided in your submittal dated 10-15-02, the above referenced report is approved for Site Plan for Building Permit action by the DRB. It is also approved for Work Order and Building Permit. Per your report, it appears that the upstream property will be draining across your property and using the existing storm drain at the park. I will require a crosslot drainage easement (addressing maintenance) on the plat.

If you have any questions, you can contact me at 924-3986.

Sincerely,

Bradley L. Bingham, PE  
Sr. Engineer, Planning Dept.  
Development and Building Services

C: file



## DRAINAGE INFORMATION SHEET

(EL OSO GRANDE NON POTABLE TRS. +  
PUMP STATION)

F-21/D72

APPLICANTS NAME: CITY OF ALBUQUERQUE PUBLIC WORKS DEPT.

ZONE ATLAS/GRNG. FILE #: F-21-Z

DRB#: \_\_\_\_\_

EPC#: 02EPC-00824

WORK ORDER #:

LEGAL DESCRIPTION: WESTERLY HALF OF TR F ACADEMY PLACE SUBD

CITY ADDRESS: SEE ABOVE

ENGINEERING FIRM: CH2M HILL INC.

CONTACT: MIKE BREWER

ADDRESS: 6001 INDIAN SCHOOL RD. N.E., SUITE 350 ABQ. NM 87110

PHONE: 505 884-5600

OWNER: CITY OF ALBUQUERQUE - PWD

CONTACT: JAMES CHAVEZ

ADDRESS: P.O. BOX 1293, ALBUQUERQUE, NM 87102

PHONE: 505 768-2562

ARCHITECT: MOLZEN CORBIN &amp; ASSOCIATES

CONTACT: JOHN PATE

ADDRESS: 2701 MILES ROAD SE.

PHONE: 242-5700

SURVEYOR: PACIFIC WESTERN TECHNOLOGIES

CONTACT: PHILIP W. TUNER

ADDRESS: 8338A COMANCHE N.E. ABQ. NM 87110

PHONE: 294-5051

CONTRACTOR: \_\_\_\_\_

CONTACT: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

PHONE: \_\_\_\_\_

## TYPE OF SUBMITTAL:

- ☒ DRAINAGE REPORT  
☒ DRAINAGE PLAN  
☐ CONCEPTUAL GRADING & DRAINAGE PLAN  
☐ GRADING PLAN  
☐ EROSION CONTROL PLAN  
☐ ENGINEER'S CERTIFICATION  
☐ OTHER

## PRE-DESIGN MEETING:

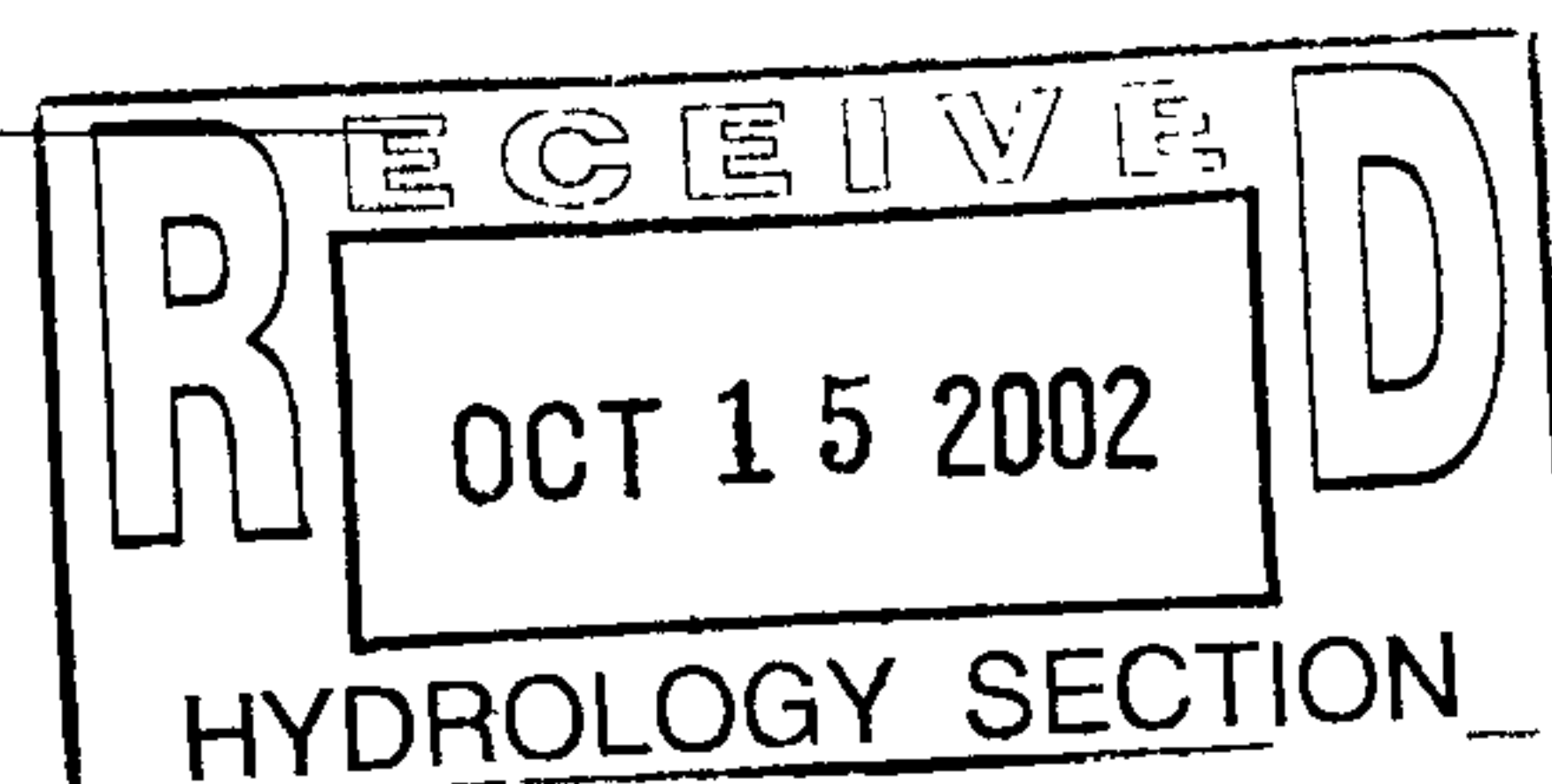
- ☐ YES  
☒ NO  
☐ COPY PROVIDED

## CHECK TYPE OF APPROVAL SOUGHT

- ☐ SKETCH PLAT APPROVAL  
☐ PRELIMINARY PLAT APPROVAL  
☐ S. DEV. PLAN FOR SUB'D APPROVAL  
☒ S DEV PLAN FOR BLDG. PERMIT APPROVAL  
☐ SECTOR PLAN APPROVAL  
☐ FINAL PLAT APPROVAL  
☐ FOUNDATION PERMIT APPROVAL  
☒ BUILDING PERMIT APPROVAL  
☐ CERTIFICATE OF OCCUPANCY APPROVAL  
☐ GRADING PERMIT APPROVAL  
☐ PAVING PERMIT APPROVAL  
☐ S.A.D. DRAINAGE REPORT  
☐ DRAINAGE REQUIREMENTS  
☐ SUBDIVISION CERTIFICATION  
☐ OTHER WORK ORDER (SPECIFY)

DATE SUBMITTED: 10/16/02

BY: Mike Brewer





**CH2MHILL** TRANSMITTAL

**TO:** City of Albuquerque  
Plaza Del Sol  
600 2nd Street, N.W.  
Albuquerque, NM 87103

**FROM:** Michael Brewer, ABQ  
CH2M HILL, Inc.  
6001 Indian School Rd., N.E.  
Suite 350  
Albuquerque, NM 87110

**ATTN:** Hydrology

**DATE:** October 16, 2002

**RE:** North I-25 Reclamation/Reuse System Nonpotable Surface Water Reclamation Project –  
El Oso Grande Reservoir and Pump Station Site

**PROJECT NUMBER:** 148973.NP.06.SP

**WE ARE SENDING YOU:**

♦ ATTACHED

SHOP DRAWINGS

PRINTS

COPY OF LETTER

UNDER SEPARATE COVER VIA

DOCUMENTS

SPECIFICATIONS

OTHER:

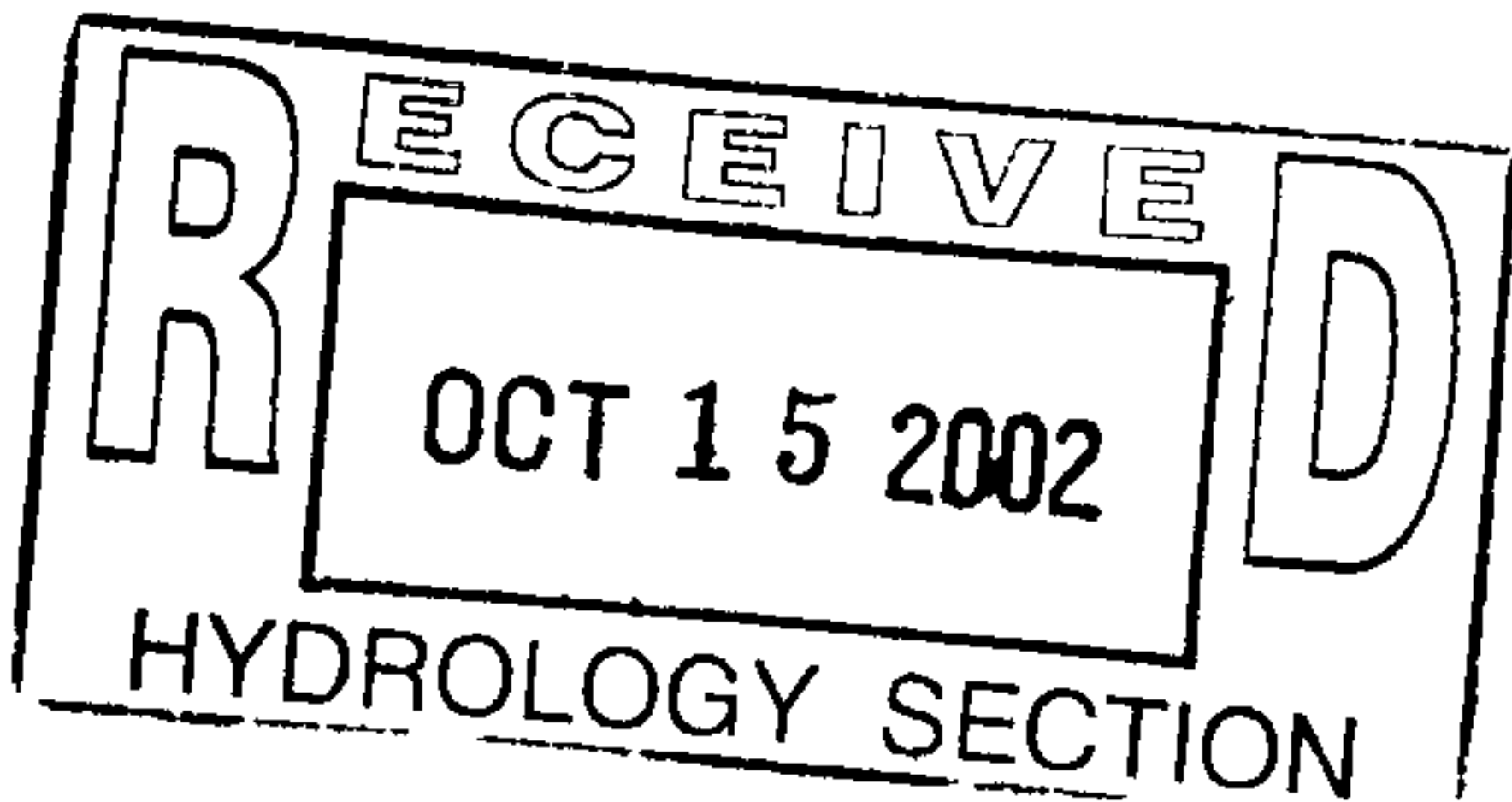
TRACINGS

CATALOGS

| QUANTITY | DESCRIPTION                                                                                           |
|----------|-------------------------------------------------------------------------------------------------------|
| 2        | Drainage Report/Plan for Site Development for the El Oso Grande Nonpotable Reservoir and Pump Station |
|          |                                                                                                       |
|          |                                                                                                       |
|          |                                                                                                       |
|          |                                                                                                       |
|          |                                                                                                       |
|          |                                                                                                       |

