RECEIVED DEC 0 3 1999

City of Albuquerque File

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

November 30, 1999

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

RE: DRAINAGE REPORT FOR ARSENIC REMOVAL DEMO FACILITY (H-9/D11)
RECEIVED OCT 21, 1999 FOR FINAL PLAT & SITE DEV PLAN
ENGINEER'S STAMP DATED 10/20/99

Dear Mr. Brewer:

Based on the information included in the submittal referenced above, City Hydrology accepts the Drainage Report for Final Plat and Site Development Plan. The following comments must be addressed before Building Permit or Work Order:

I am concerned that the 4" outlet pipe for the pond will clog. It appears that the pond can discharge an additional 1.17 cfs. I suggest that you try a 6" pipe instead. For orifices, I typically use a$_i$C factor of 0.6 instead of 0.82. Please indicate the required pond volume at the maximum water surface elevation (MWSEL). This volume must be checked as part of the Engineer's Certification.

If I can be of further assistance, You may contact me at 768-2727.

Sincerely,

John P. Curtin, P.E.
Project Manager, PWD/Hyd

c: Inspector

John Curtin
768-2727

THE CITY OF ALBUQUERQUE IS AN EQUAL OPPORTUNITY/REASONABLE ACCOMMODATION EMPLOYER

CH2MHILL *TRANSMITTAL*

TO: City of Albuquerque
P.O. Box 1293
Albuquerque, NM 87103

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

ATTN: John P. Curtin, P.E.
Project Manager, PWD/Hyd

DATE: October 21, 1999

RE: College Reservoir Site Development - Drainage Report - **Resubmittal**

PROJECT NUMBER: 149546.03.PD

WE ARE SENDING YOU:

♦ ATTACHED	UNDER SEPARATE COVER VIA	
SHOP DRAWINGS	DOCUMENTS	TRACINGS
PRINTS	SPECIFICATIONS	CATALOGS
COPY OF LETTER	OTHER:	

QUANTITY	DESCRIPTION
2	Resubmittal of Drainage Report for The City of Albuquerque College Reservoir Site Development
2	Cover letter describing revisions and responses to City of Albuquerque and Bernalillo County comments
2	Copy of City of Albuquerque (John P. Curtin, P.E.) comments on original submittal to City of Albuquerque
2	Copy of Bernalillo County (Brad Catanach, P.E.) comments from original submittal to Bernalillo County

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

REMARKS: John-Attached for your review is two copies of the revised drainage report for the proposed development of the College Reservoir Site. The proposed Improvements consist of the construction of an Arsenic Removal Demonstration Facility and Potable Water Pump Station. Since the date of the original submittal the College Reservoir site and adjacent Westland Development lands have been annexed into the City of Albuquerque.

COPY TO: John Stomp/City of Albuquerque-PWD
Mark Schmidt/City of Albuquerque-PWD
Art Stuart/City of Albuquerque-WUD
Victorio Deery/Leedshill Herkenhoff, Inc.
Project File

CH2M HILL, Inc.
6001 Indian School Rd., N.E.
Suite 350
Albuquerque, NM 87110 **Voice: 884-5600** **FAX: 883-7507**

COURIER TRANSMITTAL

sites southwest
5150 A SAN FRANCISCO NE
ALBUQUERQUE, NM 87109
PHONE: 505-822-8200
FAX: 505-822-8282
E-MAIL: mail@sites-sw.com
WEB: www.sites-sw.com

Date: *March 22, 2001*

☐DELIVERY
☒Courier ☐Mail
☐Fed Ex ☐UPS
☒PICK UP

TIME DUE:
☒Today A.M./P.M.
☐Tomorrow A.M./P.M.
☐

Item Qty. Description

To:

Company: CH2MHill
6001 Indian School Road NE
Suite 350

Phone: 884-5600

From: Barbara Herrington

Job Name: Job Number:

Subject:

Comments: Can you stop by CH2MHill and pick up the College Drainage report and return to Barbara Herrington @ SSW. Thanks.

Received by:

Date : 3/22 Time: 3:04

COURIER TRANSMITTAL

Date: *March 22, 2001*

☐DELIVERY
- ☒Courier ☐Mail
- ☐Fed Ex ☐UPS

☒PICK UP

TIME DUE:
- ☒Today A.M./P.M.
- ☐Tomorrow A.M./P.M.
- ☐

Item Qty. Description

sites southwest
5150 A SAN FRANCISCO NE
ALBUQUERQUE, NM 87109
PHONE: 505-822-8200
FAX: 505-822-8282
E-MAIL: mail@sites-sw.com
WEB: www.sites-sw.com

To:

Company: CH2MHill
6001 Indian School Road NE
Suite 350

Phone: 884-5600

From: Barbara Herrington

Job Name: Job Number:

Subject:

Comments: Can you stop by CH2MHill and pick up the College Drainage report and return to Barbara Herrington @ SSW. Thanks.

Received by: _____

Date : _____ Time: _____

ZONE ATLAS/DRNG. FILE #: H-9/D011

DRB #: _____ EPC#: CSU99-11 WORK ORDER #: _____

LEGAL DESCRIPTION: East 1/2 of NW1/4, Section 9, T10N, R2E

CITY ADDRESS: Approximately 3/4 mile West of Unser Blvd. along the extension of 98th Street

ENGINEERING FIRM: CH2M HILL, INC. CONTACT: Michael Brewer

ADDRESS: 6001 Indian School Rd, NE, Suite 350 Albuquerque, NM 87110 PHONE: 505/884-5600

OWNER: City of Albuquerque-PWD CONTACT: John M. Stomp, III

ADDRESS: P.O. Box 1293, Albuquerque, NM 87103 PHONE: 505/768-2562

ARCHITECT: _____ CONTACT: _____

ADDRESS: _____ PHONE: _____

SURVEYOR: Bohannan Huston, Inc. CONTACT: Dwain Weaver

ADDRESS: Courtyard One 7500 Jefferson, NE Albuquerque, NM 87109 PHONE: 505/823-1000

CONTRACTOR: _____ CONTACT: _____

ADDRESS: _____ PHONE: _____

TYPE OF SUBMITTAL:

- X DRAINAGE REPORT
- X DRAINAGE PLAN
- X CONCEPTUAL GRADING & DRAINAGE PLAN
- ___ GRADING PLAN
- ___ EROSION CONTROL PLAN
- ___ ENGINEER'S CERTIFICATION
- ___ OTHER _____

PRE-DESIGN MEETING:

- ___ YES
- X NO
- ___ COPY PROVIDED

CHECK TYPE OF APPROVAL SOUGHT:

- ___ SKETCH PLAT APPROVAL
- ___ PRELIMINARY PLAT APPROVAL
- ___ S. DEV. PLAN FOR SUB'D APPROVAL
- X S. DEV PLAN FOR BLDG. PERMIT APPROVAL
- ___ SECTOR PLAN APPROVAL
- X 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
- X OTHER DRB Approval/Signoff (SPECIFY)

DATE SUBMITTED: 10/21/99

BY: Michael A. Brewer

Revised 02/98

CDRA Case No. SRP5-99-36

CH2M HILL
6001 Indian School Road NE
Suite 350
Albuquerque, NM
87110-4140 U.S.A.
Tel 505.884.5600
Fax 505.883.7507

CH2MHILL

October 21, 1999

149546.03.PD

John P. Curtin, P.E.
City of Albuquerque
Public Works Department/Hydrology
P.O. Box 1293
Albuquerque, NM 87103

Subject: Drainage Report for Arsenic Removal Demonstration Facility,
College Reservoir (H-9/D011)

Dear John:

Attached is the revised Drainage Report (Resubmittal) for the City of Albuquerque College Reservoir Site Development. The original drainage report was submitted on July 9, 1999 for preliminary/final plat and site development plan approval. At the time of the original submittal the College Reservoir Site and adjacent lands of Westland Development, Inc. were outside the City limits and being proposed for annexation. Plat approval was under the jurisdiction of the Bernalillo County Development Review Authority and the Site Development Plan Approval under the jurisdiction of the Extraterritorial Land Use Commission. In consideration of the Authoritative jurisdiction, a subsequent submittal of the Drainage Report was made to Bernalillo County, incorporating the comments described in your letter dated August 5, 1999 (copy attached). Brad Catanach, P.E. Bernalillo County Public Works Department, reviewed the drainage submittal and provided additional comments (copy attached).