IF MATERIAL RECEIVED IS NOT AS LISTED, PLEASE NOTIFY US AT ONCE

**COPY TO:** James Chavez\COA-PWD  
Project File



CH2M HILL, Inc.  
6001 Indian School Rd., N.E.  
Suite 350  
Albuquerque, NM 87110

Voice: 884-5600

FAX: 883-7507

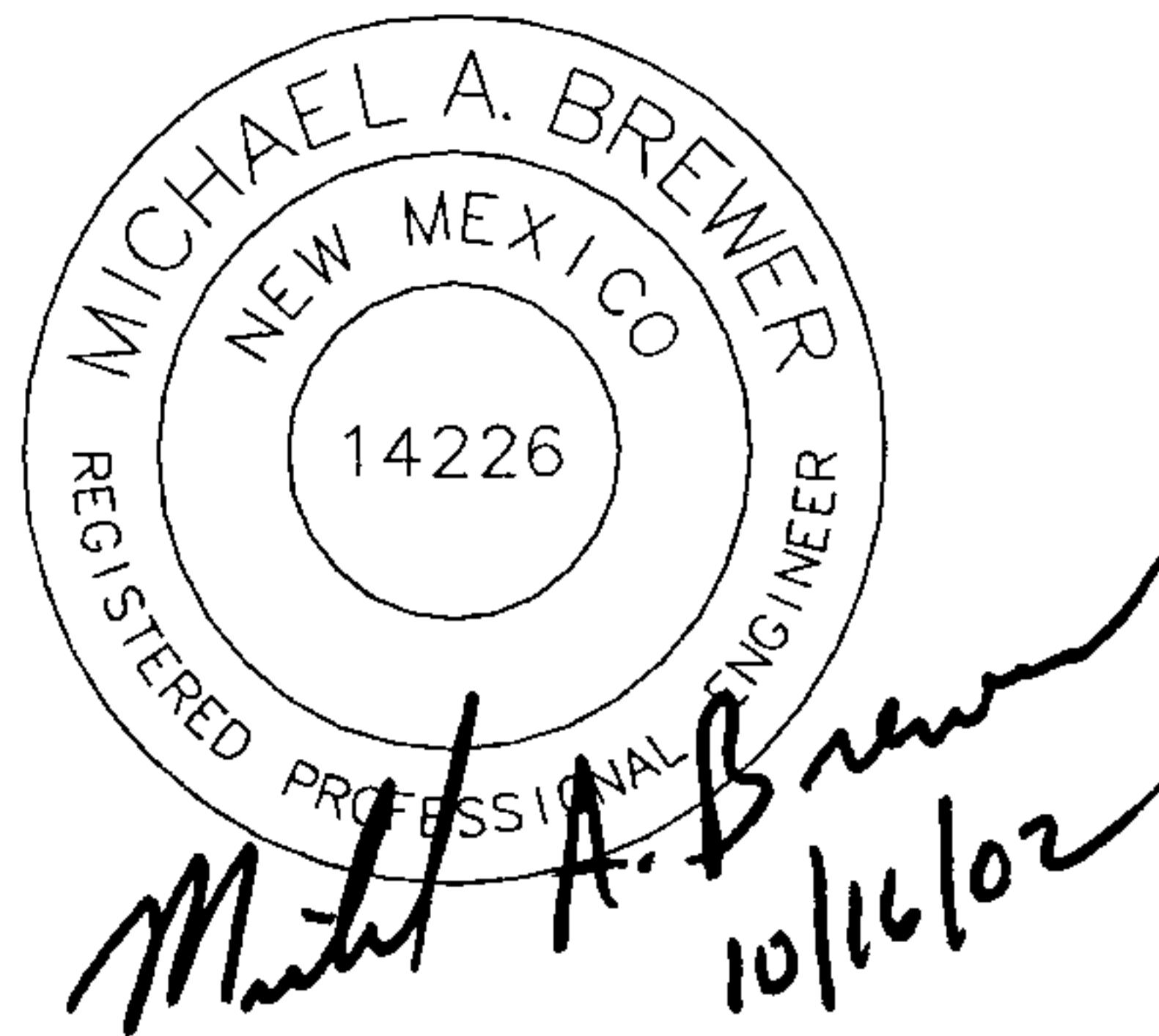


# CITY OF ALBUQUERQUE BERNALILLO COUNTY

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## NORTH I-25 RECLAMATION/REUSE SYSTEM NONPOTABLE SURFACE WATER RECLAMATION PROJECT

### DRAINAGE REPORT FOR EL OSO GRANDE RESERVOIR AND PUMP STATION SITE



The following items concerning the El Oso Grande Reservoir site grading and drainage improvements are contained herein:

- Vicinity Map
- FEMA Map
- Existing and Proposed Basin Maps
- Site Grading and Drainage Plan for Proposed Improvements at the El Oso Grande Reservoir and Pump Station Site
- Calculations



The site of the proposed improvements, as shown on the Site Vicinity Map (Attachment A), lies on the north side of the Bear Canyon Arroyo drainage easement and approximately 420 feet west of the centerline of Juan Tabo Blvd. Access to the proposed site will be provided via a gravel surfaced road connecting to the cul-de-sac formed by the junction of Sereno Drive and Osuna Road.

Improvements to the site include construction of a 1.15-million-gallon, below-grade nonpotable water storage reservoir, pump station, associated piping and appurtenances, site grading, gravel road, water and sewer connections, and landscaping.

The runoff calculations (see Attachment E) analyze the existing and fully developed conditions for the 100-year, 6-hour rainfall event for the proposed site development. The Rational Method was used to quantify the peak rate of discharge and the Soil Conservation Service (SCS) method was used to quantify the volume of runoff. Both methods were used in accordance with the City of Albuquerque *Development Process Manual* (DPM), section 22.2.

As shown on the FEMA Flood Boundary and Floodway Map, Panel 144 of 825, dated 4/2/2002 (Attachment B), the site lies within Zone X.

## Existing Conditions

The existing site and drainage boundary is shown on Attachment C and comprises an area of 3.76 acres and is not currently developed. Site runoff flows generally from East to West across the site.

Surface runoff from the existing site is currently collected in a depression at the southeast corner of the existing Ponderosa Reservoir Number Two property and conveyed offsite by 18" RCP to the Bear Canyon Arroyo.

## Proposed Improvements

Proposed improvements will consist of the construction of an 90-foot diameter, 1.15-million-gallon, below-grade, nonpotable water storage reservoir, pump station, associated underground utilities, site grading, and gravel access road as shown on the site grading and drainage plan (Attachment F). Underground utilities and appurtenances will include a 20-inch and 18-inch reuse water pipeline and emergency reservoir overflow piping.

The existing site will be regraded such that drainage on-site will be collected and conveyed to the existing 18" storm drain on the adjacent property which presently services the site. The fully developed site and drainage boundary are shown on Attachment D. Access to the proposed site will be provided by a 24-foot wide asphalt and gravel drive connected to Osuna Road.



## Storm Sewer Capacity

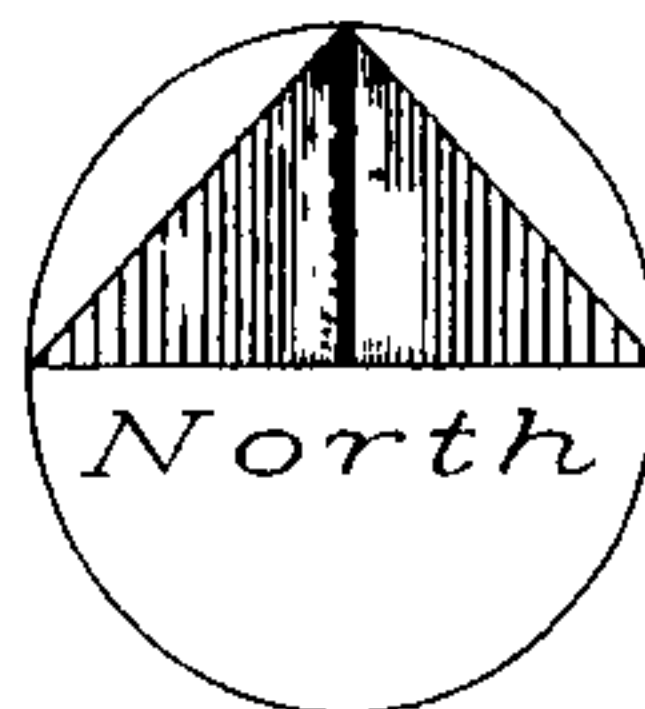
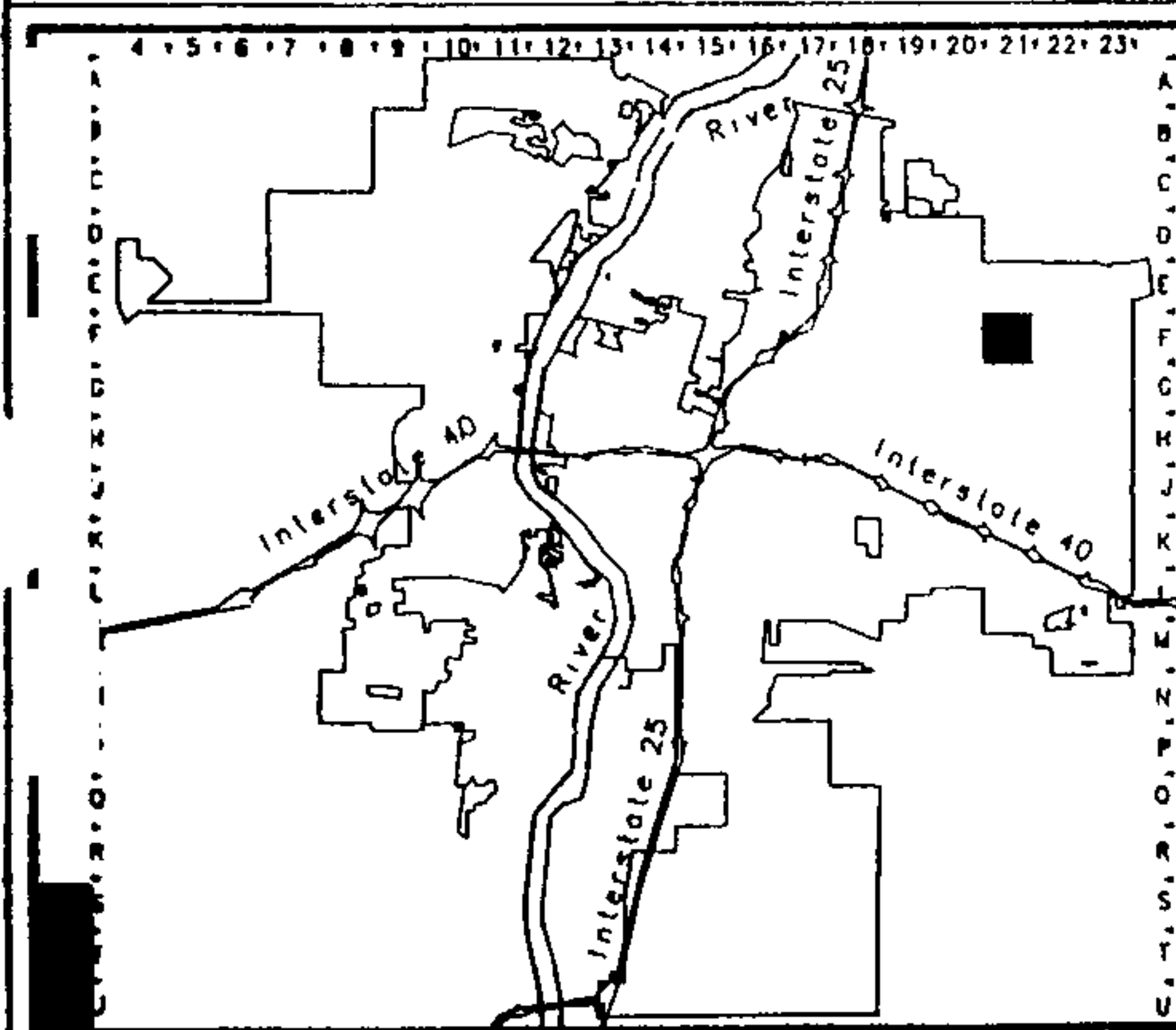
The storm water runoff, from the existing site ( $Q_{100} = 13.92$  cfs), is collected at the southeast corner of the Ponderosa Reservoir Number Two property and conveyed to Bear Canyon Arroyo by an 18" RCP pipe. The fully developed site conditions flow ( $Q_{100} = 15.36$  cfs) is proposed to be conveyed by the same drainage structure.

The new reservoir will have an emergency overflow capable of delivering 2,500 gpm, or 5.59 cfs to Bear Canyon Arroyo. The overflow will be piped to a dedicated manhole and an 18" RCP drainage structure will convey the flow to the arroyo. See Attachment F.

## Attachments

- A. Site Vicinity Map
- B. 100 Year Flood Plane in the Vicinity of the Proposed El Oso Grande Reservoir and Pump Station showing location of proposed development site
- C. Map showing existing drainage basin at the proposed development site
- D. Map showing fully developed drainage basin at the proposed development site
- E. Calculations on existing and proposed runoff flow and volume
- F. Site Grading and Drainage Plan for the Proposed Nonpotable Reservoir and Pump Station Site
- G. Hand calculations
- H. Site Landscaping Plan





750 375 0 750

Scale 1" = 750'

**A**lbuquerque **G**eographic **I**nformation **S**ystem  
 ▲ City of Albuquerque

© Planning Department July 07, 1993

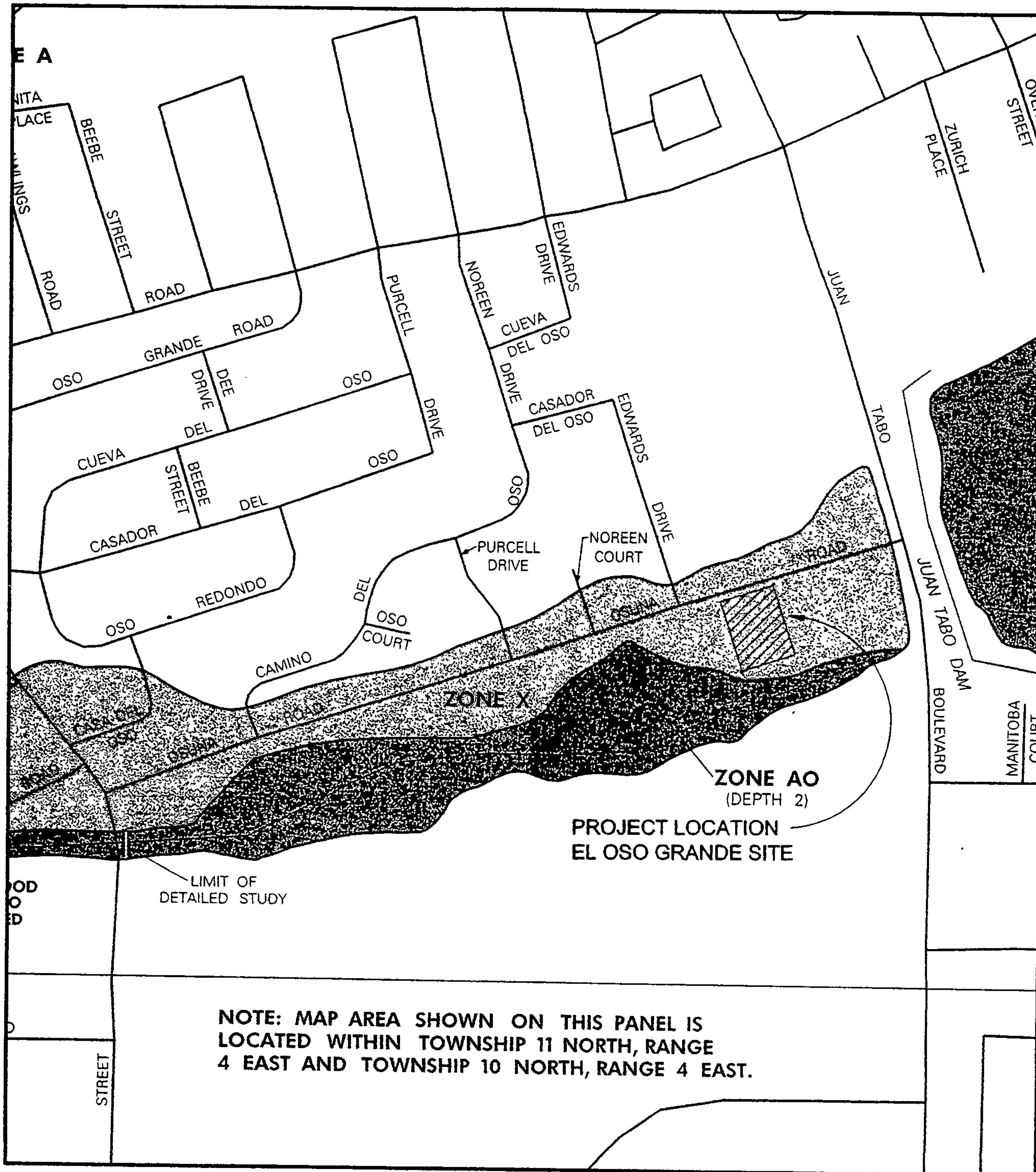
T11N  
R4E  
SEC 33

1-021-061

**F-21-Z**

## ATTACHMENT A





APPROXIMATE SCALE IN FEET  
500 0 500

NATIONAL FLOOD INSURANCE PROGRAM

**FIRM**  
FLOOD INSURANCE RATE MAP  
BERNALILLO COUNTY,  
NEW MEXICO AND  
INCORPORATED AREAS

PANEL 144 OF 825  
(SEE MAP INDEX FOR PANELS NOT PRINTED)

| CONTAINS:<br>COMMUNITY | NUMBER | PANEL | SUFFIX |
|------------------------|--------|-------|--------|
| ALBUQUERQUE CITY OF    | 350002 | 0144  | E      |

MAP NUMBER  
35001C0144 E

MAP REVISED:  
APRIL 2, 2002

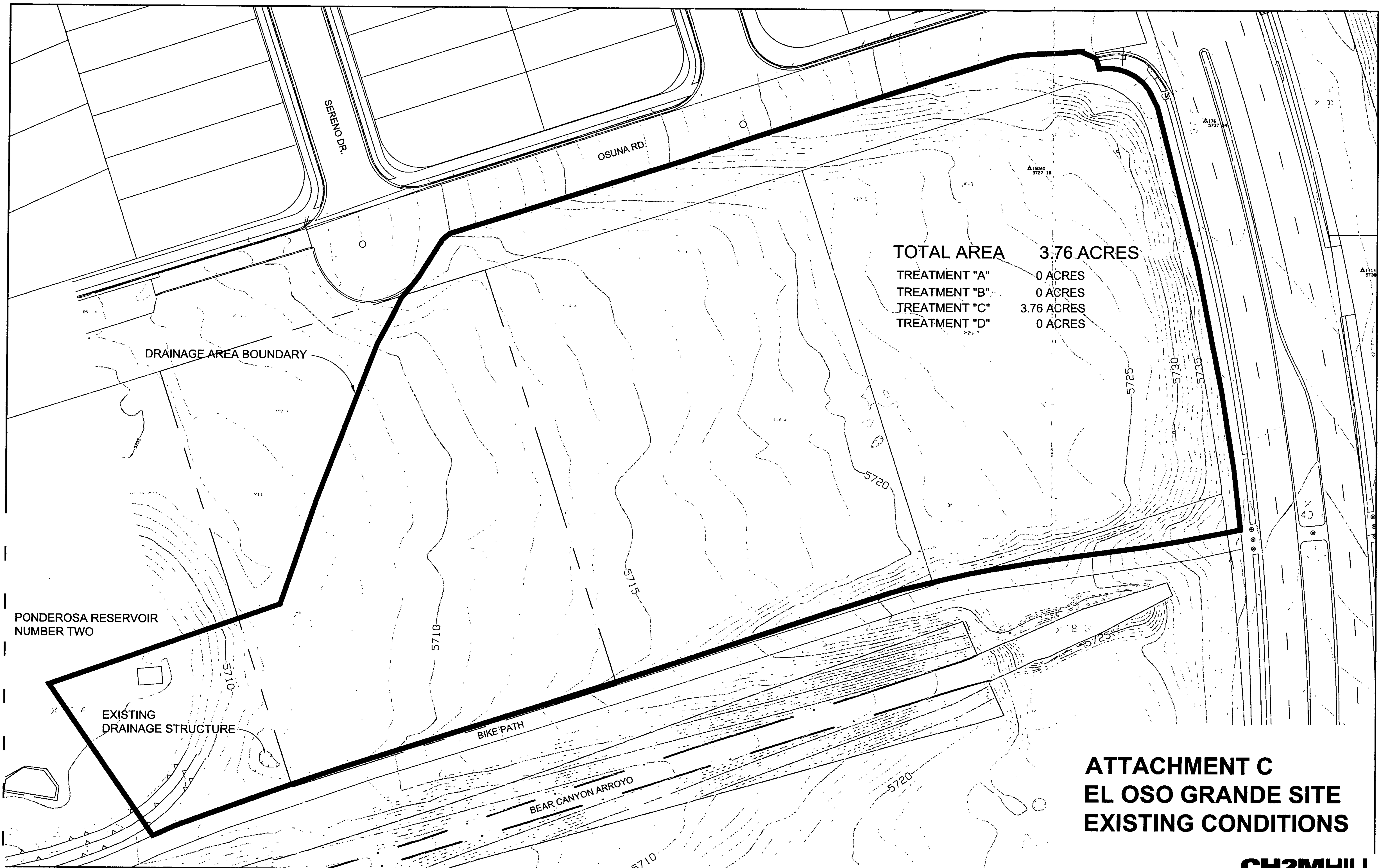


Federal Emergency Management Agency

NOTE: MAP AREA SHOWN ON THIS PANEL IS  
LOCATED WITHIN TOWNSHIP 11 NORTH, RANGE  
4 EAST AND TOWNSHIP 10 NORTH, RANGE 4 EAST.