Since receipt of Mr. Catanach's comments, the annexation of the College Reservoir Site has been completed, and jurisdiction/authority now falls under the City of Albuquerque. The attached Drainage Report for the Arsenic Removal Demonstration Facility and College Pump Station has been revised to address all comments received from both the City of Albuquerque and Bernalillo County reviews. The drainage report has been revised to discuss and compare the preexisting conditions prior to the initial site development, the present site conditions as currently exists, and the proposed site development. The increased storm water runoff attributable to the existing and proposed site development will be collected in an on-site detention basin and released at a controlled rate to the Ladera Arroyo. The total discharge from the site is expected to be less than the estimated surface runoff, which occurred from the pre-1981 undeveloped natural site conditions. The detention pond has been designed to store the total runoff volume from the 100-year 6-hour storm event and to drain completely in approximately 4.25 hours at a maximum rate of 1.2-

cfs. The detention basin overflow structure is designed to convey the total volume of storm water, in excess of the 100-year 6-hour storm, directly to the Ladera Arroyo. To prevent overtopping of the detention basin, the overflow structure weir elevation and length has been designed to pass the total volume of storm water resulting from the 6-hour local storm probable maximum precipitation (PMP), taken from the City of Albuquerque DPM Section 22.2.

Sincerely,

CH2M HILL

Michael Brewer, P.E.
Project Engineer

c: John Stomp/City of Albuquerque-PWD
Mark Schmidt/City of Albuquerque-PWD
Art Stuart/City of Albuquerque-WUD
Victorio Deery/Leedshill Herkenhoff, Inc.
Project File

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

August 5, 1999

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

RE: DRAINAGE REPORT FOR ARSENIC REMOVAL DEMO FACILITY, COLLEGE RESERVOIR (H-9/D011); RECEIVED JULY 9,1999 FOR PRELIMINARY & FINAL PLAT, SITE DEV PLAN; ENGINEER'S STAMP DATED 7/8/99

Dear Mr. Brewer:

Based on the information included in the submittal referenced above, City Hydrology accepts the concept for Preliminary Plat and Site Development Plan. The following comments must be addressed before Building Permit, Work Order or Final Plat:

Retention ponds must be designed to store the 100 year, 10 day storm volume per the Mayor's Emergency Rule published 5-14-91 (attached). Indicate the location and details of the emergency spillway. It appears that the retention pond could be converted into a detention pond by using the washwater line as an outlet. It is recommended that the total discharge from the site be limited to 12.3 cfs. Add erosion control notes to the Grading & Drainage Plan.

If I can be of further assistance, You may contact me at 768-2727.

Sincerely,

John P. Curtin, P.E.
Project Manager, PWD/Hyd

c: Inspector

THE CITY OF ALBUQUERQUE IS AN EQUAL OPPORTUNITY/REASONABLE ACCOMMODATION EMPLOYER

CITY OF ALBUQUERQUE

ALBUQUERQUE, NEW MEXICO

INTER-OFFICE CORRESPONDENCE REF. NO._____

February 28, 1991

TO: Louis E. Saavedra, Mayor

FROM: Robert E. Gurule, Director, Public Works Department REG

SUBJECT: NOTICE OF EMERGENCY RULE/RETENTION PONDING

At the request of Mr. Kevin Murphy, the Hydrology Division has prepared a Notice Of Emergency Rule for your consideration. The purpose of this Emergency Rule is to formalize the City's policy.

Under the City's policy, retention ponding is allowed on a temporary basis only. We have found that the permanent retention ponds, a policy of the 1970's, became mosquito breeding areas and quickly failed as they became clogged with silt. We remedied this by allowing retention ponding as a temporary solution until proper drainage facilities were installed.

The DPM Steering Committee has created a drainage sub-committee to look into the retention pond question. The committee consists of private and public engineers and one professor from the university. The members are:

Dr. Richard Heggen, Civil Engineering Professor, UNM
Chuck Easterling, P.E., Easterling & Associates, Inc.
Brian Burnett, P.E., Bohannan-Huston, Inc.
Dwayne Sheppard, P.E., Public Works Department
Bob Foglesong, P.E., Bernalillo County Public Works
Cliff E. Anderson, P.E., AMAFCA
Fred Aguirre, P.E., Public Works Department

With the issuance of this Emergency Rule, we can approve plans which require retention on a temporary basis without creating a burden on the development community or the City. This rule will serve until the drainage sub-committee recommendations are adopted by the DPM Steering Committee.

Concur:

Walter H. Nickerson, Jr., P.E.

Concur:

Daniel W. Hogan 3/1/91

Daniel W. Hogan, P.E.

xc: Kevin Murphy

FJA:REG/bsj

pursuant to Article XX, Chapter 7 of the Revised Ordinances of Albuquerque, 1974:

I, Louis E. Saavedra, Mayor of the City of Albuquerque, have determined that there are urgent and compelling reasons to include certain rules in the Development Process Manual relating to the Minimum Standards for the design of Subdivisions.

This modification of rules is necessary to preclude possible inaccuracies and inconsistencies in the application of certain design criteria for the design of drainage management and flood control systems within the platting and planning jurisdiction of the City of Albuquerque.

I, therefore, declare that the following modifications to the Development Process Manual of the City of Albuquerque shall become effective immediately:

Volume II, of the Development Process Manual shall be modified as follows:

Chapter 22, page 7. Expand part C.3. to include the following:

All Detention ponds must be evacuated in 24 hours or less. Ponds that take more than six hours to drain will be designed for a 24 hour storm. Credit for evacuation by means of percolation will not be taken into account.

Retention ponds will only be permitted on a temporary basis and will only be allowed on a case by case basis as determined by the City Engineer. The criteria for temporary ponds may include but are not limited to the following:

Design of the pond volume will be based on a 100 year 10 day storm with no percolation credit for volume reduction;

The inclusion of an emergency spillway with the pond to carry the 100 year design flow which enters the pond;

The acceptance by the owner of maintenance responsibilities and legal liabilities of the pond;

Approval by the State Engineer if the pond comes under that agent's jurisdiction; and,

Fencing as required by the City Engineer.

Additional modifications may be incorporated into the next periodic update of the Development Process Manual.

For further information regarding this matter, contact the City Engineer at telephone number 768-2650 or by mail at City/County Government Center, One Civic Plaza, Public Works Department, Engineering Group, 3rd Floor, 87103.

Louis E. Saavedra, Mayor

TO BE PUBLISHED IN THE ALBUQUERQUE JOURNAL AND ALBUQUERQUE TRIBUNE ON 5-14-91.
date

NOTICE OF EMERGENCY RULE

Pursuant to Article XI, Chapter 7, of the Revised Ordinances of Albuquerque, 1974:

I, Louis E. Saavedra, Mayor of the City of Albuquerque have determined that there are urgent and compelling reasons to include certain rules in the Development Process Manual relating to the Minimum Standards for the design of Subdivisions

This modification of rules is necessary to preclude possible inaccuracies and inconsistencies in the application of certain design criteria for the design of drainage management and flood control sysems within the platting and planning jurisdiction of the City of Albuquerque

I therefore declare that the following modifications to the Development Process Manual of the City of Albuquerque shall become effective immediately:

Volume II, of the Development Process Manual shall be modified as follows:

Chapter 22, page 7 expand part C.3 to include the following:

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The inclusion of an emergency spillway with the pond to carry the 100 year design flow which enters the pond;

The acceptance of the owner of maintenance responsibilities and legal liabilities of the pond;

Approval by the State Engineer if the pond comes under that agent's jurisdiction; and

Fencing as required by the City Engineer

Additional modifications may be incorporated into the next periodic update of the Development Process Manual

For further information regarding this matter contact the City Engineer at telephone number 768-2650 or by mail, at City/County Government Center, One Civic Plza, Public Works Department, Engineering Group, 3rd Floor, 87103

s/Louis E. Saavedra, Mayor

Any person having any questions or comments regarding this rule change can call the City Engineer at 768-2650. This rule change will become effective 30 days after its publication in the newspaper