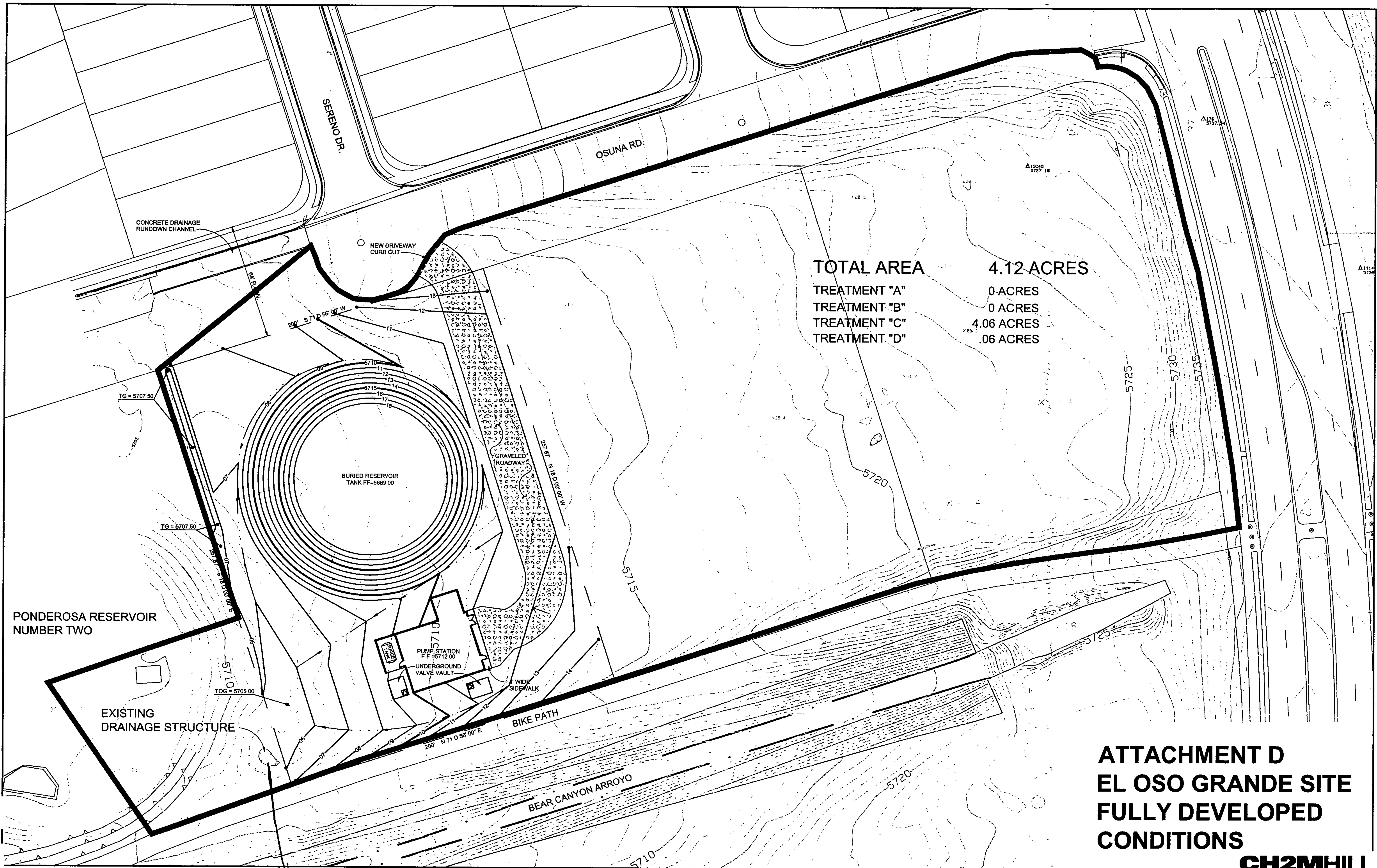
This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at [www.msc.fema.gov](http://www.msc.fema.gov)





**ATTACHMENT C  
EL OSO GRANDE SITE  
EXISTING CONDITIONS**





**ATTACHMENT D**  
**EL OSO GRANDE SITE**  
**FULLY DEVELOPED**  
**CONDITIONS**  
**CH2MHILL**



## ATTACHMENT E

The following calculations quantify the change in runoff flow and volumes due to the proposed site improvements.

### Ground Cover Information

From SCS Bernalillo County Soil Survey

Sheet 21 Soil Type for This Site is: **EmD – Embudo – gravelly fine sandy loam**

Hydrologic Soil Group: **B**

From DPM Section 22.2 Table A-1: Precipitation Zone for this site is **Zone 4** (East of Eubank, North of Interstate 40; and East of the East boundary of Range 4 East, South of Interstate 40)

Land Treatments Present:

- A** - Soil uncompacted by human activity with 0-10% slopes. Native grasses, weeds and shrubs in typical densities with minimal disturbance to grading, ground cover and infiltration capacity.
- B** - Irrigated lawns (slope < 10%), native grasses, weeds and shrubs, and soil uncompacted by human activity (slope 10%<20%)
- C** - Soil compacted by human activity. Minimal vegetation, vacant lots, unpaved parking/roads, gravel or rock on plastic.
- D** - Impervious areas, pavement and roofs.

### Time of Concentration

$T_c$  (Inches/Hour) per  
DPM Section 22.2 **= 0.2 hours = 12 minutes**

### 100 Year 6-Hour Depth (R)

“R” Depth (Inches) per  
DPM Section 22.2 Table A-2 **= 2.90 inches**

### Rational Method

Discharge (cfs):  **$Q = CiA$**

Where: **C = Runoff Coefficient** (from DPM Section 22.2 Table A-11)  
**i = From DPM Section 22.2 Table A-10 = 5.61 in/hr**  
**A = Area** (acres)

### SCS Method

Volume (cf):  **$V = 3630 \times \Sigma(E \times A)$**

Where **E = Excess Precipitation “E”, from DPM Section 22.2, Table A-8.**  
**A = Area** (acres)  
**3630 = conversion factor** (acre-feet to cubic feet)



## Existing Conditions

### Site Data

Area = 3.76 ac.

| Land Treatments                                | Area<br>(acres) | Runoff<br>Coefficient (C) | Excess<br>Precipitation (E) |
|------------------------------------------------|-----------------|---------------------------|-----------------------------|
| Undeveloped, Uncompacted<br>Area (Treatment A) | 0.00            | 0.39                      | 0.80                        |
| Landscaped Area (Treatment B)                  | 0.00            | 0.52                      | 1.08                        |
| Undeveloped Area<br>(Treatment C)              | 3.76            | 0.66                      | 1.46                        |
| Impervious Area (Treatment D)                  | 0.00            | 0.94                      | 2.64                        |

$$Q_{100} = \Sigma(CiA) = (0.66)(5.61)(3.76)$$

$$Q_{100} = 13.92 \text{ cfs}$$

Area impervious = 0.00 ac.: % impervious = 0.00%

$$V_{100} = 3630 \times \Sigma(E \times A) = 3630 [(1.46)(3.76)] = 19,927 \text{ cf}$$

## Fully Developed Conditions

### Site Data

Area = 4.12 ac.

| Land Treatments                                | Area<br>(acres) | Runoff<br>Coefficient (C) | Excess<br>Precipitation (E) |
|------------------------------------------------|-----------------|---------------------------|-----------------------------|
| Undeveloped, Uncompacted<br>Area (Treatment A) | 0.00            | 0.39                      | 0.80                        |
| Landscaped Area (Treatment B)                  | 0.00            | 0.52                      | 1.08                        |
| Undeveloped Area<br>(Treatment C)              | 4.05            | 0.66                      | 1.46                        |
| Impervious Area (Treatment D)                  | 0.07            | 0.94                      | 2.64                        |

$$Q_{100} = \Sigma(CiA) = (0.66)(5.61)(4.06) + (0.94)(5.61)(0.06)$$

$$Q_{100} = 15.36 \text{ cfs}$$

Area impervious = 0.06 ac.: % impervious = 1.70%

$$V_{100} = 3630 \times \Sigma(E \times A) = 3630 [(1.46)(4.06) + (2.64)(0.06)] = 22,135 \text{ cf}$$



---

## Comparison

Change in  $Q_{100} = 15.36 \text{ cfs} - 13.92 \text{ cfs} = 1.44 \text{ cfs}$  (increase)

Change in  $V_{100} = 22,135 \text{ cf} - 19,927 \text{ cf} = 2,208 \text{ cf}$  (increase)



## TIME OF CONCENTRATION

$$t_c = (L_1/V_1 + L_2/V_2 + \dots + L_n/V_n) / 3600 \text{ SECONDS FOR } L < 4000'$$

$$V = 10 (K) \sqrt{S}$$

WHERE:  $K = 1$  FROM DPM SEC 22.2 TABLE B-1

$$S = (5736' - 5703.5') / 644' = .053$$

WHERE: 5736' = ELEV. NE CORNER

5703.5' = INV. ELEV. CATCHMENT PIPE

644' = LENGTH - NE CORNER - CATCHMENT

$$V = 10 (1) \sqrt{.053} = 2.3 \text{ FT/S}$$

$$t_c = (644' / (2.3 \text{ FT/S})) / 3600 \text{ S/HR} = .074 \text{ HR}$$

$$.074 \text{ HR} < .2 \text{ HR} \quad \text{USE } .2 \text{ HR}$$

## TURN OFF FLOW AND VOLUME (PRESENT CONDITIONS)

$$Q = C I A$$

WHERE:  $C = .66$  TREATMENT C, ZONE 4

FROM DPM SEC 22.2 TABLE A-11

 $I = 5.61 \text{ IN/HR}$  FROM DPM SEC 22.2 TABLE A-10 $A = 3.76 \text{ ACRE}$ 

$$Q = .66 (5.61) (3.76) = 13.92 \text{ CFS}$$

$$V = 3630 (EXA)$$

WHERE:  $A = 3.76 \text{ ACRE}$  $E = 1.46 \text{ IN}$  FROM DPM SEC 22.2 TABLE A-4

$$V = 3630 (1.46 (3.76)) = 19,927 \text{ CF}$$



## RUNOFF FLOW AND VOLUME (FULLY DEVELOPED CONDITIONS)

$$Q = E(C \cdot A)$$

| WHERE: | LAND TREATMENT | AREA | C   | E    |
|--------|----------------|------|-----|------|
| "C"    | UNDEVELOPED    | 4.06 | .66 | 1.46 |
| "D"    | IMPERVIOUS     | .06  | .94 | 2.64 |

$$L = 5.61 \text{ IN/HR FROM DPM SEC 22.2 TABLE A-10}$$

$$Q = (.66)(5.61)(4.06) + (.94)(5.61)(.06)$$

$$Q = 15.03 + .316 = 15.35 \text{ CFS}$$

$$V = 3630 E(EA)$$

$$3630 [(1.46)(4.06) + (2.64)(.06)] = 22092 \text{ CF}$$

## CHANGE IN Q:

$$15.35 \text{ CFS} - 13.92 \text{ CFS} = 1.44 \text{ CFS INCREASE}$$

## CHANGE IN V:

$$22,135 \text{ CF} - 19,927 \text{ CF} = 2208 \text{ CF INCREASE}$$



CAPACITY OF EXISTING STORM DRAIN  
(CONDOROSA RESERVOIR)

$$D = 18"$$

$$\text{INVERT UP} = 5703.5'$$

$$\text{INVERT DOWN} = 5699.0'$$

$$L = 60'$$

$$S = (5703.5 - 5699.0) / 60' = .075$$

MANNING'S EQUATION - ASSUME FULL PIPE  
FLOW -

$$Q = \frac{K}{n} A R^{2/3} S^{1/2}$$

WHERE:

$$K = 1.49$$

$$n = .014 \text{ ROUGH CONCRETE PIPE}$$

$$A = (1.5)^2 \pi / 4 = 1.77 \text{ FT}^2$$

$$R = \frac{\text{AREA}}{\text{WET PERIM}} = \frac{1.77 \text{ FT}^2}{\pi (1.5 \text{ FT})} = \frac{1.77 \text{ FT}^2}{2.36 \text{ FT}}$$

$$= .75 \text{ FT}$$

$$S = .075$$

$$Q = \frac{1.49}{.014} (1.77) (.75)^{2/3} (.075)^{1/2} = 43 \text{ CFS}$$

$$Q (\text{FULL DEVELOPED}) = 15.36 \text{ CFS} \quad \underline{\underline{O.K.}}$$

THE EXISTING 18" RCP STORM DRAIN WILL HAVE  
AN EXCESS CAPACITY OF 27.64 CFS AFTER  
DEVELOPMENT.



## DRAINAGE INFORMATION SHEET

F-21/D72

APPLICANTS NAME: CITY OF ALBUQUERQUE PUBLIC WORKS DEPT. ZONE ATLAS/GRNG. FILE #: F-21-ZDRB#: \_\_\_\_\_ EPC#: 02EPC-00824 WORK ORDER #: \_\_\_\_\_LEGAL DESCRIPTION: WESTERLY HALF OF TR F ACADEMY PLACE SUBD

CITY ADDRESS: \_\_\_\_\_ SEE ABOVE

ENGINEERING FIRM: CH2M HILL INC. CONTACT: MIKE BREWERADDRESS: 6001 INDIAN SCHOOL RD. N.E., SUITE 350 ABQ. NM 87110 PHONE: 505 884-5600OWNER: CITY OF ALBUQUERQUE - PWD CONTACT: JAMES CHAVEZADDRESS: P.O. BOX 1293, ALBUQUERQUE, NM 87102 PHONE: 505 768-2562ARCHITECT: MOLZEN CORBIN & ASSOCIATES CONTACT: JOHN PATEADDRESS: 2701 MILES ROAD SE PHONE: 242-5700SURVEYOR: PACIFIC WESTERN TECHNOLOGIES CONTACT: PHILIP W. TUNERADDRESS: 8338A COMANCHE N.E. ABQ, NM 87110 PHONE: 294-5051

CONTRACTOR: \_\_\_\_\_ CONTACT: \_\_\_\_\_

ADDRESS: \_\_\_\_\_ PHONE: \_\_\_\_\_

## TYPE OF SUBMITTAL:

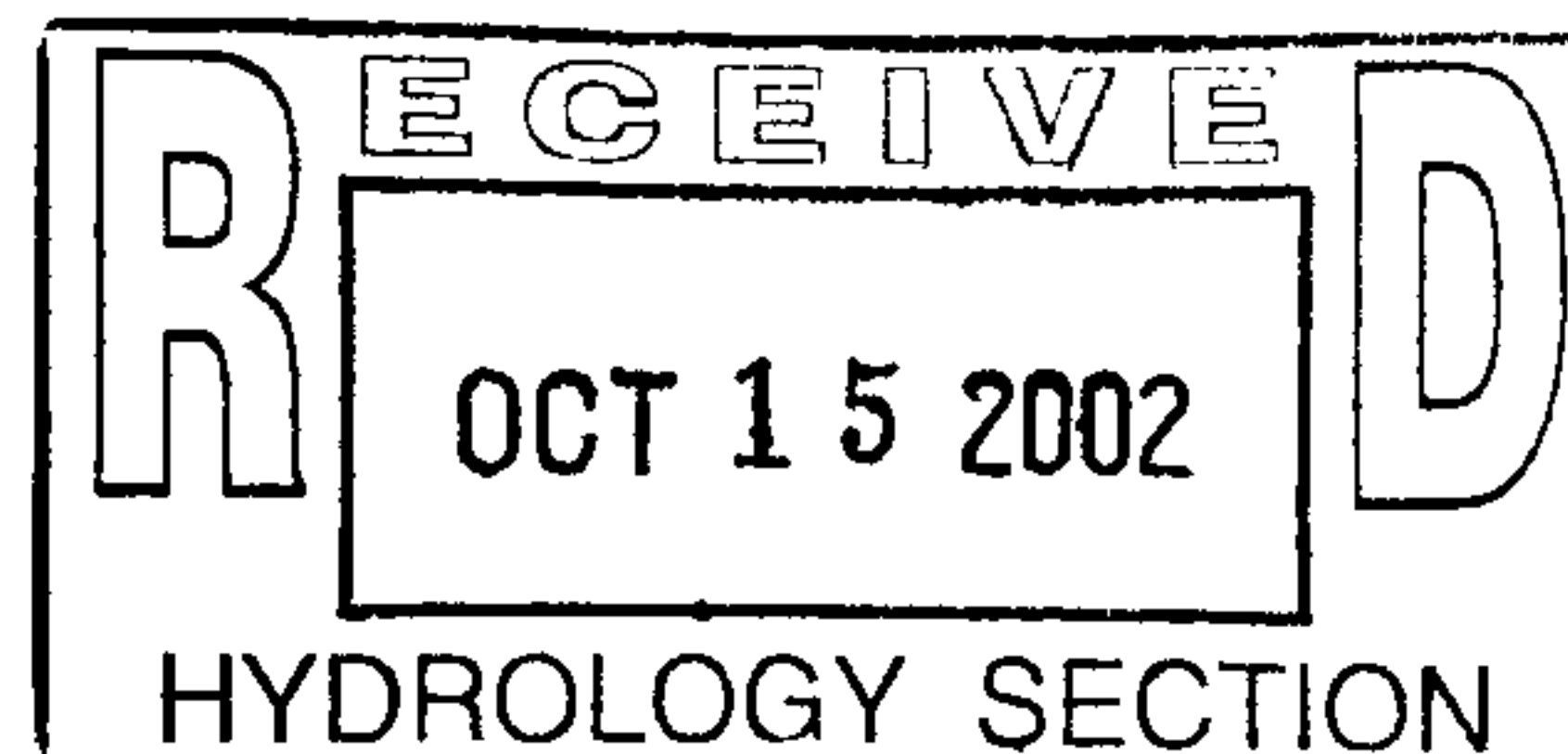
- ☒ DRAINAGE REPORT  
☒ DRAINAGE PLAN  
☐ CONCEPTUAL GRADING & DRAINAGE PLAN  
☐ GRADING PLAN  
☐ EROSION CONTROL PLAN  
☐ ENGINEER'S CERTIFICATION  
☐ OTHER

## PRE-DESIGN MEETING:

- ☐ YES  
☒ NO  
☐ COPY PROVIDED

## CHECK TYPE OF APPROVAL SOUGHT

- ☐ SKETCH PLAT APPROVAL  
☐ PRELIMINARY PLAT APPROVAL  
☐ S. DEV. PLAN FOR SUB'D APPROVAL  
☒ S. DEV. PLAN FOR BLDG. PERMIT APPROVAL  
☐ SECTOR PLAN APPROVAL  
☐ FINAL PLAT APPROVAL  
☐ FOUNDATION PERMIT APPROVAL  
☒ BUILDING PERMIT APPROVAL  
☐ CERTIFICATE OF OCCUPANCY APPROVAL  
☐ GRADING PERMIT APPROVAL  
☐ PAVING PERMIT APPROVAL  
☐ S.A.D. DRAINAGE REPORT  
☐ DRAINAGE REQUIREMENTS  
☐ SUBDIVISION CERTIFICATION  
☐ OTHER WORK ORDER (SPECIFY)

DATE SUBMITTED: 10/16/02BY: Mike Brewer

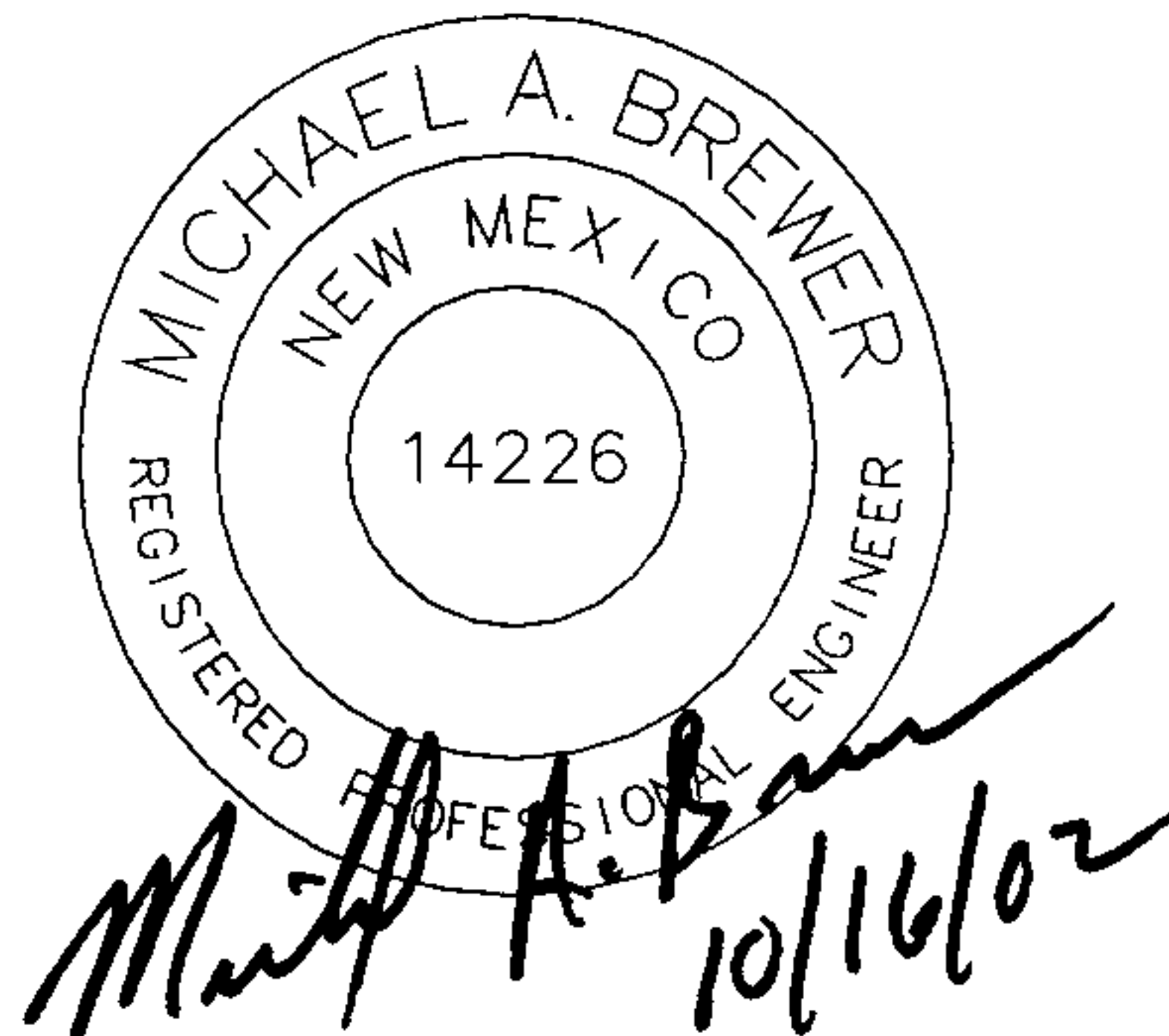


# CITY OF ALBUQUERQUE BERNALILLO COUNTY

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## NORTH I-25 RECLAMATION/REUSE SYSTEM NONPOTABLE SURFACE WATER RECLAMATION PROJECT

### DRAINAGE REPORT FOR EL OSO GRANDE RESERVOIR AND PUMP STATION SITE



The following items concerning the El Oso Grande Reservoir site grading and drainage improvements are contained herein:

- Vicinity Map
- FEMA Map
- Existing and Proposed Basin Maps
- Site Grading and Drainage Plan for Proposed Improvements at the El Oso Grande Reservoir and Pump Station Site
- Calculations



The site of the proposed improvements, as shown on the Site Vicinity Map (Attachment A), lies on the north side of the Bear Canyon Arroyo drainage easement and approximately 420 feet west of the centerline of Juan Tabo Blvd. Access to the proposed site will be provided via a gravel surfaced road connecting to the cul-de-sac formed by the junction of Sereno Drive and Osuna Road.

Improvements to the site include construction of a 1.15-million-gallon, below-grade nonpotable water storage reservoir, pump station, associated piping and appurtenances, site grading, gravel road, water and sewer connections, and landscaping.