Journal: May 14, 1991
Tribune: May 14, 1991

BOARD OF COUNTY COMMISSIONERS
TOM RUTHERFORD, CHAIR
DISTRICT 3
BARBARA J. SEWARD, VICE CHAIR
DISTRICT 4
KEN SANCHEZ, MEMBER
DISTRICT 1
STEVE D. GALLEGOS, MEMBER
DISTRICT 2
LES HOUSTON, MEMBER
DISTRICT 5
JUAN R. VIGIL, COUNTY MANAGER

County of Bernalillo

State of New Mexico

MARK J. CARRILLO, ASSESSOR
JUDY D. WOODWARD, CLERK
IRA ROBINSON, PROBATE JUDGE
JOE BOWDICH, SHERIFF
ORLANDO VIGIL, TREASURER

2400 BROADWAY, S.E.
ALBUQUERQUE, NEW MEXICO 87102
PUBLIC WORKS (505) 848-1500

Date: 17-SEP-99

Subject: GRADING AND DRAINAGE COMMENTS

Case No: PWDN 990169

Zone Map No: H-9

Street Address: WEST OF UNSER BLVD

Legal Description: E ½ OF NW ¼ SEC 9 T10N R2E

Name of Applicant: CH2M HILL

Dear Applicant:

Department will require TWO WEEKS for review and comment of submittal and **resubmittals, and ONE WEEK for final review and plat sign-off.** Major submittals may require more than two weeks for review and comment.
The issuance of a permit or a review or approval of plan specifications, computations, and shop drawings shall not be interpreted to be a permit for or an approval of any variance or violation of any of the provisions of any county or State codes, ordinances, standards, or policies. Nor shall such issuance of a permit or approval of plans, specifications, computations, and shop drawings prevent any authorized County representative or County inspector from thereafter requiring the corrections of errors in said plans, specifications, computations, or shop drawings or from stopping construction operations which are being carried on thereunder when in violation of any County or state codes, ordinances, standards, or policies. Review of construction plans, specifications, computations, and shop drawings is only for general conformance with the design concept of the project and general compliance with the plans and specifications and shall not be construed as relieving the Contractor, Land Divider, Subdivider, Engineer/Surveyor, or applicant of the full responsibility for: providing materials, equipment, and work required by the contract; the proper fitting and construction for the work; the accuracy and completeness of the submittal; selecting fabrication processes and techniques of construction; and performing the work in a safe manner.

REV 4-22-91 BR

COUNTY OF BERNALILLO

APPLICATION FOR CASE REVIEW

Please complete pages one and two of this application for review of your case. **Submit THREE bluelines of plat, drawings, or information with case submittals and THREE bluelines of plat, drawings, or information along with the original mylar for final sign-off applications. Submit a County Zone Atlas Map with subject property marked on the map.** If a Grading and Drainage plan is not included with a land division, replat, or conceptual plan, please submit on 8.5"x11" photocopy of a USGS quad map with the subject property superimposed.

NOTE: INCOMPLETE APPLICATIONS WILL BE RETURNED WITHOUT REVIEW.

1. APPLICANT INFORMATION:

a. Applicant is (check one):

_X_ OWNER _____ SURVEYOR _____ AGENT
_____ ENGINEER _X_ DRAINAGE ENGINEER

b. Date of this application:_____

c. Signature of applicant:

(print)_____(sign)_____

OWNER: MARK SCHMIDT PHONE:
PUBLIC WORKS
CITY OF ALBUQUERQUE
PO BOX 1293
ALBUQUERQUE NM 87103

AGENT: CH2M HILL PHONE: 884-5600
6001 INDIAN SCHOOL RD NE #350
ALBUQUERQUE NM 87110

2. TYPE OF SUBMITTAL (check one):

_____ REPLAT
_____ LAND DIVISION (MINOR SUBDIVISION)
_____ MAJOR SUBDIVISION
_____ CONSTRUCTION DRAWINGS
_X_ GRADING/DRAINAGE PLAN
_____ AS-CONSTRUCTED GRADING/DRAINAGE PLAN
_____ VARIANCE REQUEST
_____ TRAFFIC IMPACT ANALYSIS/TRAFFIC STUDY
_____ INFRASTRUCTURE LIST/DESIGN REVIEW FEE

County of Bernalillo

Your : ✓ submittal of drainage information
____ resubmittal of drainage information

TO BE FILLED OUT BY COUNTY PUBLIC WORKS DIVISION ONLY

is: ____ approved.
____ approved with comments/conditions.
✓ disapproved.
____ deferred to County Floodplain Administrator.

Case review comments are:

✓ attached.
____ not attached.
____ not attached. See remarks below.

Resubmittal is:

✓ not required.
____ required. When resubmitting, please use Resubmittal Form.

Please submit:

✓ grading/drainage plan with revisions.
____ as-constructed grading/drainage plan.
____ other: _____

It is required that:

____ Bernalillo County Public Works Division inspects improvements prior to final sign-off of plat.
____ Bernalillo County Public Works Division signature line be placed on plat.

Remarks: _____

Brad Catanach 9/9/99
Brad Catanach, P.E.
Drainage Engineer
Bernalillo County Public Works Division

Comments
Development Review Engineer
AMAFCA

cc:

____ Owner: C.O.A.
____ Agent: CH2M Hill
____ Case File PWDN-990169
____ Susan Calongne, County Floodplain Administrator, COA
____ Molzen-Corbin & Associates
____ Other: _____

County of Bernalillo
Case Comments Report

Permit: PWDN-990169

Department: PDEV

Activity: (PWDRAN) PW GRADING & DRAINAGE PLAN REVIEW

Action: (PWDRAN) REVIEW GRADING & DRAINAGE COMMENTS

1. Note Date: 09-SEP-1999

Description:

Comments: 1. Existing conditions for this site should be considered 100% land treatment A.

2. Proposed basin 1 shows 1.1 acre being left undisturbed, the plan shows the entire basin being graded. Basin 1 should be reflected as land treatments C and D.

3. The allowable discharge for Basins 1 and 2 is for 100% treatment A (4.21 and 3.62 cfs respectively), Basin 2 is discharging above the allowable limit.

4. Provide an easement for the 24 inch outfall pipe to the Ladera Arroyo. Provide a detail of the orifice plate for the 24 inch pipe with supporting calculations. Also, provide a detail of the outlet structure in the Ladera Arroyo.

5. Provide pond capacity calculations; if the detention pond is sized for a 6-hour storm then it must drain in 6 hours (a stage storage pond routing calculation would be useful with the next submittal). The proposed grading for basin 1 does not concentrate the flows to the rundown.

6. Basin 1 is not graded to reflect all of the flows being directed towards the detention pond.

7. Show proposed grading for the future 5 mg reservoir.

8. Provide the standard engineer's site inspection statement in regards to a site visit by the engineer and the topography being accurate.

9. Provide a FEMA map showing the site location in regards to mapped floodplains.

AMAFCA COMMENTS:

10. What is the flow velocity for existing and proposed conditions.

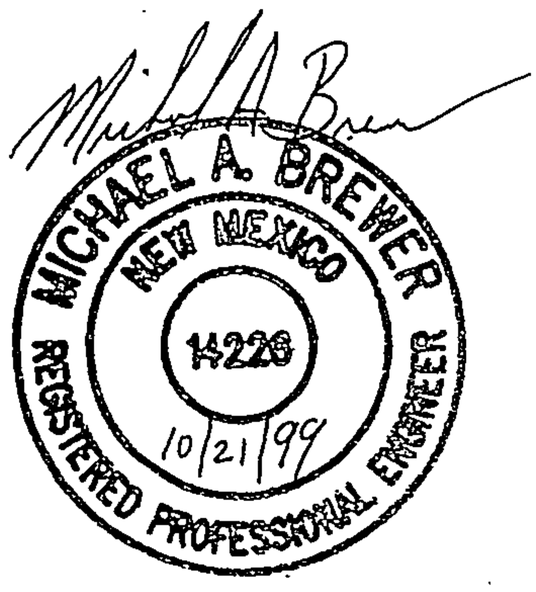
11. It is not clear if the outfall structure to the Ladera Arroyo is proposed or existing.

Date: 17-SEP-1999

CITY OF ALBUQUERQUE
BERNALILLO COUNTY

ARSENIC REMOVAL DEMONSTRATION FACILITY AND COLLEGE PUMP STATION

DRAINAGE REPORT
FOR COLLEGE RESERVOIR SITE



The following items concerning the College Reservoir site grading and drainage improvements are contained herein:

- Vicinity Map
- 100-Year Flood Plane Locations
- Site Grading and Drainage Plan for the Existing and Proposed Improvements at the College Reservoir Site
- Storm Water Runoff Calculations
- Proposed landscaping Plan

The location of the proposed improvements, Arsenic Removal Demonstration Facility and College Pump Station, are to the north and east of the existing College Reservoir. The

College Reservoir site is located west of Unser Blvd. and north of 98th Street, as shown on the Site Vicinity Map (Attachment A). Access to the site is via an existing utility and access easement from 98th Street. The proposed improvements to the site include the construction of an Arsenic Removal Demonstration Facility, Potable Water Pumping Station, associated piping and appurtenances, site grading, storm drainage modifications, and landscaping.

The runoff calculations (see Attachment C) analyze the preexisting, existing and fully developed conditions for the 100-year, 6-hour rainfall event for the entire College Reservoir site. 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 100-Year Flood Plane Map (Attachment B), this site does not lie within a designated flood hazard area. Due to the fact that this property is located within and adjacent to existing undeveloped lands it would not be expected to contribute runoff to an existing flooding problem. Runoff flows, from the developed areas of the site, will be collected and diverted to a new storm water detention pond constructed at the northeast corner of the site. The proposed site hydrology and surface runoff volumes are anticipated to generally maintain the historic status quo for the site drainage and surface runoff.

PreExisting Site Conditions

The College site is situated within the East ½ of the NW ¼, Section 9, T10N, R2,E and comprises an area of approximately 6.07 acres. The preexisting site topography, prior to the existing site developments, is shown in Attachment D. Runoff from the site historically drained via sheetflow from southwest to northeast into the Ladera Arroyo. The preexisting site hydrology and surface configuration contributed an estimated runoff of 7.70-cfs to the Ladera Arroyo.

Existing Conditions

The existing College Reservoir site comprises an area of approximately 6.07 acres. Currently, the site is partially developed with the construction of a 5.0 million-gallon, above ground steel reservoir, well pump building and paved site access road. The existing development divides the site into two drainage basins, defined by the developed improvements and the existing topography, as shown on attachment E. Drainage Basin 1 covers an area of approximately 2.49 acres and includes the developed portions of the site. Surface runoff, from Basin 1, is routed to an existing on-site storm water retention pond. Basin 2 encompasses the undeveloped portions of the site, totaling an area of approximately 3.58 acres. Surface runoff, from Basin 2, flows generally to the north and east across the adjacent undeveloped land and into the existing Ladera Arroyo. The existing site hydrology and surface configuration contributes an estimated runoff of 5.99-cfs to the Ladera Arroyo. 6.32-cfs is retained on the site. The existing reservoir overflow and well washwater are piped to a concrete outlet structure and discharged directly into the Ladera Arroyo. Details of the existing concrete outfall structure are shown in the Appendix.

Proposed Improvements

The proposed improvements will consist of the construction of an Arsenic Removal Demonstration Facility (8600 S.F.), a new Water Pumping Facility (2950 S.F.), a future 5.0 million gallon, above ground steel reservoir, associated underground utilities and appurtenances, site grading, and landscaping, as shown on Attachment F.

The College Reservoir site will be regraded such that all surface runoff, originating from the developed areas of the site (Basin 1 totaling 3.26 acres), will be collected and conveyed to a new storm water detention pond at the northeast corner of the site. The new storm water detention pond is designed to collect and temporarily hold the total runoff volume from Basin 1, for the 100-year 6-hour storm event. Surface runoff from the undeveloped portion of the site (Basin 2 totaling 2.81 acres) will continue to flow to the north and east across the adjacent undeveloped land and into the existing Ladera Arroyo. The proposed site hydrology and surface configuration would contribute a maximum runoff of 6.53-cfs to the Ladera Arroyo.

The existing and future reservoir overflows and well washwater will continue to be piped to the concrete outlet structure and discharged directly into the Ladera Arroyo.

Storm Water Detention Pond

A new Storm Water Detention Pond will be constructed at the northeast corner of the site and sized to contain the full 100-year, 6-hour rainfall volume, 15,282 ft^3. The pond will be designed and constructed to provide one-foot 3-inches of freeboard (6,822ft^3 excess capacity) along with an emergency overflow structure to convey storm water volumes in excess of the 100-year, 6-hour event, directly to the Ladera Arroyo. The emergency overflow structure, as shown in Attachment H, will include an inlet port located at the bottom of pond elevation to provide a controlled release of the storm water volume collected from Basin 1. Runoff collected in the new storm water detention pond will be released to the Ladera Arroyo at a controlled rate of approximately 1.2-cfs, which will fully drain the detention pond within 4.25 hours.

Also attached for informational purposes is Attachment G— Proposed Landscaping Plan for the College Reservoir Site.

Existing Concrete Outfall Structure at Ladera Arroyo

The existing development of the College site, completed in March 1981, included the construction of a concrete headwall structure at the south bank of the Ladera Arroyo. This outfall structure is used to convey well washwater from College Well No. 1 and overflow from the College Reservoir to the Ladera Arroyo. Original design drawings for this structure along with the erosion control improvements are included in the Appendix. The College Well No. 1 discharges washwater to the Ladera Arroyo at the beginning and end of each pumping cycle. The well washwater is discharged into the Ladera Arroyo at a rate of 1680 gallons-per-minute (3.74 feet-per-second). There are no visible impacts, of this point

discharge, on the Ladera Arroyo from an erosion aspect. This is illustrated in the photographs included in the Appendix. The photographs clearly show no erosion or cutting away of the arroyo banks downstream (east) of the concrete headwall structure. The only erosion and undercutting of the arroyo banks is present on the upstream (west) side of the concrete headwall structure. The wire enclosed riprap, constructed around the outfall structure, has remained intact since it's initial construction and continues to provide protection to the existing Ladera Arroyo channel from discharges originating from the College Reservoir site.

The storm water discharged from the proposed detention basin will be limited to a maximum rate of 1.20-cfs, which is much less than the washwater rate of 3.74-cfs currently being discharged to the Ladera Arroyo.