The runoff calculations (see Attachment E) analyze the existing and fully developed conditions for the 100-year, 6-hour rainfall event for the proposed site development. The Rational Method was used to quantify the peak rate of discharge and the Soil Conservation Service (SCS) method was used to quantify the volume of runoff. Both methods were used in accordance with the City of Albuquerque *Development Process Manual* (DPM), section 22.2.

As shown on the FEMA Flood Boundary and Floodway Map, Panel 144 of 825, dated 4/2/2002 (Attachment B), the site lies within Zone X.

## Existing Conditions

The existing site and drainage boundary is shown on Attachment C and comprises an area of 3.76 acres and is not currently developed. Site runoff flows generally from East to West across the site.

Surface runoff from the existing site is currently collected in a depression at the southeast corner of the existing Ponderosa Reservoir Number Two property and conveyed offsite by 18" RCP to the Bear Canyon Arroyo.

## Proposed Improvements

Proposed improvements will consist of the construction of an 90-foot diameter, 1.15-million-gallon, below-grade, nonpotable water storage reservoir, pump station, associated underground utilities, site grading, and gravel access road as shown on the site grading and drainage plan (Attachment F). Underground utilities and appurtenances will include a 20-inch and 18-inch reuse water pipeline and emergency reservoir overflow piping.

The existing site will be regraded such that drainage on-site will be collected and conveyed to the existing 18" storm drain on the adjacent property which presently services the site. The fully developed site and drainage boundary are shown on Attachment D. Access to the proposed site will be provided by a 24-foot wide asphalt and gravel drive connected to Osuna Road.



## Storm Sewer Capacity

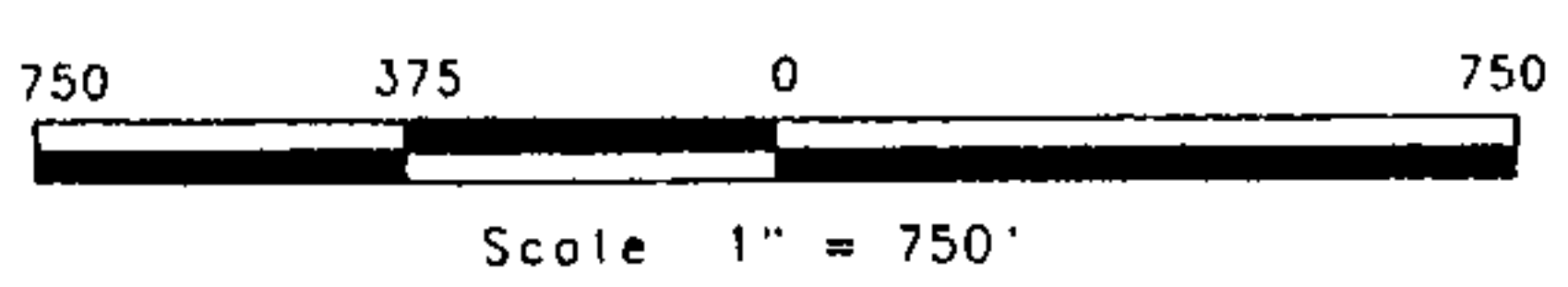
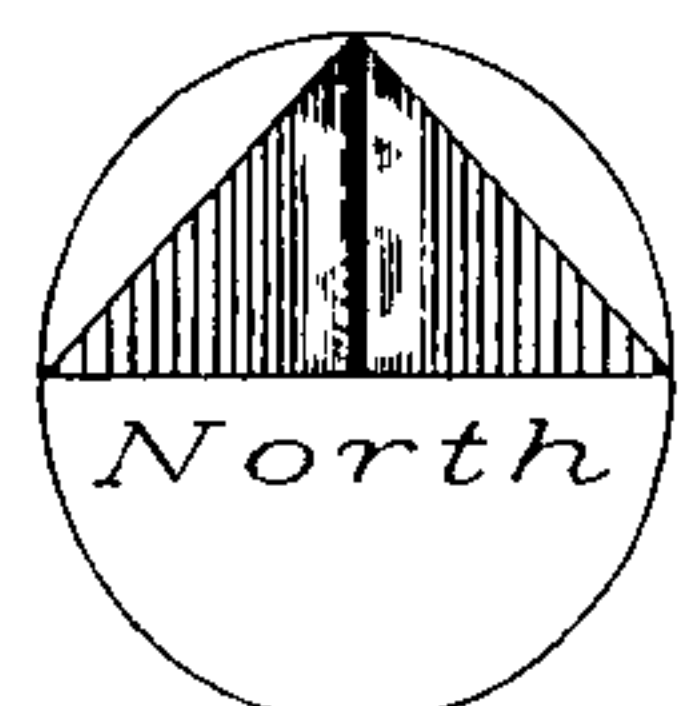
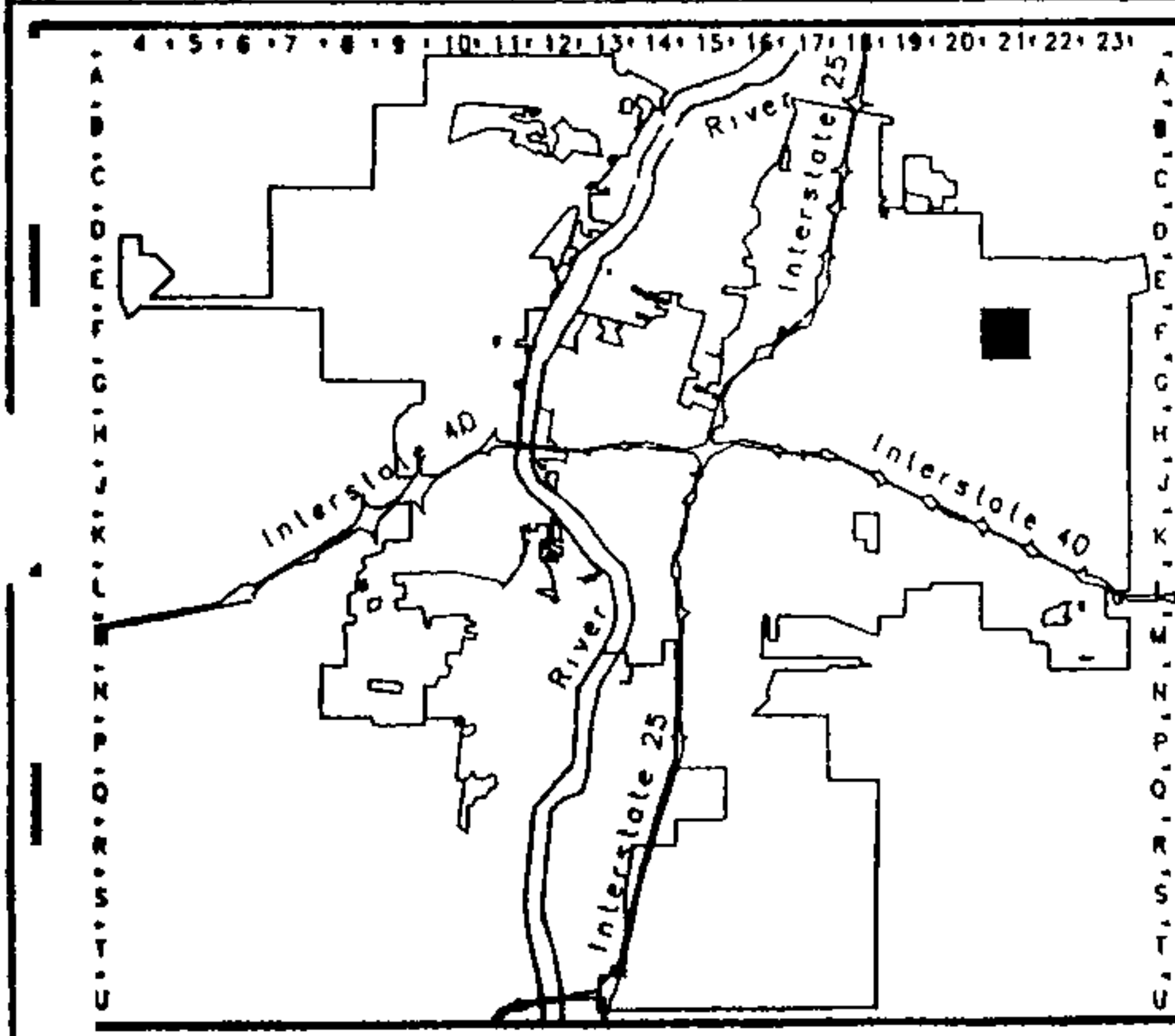
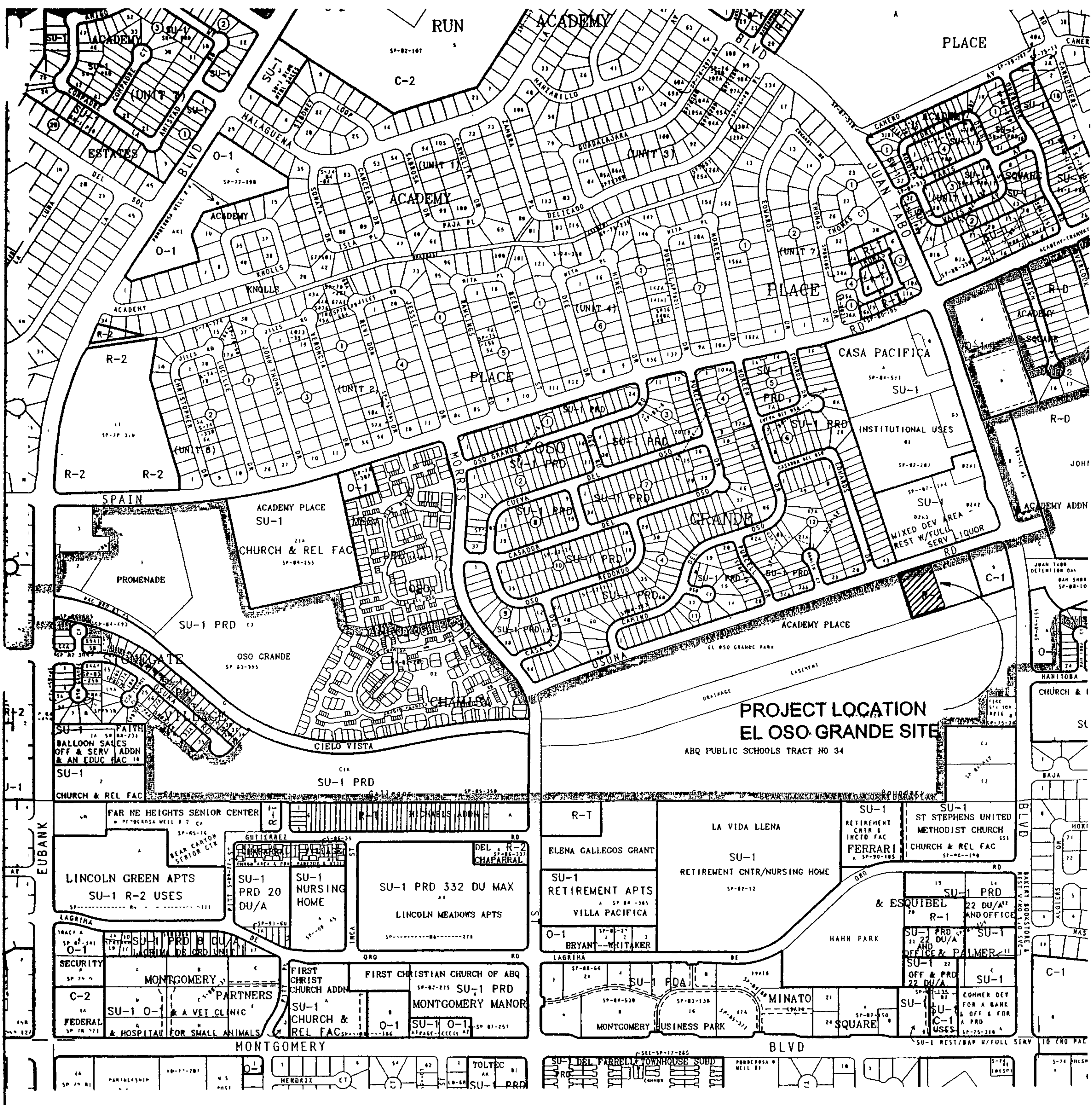
The storm water runoff, from the existing site ( $Q_{100} = 13.92$  cfs), is collected at the southeast corner of the Ponderosa Reservoir Number Two property and conveyed to Bear Canyon Arroyo by an 18" RCP pipe. The fully developed site conditions flow ( $Q_{100} = 15.36$  cfs) is proposed to be conveyed by the same drainage structure.