Erosion Control Measures

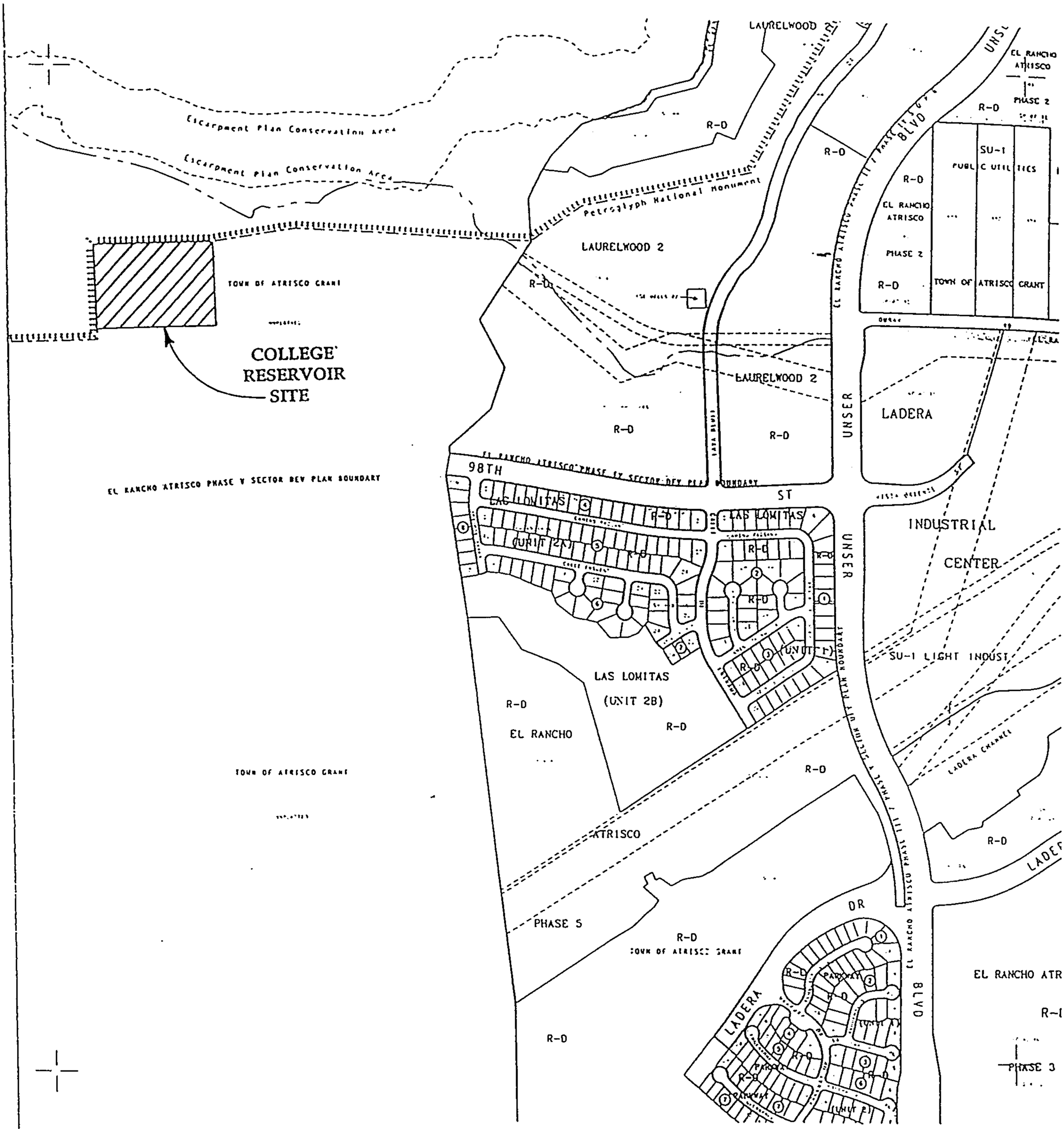
Temporary Erosion Control Measures During Construction: During the rough grading, placement of structural fill and construction of the storm sewer improvements and the new detention pond, erosion of soil from the site will controlled by the installation of temporary silt fencing along the north and east property lines. The contractor will be required to construct and maintain the temporary silt fencing to prevent the erosion of soil from the site and into the existing Ladera Arroyo. The contractor will also be required to provide dust abatement measures to prevent air born transport of soil particles during construction activities, including all cut and fill areas as well as haul roads and site access road.

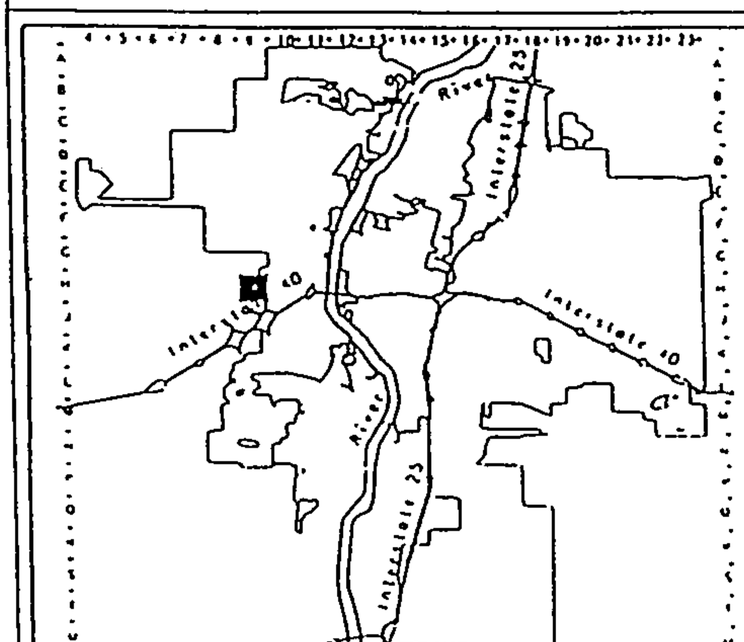
Permanent Erosion Control Measures After Construction: Upon completion of the proposed improvements all areas of the site, including haul roads and exterior sloped surfaces of the detention pond shall be reseeded with reclamation seed mix. The reclamation seed mix shall be provided and installed as specified in Section 1012 "NATIVE GRASS SEEDING" of the City of Albuquerque Standard Specifications for Public Works Construction. The inlet rundown channel to the detention pond will be lined with grouted riprap. The bottom and interior slopes of the detention pond will be lined with wire enclosed riprap materials.

Attachments

A.	Site Vicinity Map
B.	100 Year Flood Plane Map, showing location of the College Reservoir site
C.	Calculations on existing and proposed runoff flow and volume
D.	Preexisting Site Topography
E.	Existing Site Grading and Drainage Plan for the College Reservoir Site
F.	Proposed Site Grading and Drainage Plan for the Fully Developed College Reservoir Site
G.	Proposed Landscaping Plan for the College Reservoir Site
H.	Storm Water detention Pond Emergency Overflow Structure

Appendix	Existing Ladera Arroyo Concrete Outlet Structure





North

750 375 0 750

Scale 1" = 750'

A Municipal Geographic Information System

City of Albuquerque

© Planning Department July 03, 1993

LEGAL DESCRIPTION

T10N

R2E

SEC 9

UNIFORM PROPERTY CODE

1 009 059

H-9-Z

ATTACHMENT A

100 Year Flood Plane in the Vicinity of College Reservoir Site

ATTACHMENT 8

LADERA ARROYO

COLLEGE RESERVOIR SITE → COL 1

MIREHAVEN ARROYO

100 Year Flood Bound

Streets

City Limits

N

W E

S

1 0 1 2 Miles

ATTACHMENT C

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 19 Soil Type for This Site is: **BKD – Bluepoint-Kokan Association, Hilly – Gravelly, loamy, fine sand**

Hydrologic Soil Group: **A**

From DPM Section 22.2 Table A-1: Precipitation Zone for this site is **Zone 1** (West of the Rio Grande)

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 = **2.20 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 = **4.70 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)

PreExisting Conditions

Site Data

Drainage Basin	Land Treatments	Area (acres)	Runoff Coefficient (C)	Excess Precipitation (E)
1	Undeveloped Area, Native grasses, weeds, 0-10% slope (Treatment A)	6.07	0.27	0.44
1	Undeveloped Area, Native grasses, weeds, 10%<20% slope (Treatment B)	0.00	0.43	0.67
1	Compacted Area, minimal vegetation, unpaved roads, gravel (Treatment C)	0.00	0.61	0.99
1	Impervious areas, pavement and roofs (Treatment D)	0.00	0.93	1.97

Total Area = 6.07 ac.

Preexisting Runoff Volumes – Total area=6.07 ac.

$Q_{100} = \Sigma(CiA) = (.27)(4.70)(6.07) +(.43)(4.70)(0.00) + (.61)(4.70)(0.00) + (.93)(4.70)(0.00)$

$Q_{100} = 7.70$ cfs

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

$V_{100} = 3630 \times \Sigma(E \times A) = 3630\ [(0.44)(6.07) + (0.67)(0.00) + (0.99)(0.00) + (1.97)(0.00)] = 9{,}695$ cf

Existing Developed Conditions

Site Data

Drainage Basin	Land Treatments	Area (acres)	Runoff Coefficient (C)	Excess Precipitation (E)
1	Undeveloped Area, Native grasses, weeds, 0-10% slope (Treatment A)	1.14	0.27	0.44
1	Undeveloped Area, Native grasses, weeds, 10%<20% slope (Treatment B)	0.41	0.43	0.67
1	Compacted Area, minimal vegetation, unpaved roads, gravel (Treatment C)	0.04	0.61	0.99
1	Impervious areas, pavement and roofs (Treatment D)	0.90	0.93	1.97
2	Undeveloped Area, Native grasses, weeds, 0-10% slope (Treatment A)	2.36	0.27	0.44
2	Undeveloped Area, Native grasses, weeds, 10%<20% slope (Treatment B)	0.74	0.43	0.67
2	Compacted Area, minimal vegetation, unpaved roads, gravel (Treatment C)	0.40	0.61	0.99
2	Impervious areas, pavement and roofs (Treatment D)	0.08	0.93	1.97

Total Area = 6.07 ac.

Drainage Basin 1 (Runoff Retained on-site) – Total area=2.49 ac.

$Q_{100} = \Sigma(CiA) = (.27)(4.70)(1.14) +(.43)(4.70)(0.41) + (.61)(4.70)(0.04) + (.93)(4.70)(0.90)$

Q_{100} = 6.32 cfs

Area impervious = 0.90 ac.: % impervious = 36.1%

$V_{100} = 3630 \times \Sigma(E \times A) = 3630\ [(0.44)(1.14) + (0.67)(0.41) + (0.99)(0.04) + (1.97)(0.90)] = 9{,}398$ cf

Drainage Basin 2 (Runoff flows off-site) – Total area=3.58 ac.

$Q_{100} = \Sigma(CiA) = (.27)(4.70)(2.36) +(.43)(4.70)(0.74) + (.61)(4.70)(0.40) + (.93)(4.70)(0.08)$

Q_{100} = 5.99 cfs

Area impervious = 0.08 ac.: % impervious = 2.2%

$V_{100} = 3630 \times \Sigma(E \times A) = 3630\ [(0.44)(2.36) + (0.67)(0.74) + (0.99)(0.40) + (1.97)(0.08)] = 7{,}579$ cf

Fully Developed Conditions

Site Data

Drainage Basin	Land Treatments	Area (acres)	Runoff Coefficient (C)	Excess Precipitation (E)
1	Undeveloped Area, Native grasses, weeds, 0-10% slope (Treatment A)	1.10	0.27	0.44
1	Undeveloped Area, Native grasses, weeds, 10%<20% slope (Treatment B)	0.00	0.43	0.67
1	Compacted Area, minimal vegetation, unpaved roads, gravel (Treatment C)	0.52	0.61	0.99
1	Impervious areas, pavement and roofs (Treatment D)	1.63	0.93	1.97
2	Undeveloped Area, Native grasses, weeds, 0-10% slope (Treatment A)	1.97	0.27	0.44
2	Undeveloped Area, Native grasses, weeds, 10%<20% slope (Treatment B)	0.00	0.43	0.67
2	Compacted Area, minimal vegetation, unpaved roads, gravel (Treatment C)	0.59	0.61	0.99
2	Impervious areas, pavement and roofs (Treatment D)	0.26	0.93	1.97

Total Area = 6.07 ac.

Drainage Basin 1 (Runoff Detained on-site) – Total area=3.26 ac.

$Q_{100} = \Sigma(CiA) = (.27)(4.70)(1.10) +(.43)(4.70)(0.00) + (.61)(4.70)(0.52) + (.93)(4.70)(1.63)$

Q_{100} = 10.01 cfs

Area impervious = 1.63 ac.: % impervious = 50.0%

$V_{100} = 3630\ [(0.44)(1.10) + (0.67)(0.00) + (0.99)(0.52) + (1.97)(1.63)] = 15{,}282$ cf

Drainage Basin 2 (Runoff flows off-site) – Total area=2.81 ac.

$Q_{100} = \Sigma(CiA) = (.27)(4.70)(1.97) +(.43)(4.70)(0.00) + (.61)(4.70)(0.59) + (.93)(4.70)(0.26)$

Q_{100} = 5.33 cfs

Area impervious = 0.26 ac.: % impervious = 9.3%

$V_{100} = 3630\ [(0.44)(1.97) + (0.67)(0.00) + (0.99)(0.59) + (1.97)(0.26)] = 7{,}126$ cf

Storm Water Detention Pond

The new storm water detention pond has been sized to collect and store the total runoff volume of 15,282 CF, from Basin 1, for the 100-year 6-hour storm event. The top of the storm water detention pond will be constructed at an elevation 1.25-feet above the weir elevation of the emergency overflow structure, providing 1.25-feet of freeboard in the detention basin. The emergency overflow structure (see attachment H) will covey all runoff volumes in excess of the 100-year 6-hour storm event directly to the Ladera Arroyo through the existing 24-inch RCP reservoir overflow/drain line. The drainage rate of the detention pond will be controlled off the soffit elevation of the drain orifice opening in the emergency overflow structure. The difference between the weir elevation of the emergency overflow and the soffit elevation of the 4-inch drain orifice (short tube) results in a maximum available head of 4-foot 5-inches. This will allow a maximum discharge rate, from the detention pond to the Ladera Arroyo, of 1.20-cfs as follows:

$$Q = Cd\ A\ (2g\ H)^{.5}$$

$$Q = 0.82 \times 0.087\ (64.4 \times 4.42)^{.5} = 1.20\text{-cfs}$$

The draining of the detention pond will contribute a maximum of 1.2-cfs to the Ladera Arroyo and will drain the 100-year 6-hour storm volume completely in 4.25 hours. Pond volume and time to drain calculations are shown on page 6 of Attachment C.

The emergency overflow structure, shown in attachment H, is designed to accept the 6-hour local storm probable maximum precipitation (PMP) for the Albuquerque/Bernalillo County Zone Atlas Grid H-9. From the City of Albuquerque DPM Section 22.2 Figure D-5, the PMP_{360} is estimated to be 12.25-inches.

$$Q_{(PMP_{360})} = \Sigma(CiA) = (.27)(12.25)(1.10) + (.43)(12.25)(0.00) + (.61)(12.25)(0.52) + (.93)(12.25)(1.63)$$

$$Q_{(PMP_{360})} = 26.09 \text{ cfs}$$

The emergency overflow structure, shown in attachment H, provides a total weir length of 16-feet. The overflow weir acts as a broadcrested weir without end constrictions. The submergence depth of the overflow weir to discharge the 26.09-cfs is 0.62-feet. Assuming a 7.5-inch submergence depth, the capacity of the overflow weir is 26.33-cfs as follows:

$$Q = 3.33 \times L \times H^{1.5}$$

$Q = 3.33 \times 16 \times 0.625^{1.5} = 26.33$ cfs > 26.09 cfs for $Q_{(PMP_{360})}$.