The new reservoir will have an emergency overflow capable of delivering 2,500 gpm, or 5.59 cfs to Bear Canyon Arroyo. The overflow will be piped to a dedicated manhole and an 18" RCP drainage structure will convey the flow to the arroyo. See Attachment F.

## Attachments

- A. Site Vicinity Map
- B. 100 Year Flood Plane in the Vicinity of the Proposed El Oso Grande Reservoir and Pump Station showing location of proposed development site
- C. Map showing existing drainage basin at the proposed development site
- D. Map showing fully developed drainage basin at the proposed development site
- E. Calculations on existing and proposed runoff flow and volume
- F. Site Grading and Drainage Plan for the Proposed Nonpotable Reservoir and Pump Station Site
- G. Hand calculations
- H. Site Landscaping Plan





**A**lbuquerque **G**eographic **I**nformation **S**ystem  
**City of Albuquerque**

© Planning Department July 07, 1993

**LEGAL DESCRIPTION**

T11N  
R4E  
SEC 33

**UNIFORM PROPERTY CODE**

1-021-061

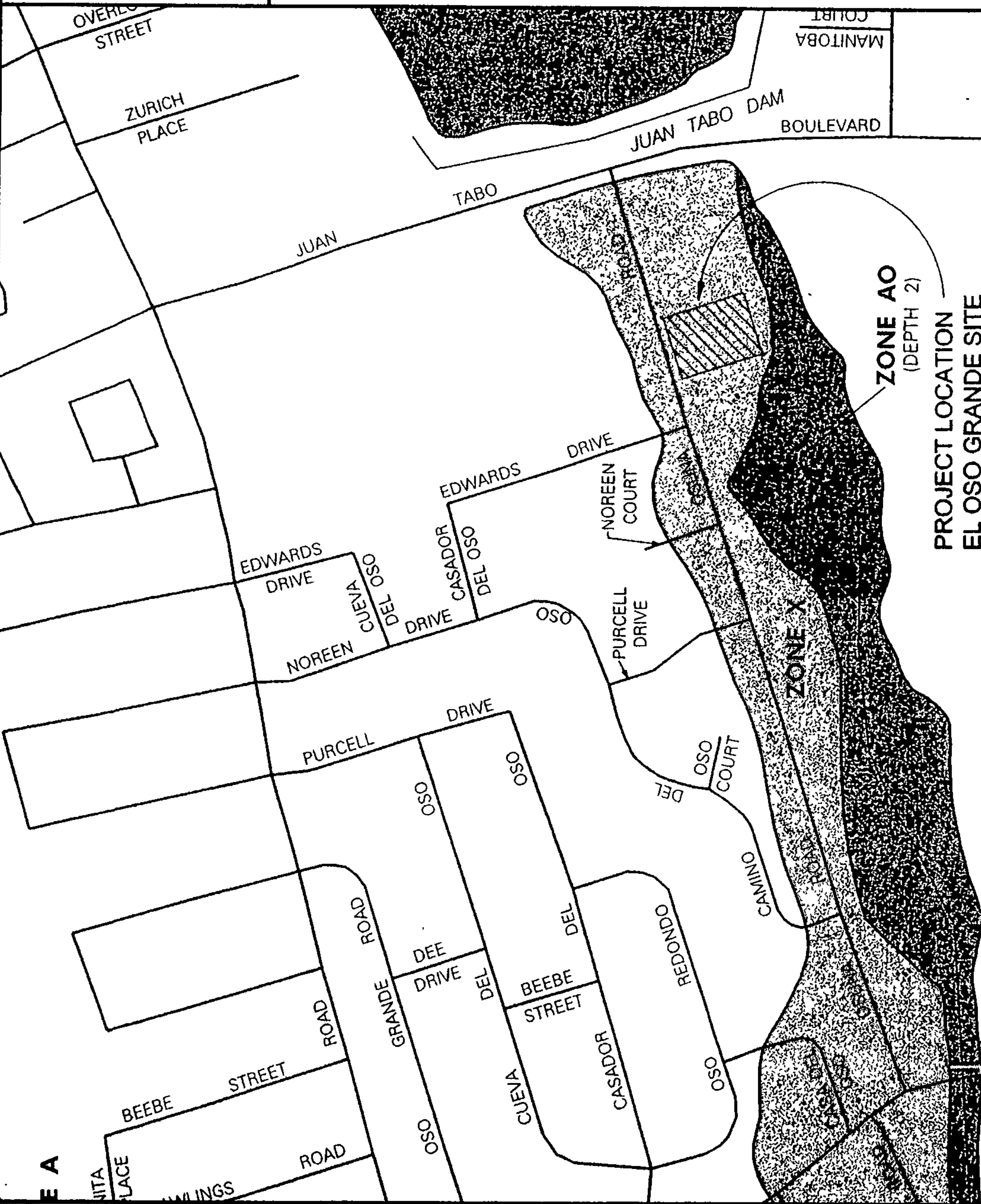
**F-21-Z**

**ATTACHMENT A**





APPROXIMATE SCALE IN FEET



NOTE: MAP AREA SHOWN ON THIS PANEL IS  
LOCATED WITHIN TOWNSHIP 11 NORTH, RANGE  
4 EAST AND TOWNSHIP 10 NORTH, RANGE 4 EAST.

NATIONAL FLOOD INSURANCE PROGRAM

**FIRM**  
**FLOOD INSURANCE RATE MAP**  
BERNALILLO COUNTY,  
NEW MEXICO AND  
INCORPORATED AREAS

PANEL 144 OF 825

(SEE MAP INDEX FOR PANELS NOT PRINTED)

CONTAINS:  
COMMUNITY

ALBUQUERQUE CITY OF

NUMBER PANEL SUFFIX  
350002 0144 E

MAP NUMBER  
35001C0144 E

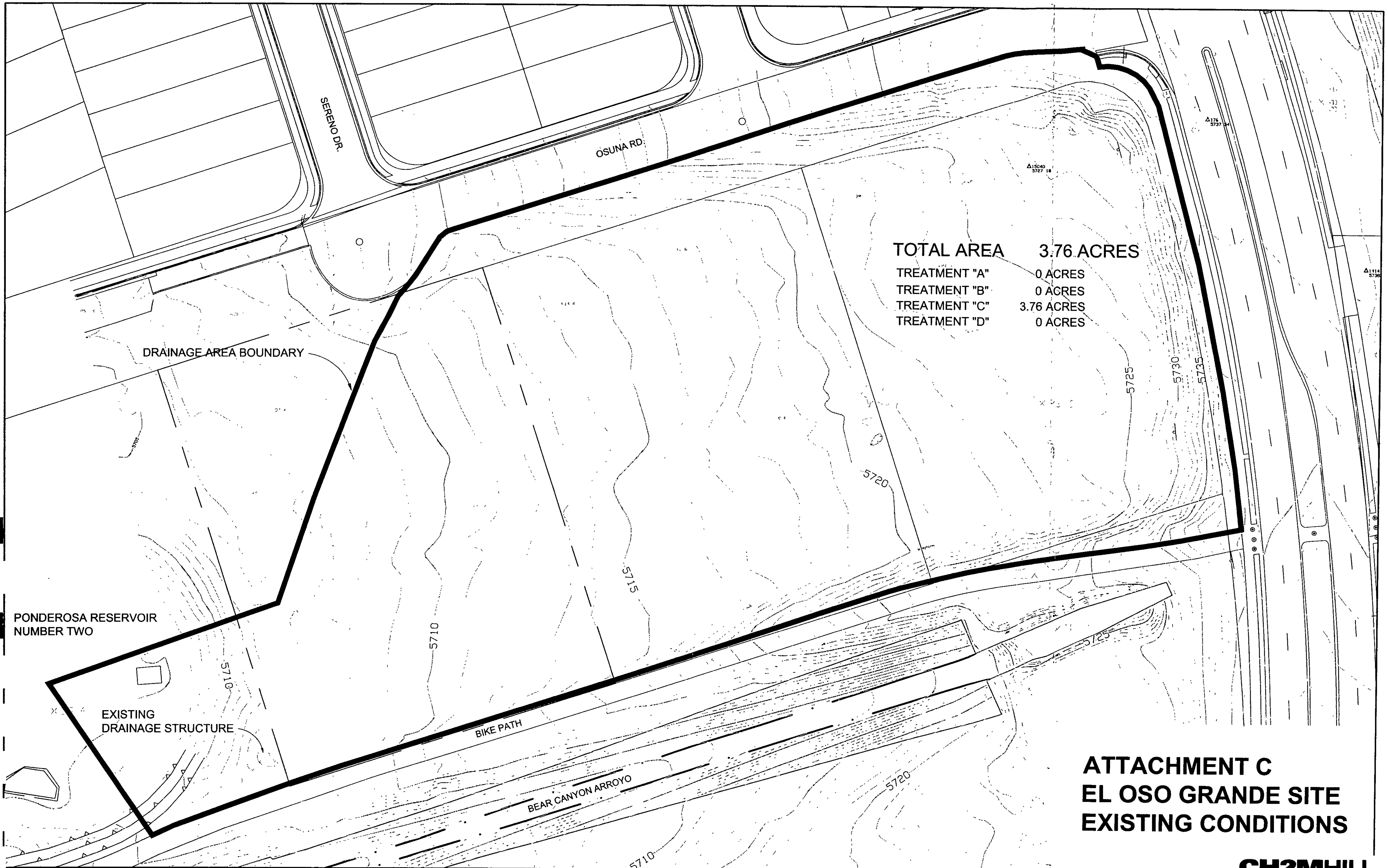
MAP REVISED:  
APRIL 2, 2002



Federal Emergency Management Agency

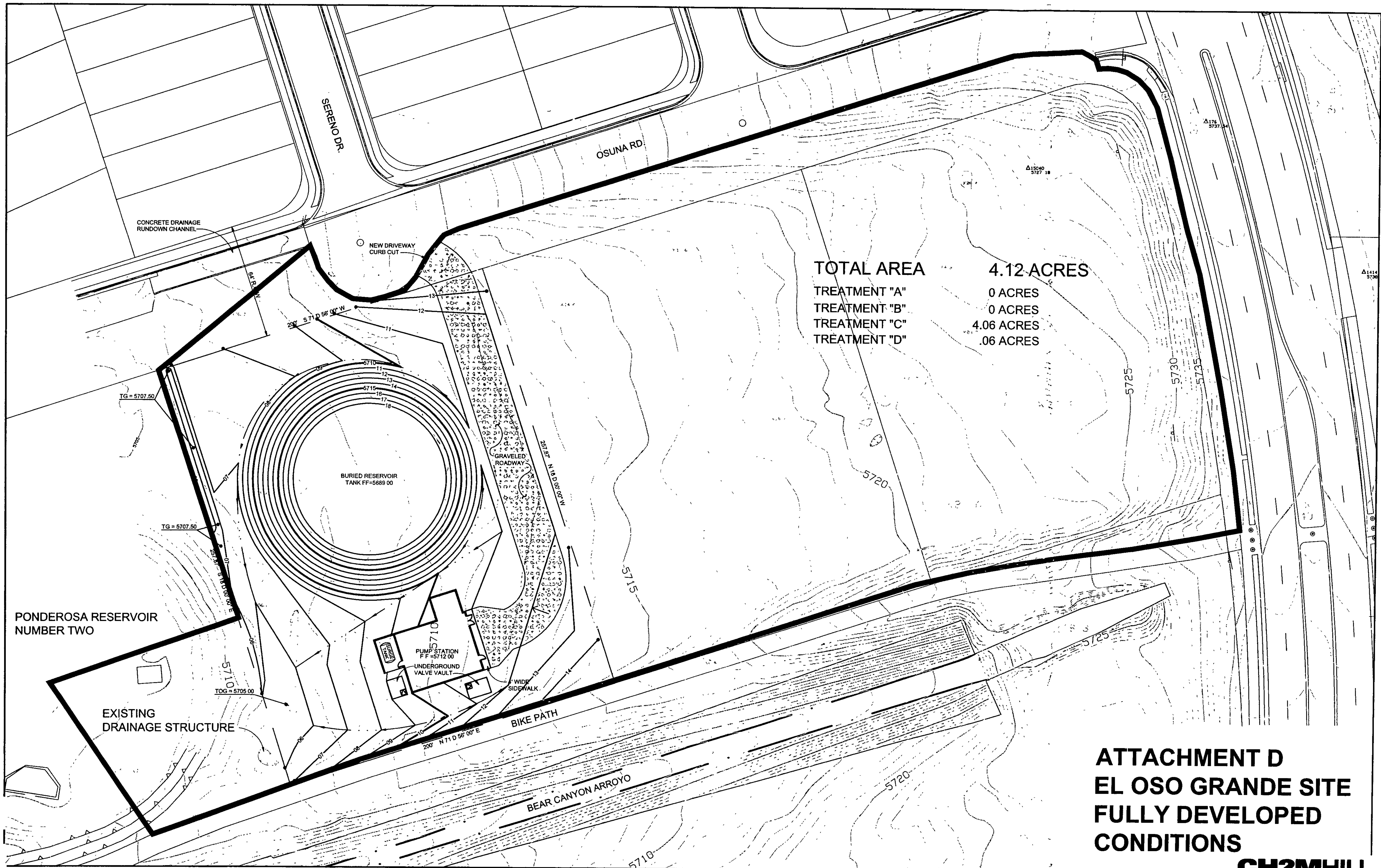
This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at [www.msc.fema.gov](http://www.msc.fema.gov)





**ATTACHMENT C  
EL OSO GRANDE SITE  
EXISTING CONDITIONS**





PONDEROSA RESERVOIR  
NUMBER TWO

EXISTING  
DRAINAGE STRUCTURE

BURIED RESERVOIR  
TANK FF=5689.00

PUMP STATION  
FF=5712.00

UNDERGROUND  
VALVE VAULT

BIKE PATH

BEAR CANYON ARROYO

| Treatment Area | Area (Acres) |
|----------------|--------------|
| TOTAL AREA     | 4.12 ACRES   |
| TREATMENT "A"  | 0 ACRES      |
| TREATMENT "B"  | 0 ACRES      |
| TREATMENT "C"  | 4.06 ACRES   |
| TREATMENT "D"  | .06 ACRES    |

**ATTACHMENT D**  
**EL OSO GRANDE SITE**  
**FULLY DEVELOPED**  
**CONDITIONS**



## ATTACHMENT E

The following calculations quantify the change in runoff flow and volumes due to the proposed site improvements.

### Ground Cover Information

From SCS Bernalillo County Soil Survey

Sheet 21 Soil Type for This Site is: **EmD – Embudo – gravelly fine sandy loam**

Hydrologic Soil Group: **B**

From DPM Section 22.2 Table A-1: Precipitation Zone for this site is **Zone 4** (East of Eubank, North of Interstate 40; and East of the East boundary of Range 4 East, South of Interstate 40)

Land Treatments Present:

- A** - Soil uncompacted by human activity with 0-10% slopes. Native grasses, weeds and shrubs in typical densities with minimal disturbance to grading, ground cover and infiltration capacity.
- B** - Irrigated lawns (slope < 10%), native grasses, weeds and shrubs, and soil uncompacted by human activity (slope 10%<20%)
- C** - Soil compacted by human activity. Minimal vegetation, vacant lots, unpaved parking/roads, gravel or rock on plastic.
- D** - Impervious areas, pavement and roofs.

### Time of Concentration

$T_c$  (Inches/Hour) per  
DPM Section 22.2 **= 0.2 hours = 12 minutes**

### 100 Year 6-Hour Depth (R)

“R” Depth (Inches) per  
DPM Section 22.2 Table A-2 **= 2.90 inches**

### Rational Method

Discharge (cfs):  $Q = CiA$

Where: **C = Runoff Coefficient** (from DPM Section 22.2 Table A-11)  
**i = From DPM Section 22.2 Table A-10 = 5.61 in/hr**  
**A = Area** (acres)

### SCS Method

Volume (cf):  $V = 3630 \times \Sigma(E \times A)$

Where **E = Excess Precipitation “E”**, from DPM Section 22.2, Table A-8.  
**A = Area** (acres)  
**3630 = conversion factor** (acre-feet to cubic feet)



## Existing Conditions

### Site Data

Area = 3.76 ac.

| Land Treatments                                | Area<br>(acres) | Runoff<br>Coefficient (C) | Excess<br>Precipitation (E) |
|------------------------------------------------|-----------------|---------------------------|-----------------------------|
| Undeveloped, Uncompacted<br>Area (Treatment A) | 0.00            | 0.39                      | 0.80                        |
| Landscaped Area (Treatment B)                  | 0.00            | 0.52                      | 1.08                        |
| Undeveloped Area<br>(Treatment C)              | 3.76            | 0.66                      | 1.46                        |
| Impervious Area (Treatment D)                  | 0.00            | 0.94                      | 2.64                        |

$$Q_{100} = \Sigma(CiA) = (0.66)(5.61)(3.76)$$

$$Q_{100} = 13.92 \text{ cfs}$$

Area impervious = 0.00 ac.: % impervious = 0.00%

$$V_{100} = 3630 \times \Sigma(E \times A) = 3630 [(1.46)(3.76)] = 19,927 \text{ cf}$$

## Fully Developed Conditions

### Site Data

Area = 4.12 ac.

| Land Treatments                                | Area<br>(acres) | Runoff<br>Coefficient (C) | Excess<br>Precipitation (E) |
|------------------------------------------------|-----------------|---------------------------|-----------------------------|
| Undeveloped, Uncompacted<br>Area (Treatment A) | 0.00            | 0.39                      | 0.80                        |
| Landscaped Area (Treatment B)                  | 0.00            | 0.52                      | 1.08                        |
| Undeveloped Area<br>(Treatment C)              | 4.05            | 0.66                      | 1.46                        |
| Impervious Area (Treatment D)                  | 0.07            | 0.94                      | 2.64                        |

$$Q_{100} = \Sigma(CiA) = (0.66)(5.61)(4.06) + (0.94)(5.61)(0.06)$$

$$Q_{100} = 15.36 \text{ cfs}$$

Area impervious = 0.06 ac.: % impervious = 1.70%

$$V_{100} = 3630 \times \Sigma(E \times A) = 3630 [(1.46)(4.06) + (2.64)(0.06)] = 22,135 \text{ cf}$$



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## Comparison

Change in  $Q_{100} = 15.36 \text{ cfs} - 13.92 \text{ cfs} = 1.44 \text{ cfs}$  (increase)

Change in  $V_{100} = 22,135 \text{ cf} - 19,927 \text{ cf} = 2,208 \text{ cf}$  (increase)



## TIME OF CONCENTRATION

$$t_c = (L_1/V_1 + L_2/V_2 + \dots + L_n/V_n) / 3600 \text{ SECONDS FOR } L < 4000'$$

$$V = 10 (K) \sqrt{S}$$

WHERE:  $K = 1$ 

FROM DPM SEC 22.2 TABLE B-1

$$S = (5734' - 5703.5') / 644' = .053$$

WHERE: 5734' = ELEV. NE CORNER

5703.5' = INV. ELEV. CATCHMENT PIPE

644' = LENGTH - NE CORNER - CATCHMENT

$$V = 10 (1) \sqrt{.053} = 2.3 \text{ FT/S}$$

$$t_c = (644' / (2.3 \text{ FT/S})) / 3600 \text{ S/HR} = .074 \text{ HR}$$

.074 HR &lt; 2 HR USE 2 HR

## TURN OFF FLOW AND VOLUME (PRESENT CONDITIONS)

$$Q = C I A$$

WHERE:  $C = .66$  TREATMENT C, ZONE 4

FROM DPM SEC 22.2 TABLE A-11

 $I = 5.61 \text{ IN/HR}$  FROM DPM SEC 22.2 TABLE A-10 $A = 3.76 \text{ ACRE}$ 

$$Q = .66 (5.61) (3.76) = 13.92 \text{ CFS}$$

$$V = 3630 (EXA)$$

WHERE:  $A = 3.76 \text{ ACRE}$  $E = 1.46 \text{ IN}$  FROM DPM SEC 22.2 TABLE A-4

$$V = 3630 (1.46 (3.76)) = 19,927 \text{ CF}$$



## RUNOFF FLOW AND VOLUME (FULLY DEVELOPED CONDITIONS)

$$Q = E(C \& A)$$

| WHERE: | LAND TREATMENT | AREA | C   | E    |
|--------|----------------|------|-----|------|
| "C"    | UNDEVELOPED    | 4.06 | .66 | 1.46 |
| "D"    | IMPERVIOUS     | .06  | .94 | 2.64 |

$$E = 5.61 \text{ IN/HR FROM DPM SEC 22.2 TABLE A-10}$$

$$Q = (.66)(5.61)(4.06) + (.94)(5.61)(.06)$$

$$Q = 15.03 + .316 = 15.35 \text{ CFS}$$

$$V = 3630 E(EA)$$

$$3630 [(1.46)(4.06) + (2.64)(.06)] = 22092 \text{ CF}$$

CHANGE IN Q:

$$15.35 \text{ CFS} - 13.92 \text{ CFS} = 1.44 \text{ CFS INCREASE}$$

CHANGE IN V:

$$22,135 \text{ CF} - 19,927 \text{ CF} = 2208 \text{ CF INCREASE}$$



CAPACITY OF EXISTING STORM DRAIN  
(CONDOROSA RESERVOIR)

$$D = 16"$$

$$\text{INVERT UP} = 5703.5'$$

$$\text{INVERT DOWN} = 5699.0'$$

$$L = 60'$$

$$S = (5703.5 - 5699.0) / 60' = .075$$

MANNING'S EQUATION - ASSUME FULL PIPE  
FLOW -

$$Q = \frac{K}{n} A R^{2/3} S^{1/2}$$

WHERE:

$$K = 1.49$$

$$n = .014 \text{ ROUGH CONCRETE PIPE}$$

$$A = (1.5)^2 \pi / 4 = 1.77 \text{ FT}^2$$

$$R = \frac{\text{AREA}}{\text{WET PERIM}} = \frac{1.77 \text{ FT}^2}{\pi (1.5 \text{ FT})} = \frac{1.77 \text{ FT}^2}{2.36 \text{ FT}}$$

$$= .75 \text{ FT}$$

$$S = .075$$

$$Q = \frac{1.49}{.014} (1.77) (.75)^{2/3} (.075)^{1/2} = 43 \text{ CFS}$$

$$Q (\text{FUTURE DEVELOPED}) = 15.36 \text{ CFS} \quad \underline{\underline{O.K.}}$$

THE EXISTING 16" RCP STORM DRAIN WILL HAVE  
AN EXCESS CAPACITY OF 27.64 CFS AFTER  
DEVELOPMENT.