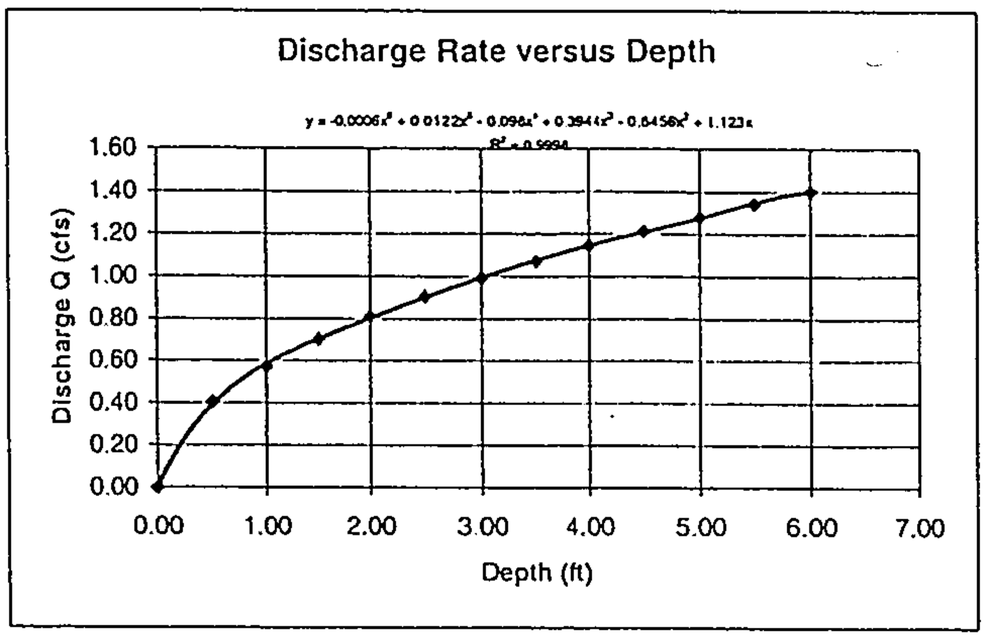
Detention Pond Design Calculations

Orifice discharge rate versus head

$Q=C_d \times A \times (2gxH)^{0.5}$ Orifice Equation

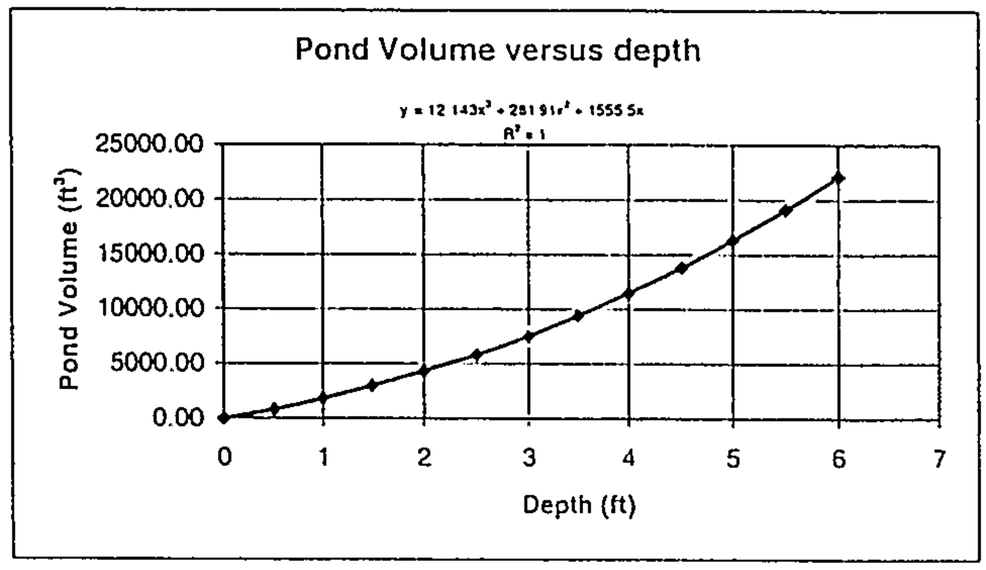
where: Q=discharge rate(cfs)
C_d=discharge coefficient
A=area of orifice opening
H=head, feet

H	C_d	A	$(2gxH)^{0.5}$	Q
0.00	0.82	0.09	0.00	0.00
0.50	0.82	0.09	5.67	0.40
1.00	0.82	0.09	8.02	0.57
1.50	0.82	0.09	9.83	0.70
2.00	0.82	0.09	11.35	0.81
2.50	0.82	0.09	12.69	0.91
3.00	0.82	0.09	13.90	0.99
3.50	0.82	0.09	15.01	1.07
4.00	0.82	0.09	16.05	1.15
4.50	0.82	0.09	17.02	1.21
5.00	0.82	0.09	17.94	1.28
5.50	0.82	0.09	18.82	1.34
6.00	0.82	0.09	19.66	1.40



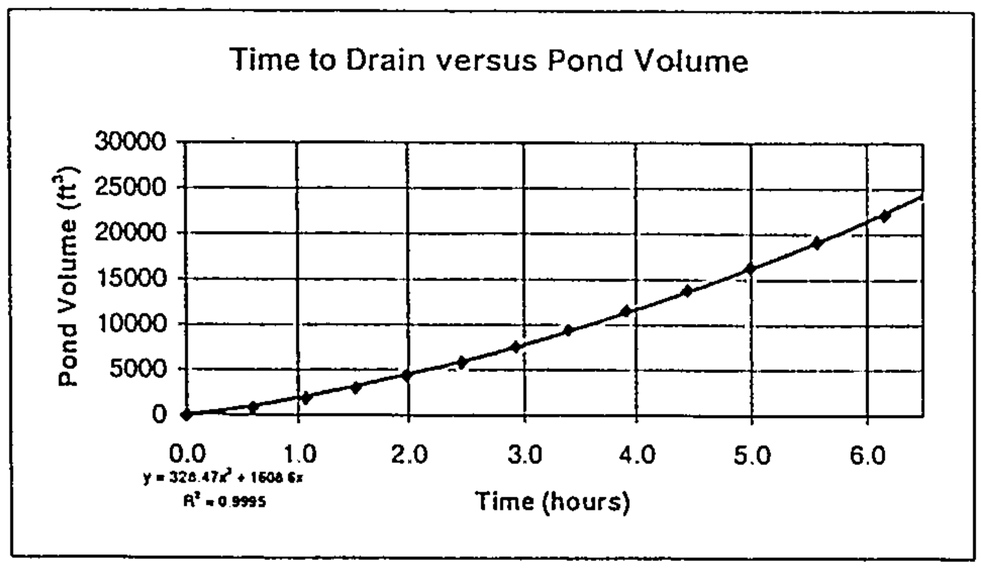
Pond Volume as Function of Depth

depth	area 1	area 2	volume 1	Volume 2	pond volume
0.00	1564.00	1560.00	0.00	0.00	0.00
0.50	1564.00	1842.00	782.00	69.50	851.50
1.00	1564.00	2136.00	1564.00	286.00	1850.00
1.50	1564.00	2447.00	2346.00	662.25	3008.25
2.00	1564.00	2771.00	3128.00	1207.00	4335.00
2.50	1564.00	3108.00	3910.00	1930.00	5840.00
3.00	1564.00	3457.00	4692.00	2839.50	7531.50
3.50	1564.00	3818.00	5474.00	3944.50	9418.50
4.00	1564.00	4191.00	6256.00	5254.00	11510.00
4.50	1564.00	4576.00	7038.00	6777.00	13815.00
5.00	1564.00	4973.00	7820.00	8522.50	16342.50
5.50	1564.00	5383.00	8602.00	10502.25	19104.25
6.00	1564.00	5804.00	9384.00	12720.00	22104.00



Time to Drain as Function of Pond Volume

Pond Water Depth	Pond Volume (ft^3)	Average Discharge Rate	Change in Pond Volume	Elapsed Time Seconds	Elapsed Time Hours
0.00	0.00	0.00		0.00	0.00
0.50	851.50	0.40	851.50	2103.41	0.58
1.00	1850.00	0.57	998.50	3847.51	1.07
1.50	3008.25	0.70	1158.25	5499.40	1.53
2.00	4335.00	0.81	1326.75	7138.09	1.98
2.50	5840.00	0.91	1505.00	8800.70	2.44
3.00	7531.50	0.99	1691.50	10506.53	2.92
3.50	9418.50	1.07	1887.00	12268.35	3.41
4.00	11510.00	1.15	2091.50	14094.99	3.92
4.50	13815.00	1.21	2305.00	15992.96	4.44
5.00	16342.50	1.28	2527.50	17967.33	4.99
5.50	19104.25	1.34	2761.75	20024.30	5.56
6.00	22104.00	1.40	2999.75	22163.41	6.16



Summary and Comparison

Drainage Basin 1 (Runoff Detained on-site)

Q_{100} = 10.01 cfs

V_{100} = 15,282 cf

Temporary Storage Volume Required	= 15,282 cf
Temporary Storage Volume Provided	= 22,104 cf
Excess Storage Volume Provided	= 6,822 cf
Maximum Rate of release from Detention Basin to Ladera Arroyo	= 1.20 cfs

Drainage Basin 2 (Runoff flows off-site)

Q_{100} = 5.33 cfs

V_{100} = 7,126 cf

Total Site Runoff

Change in Q_{100} from the PreExisting conditions (sheetflow to Ladera Arroyo)

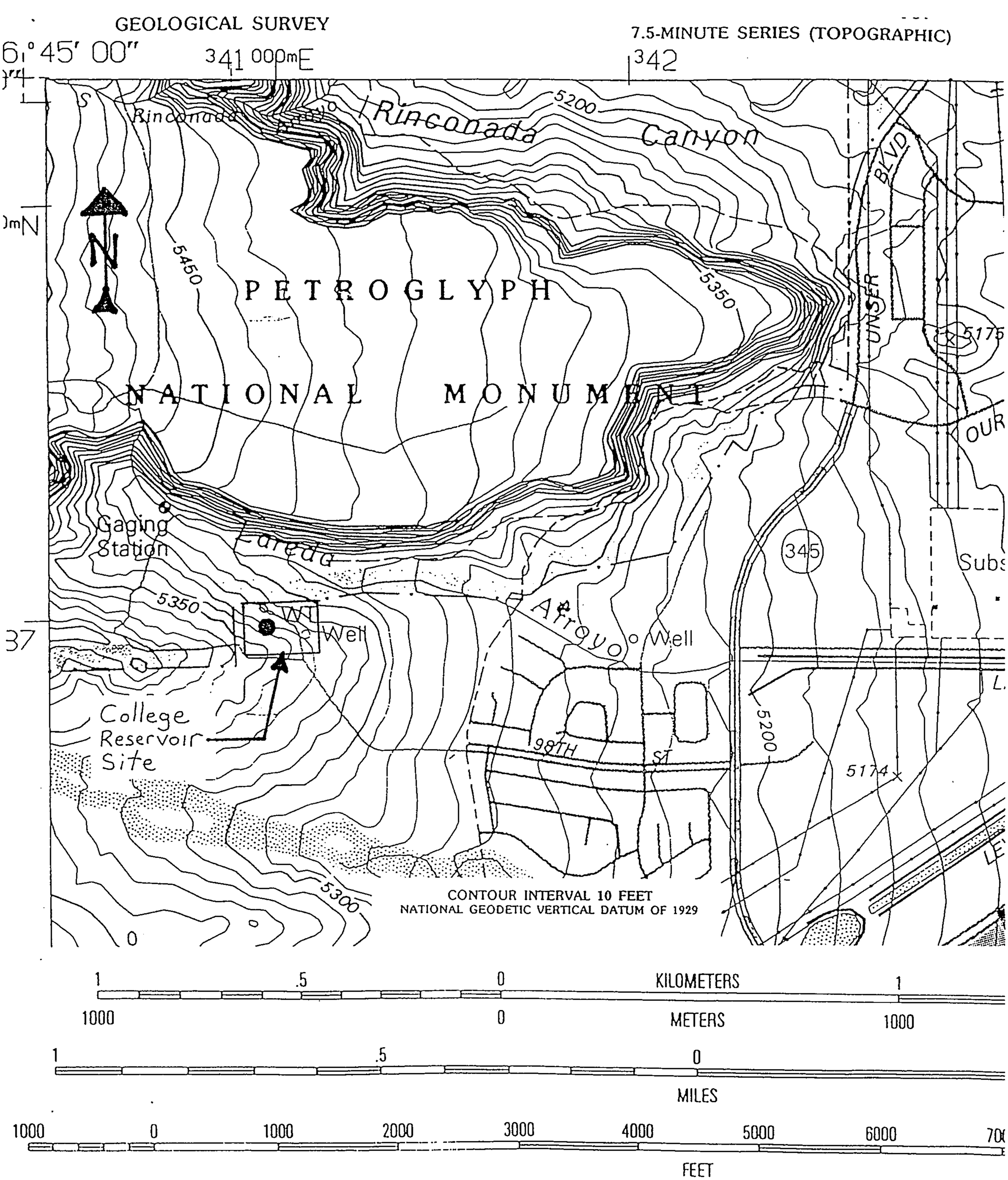
= 5.33 cfs (fully developed) – 7.70 cfs (PreExisting) = -2.37 cfs (decrease)

Change in Q_{100} from the PreExisting conditions (point discharge to the Ladera Arroyo)

= 1.20 cfs (increase)

Total net change in site runoff to the Ladera Arroyo from PreExisting conditions

= 5.33 cfs +1.20 cfs (fully developed) – 7.70 cfs (PreExisting) = -1.17 cfs (decrease)



ATTACHMENT D

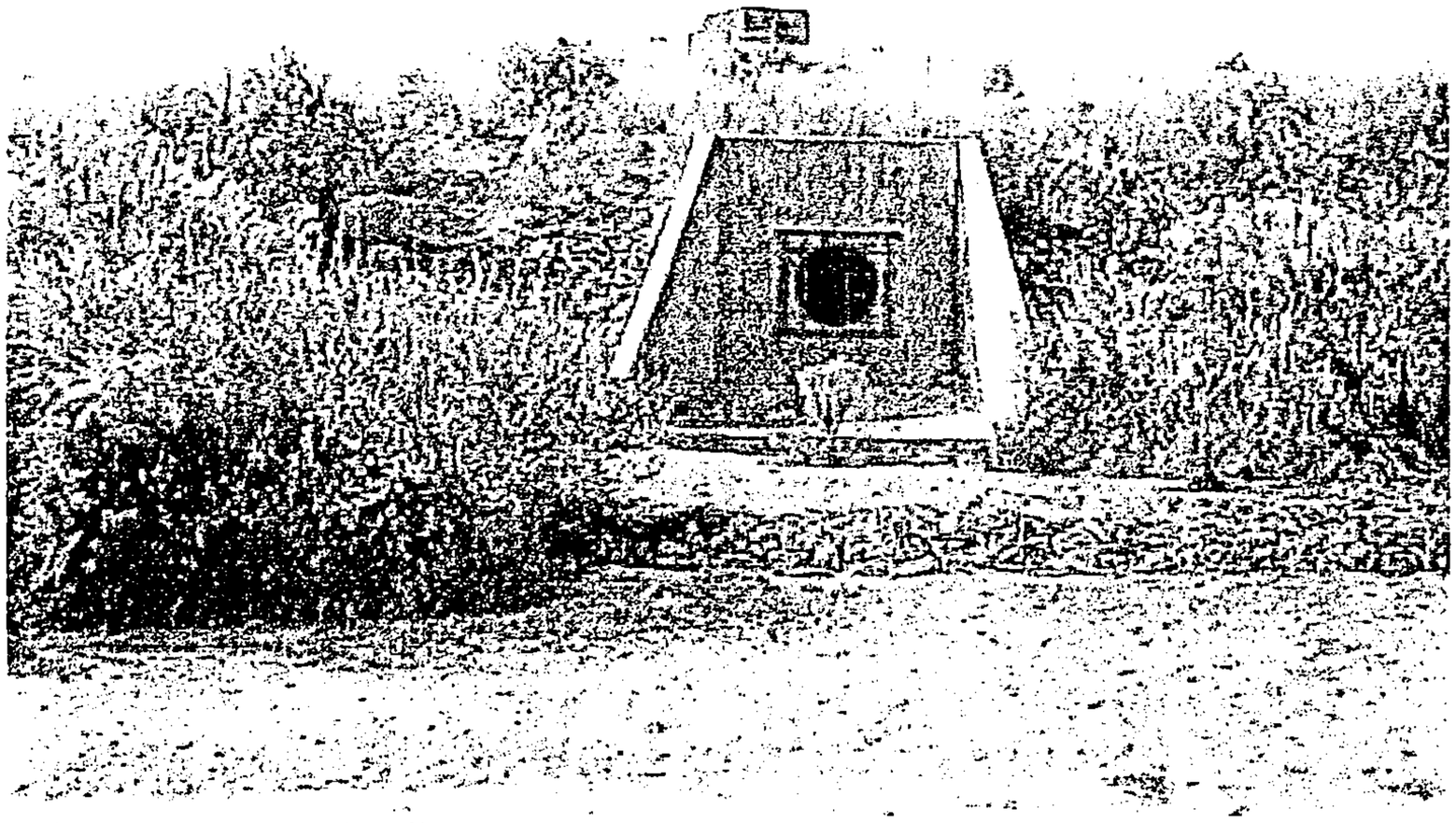
PREEXISTING SITE TOPOGRAPHY

Arsenic Removal Demonstration Facility and College Pump Station Drainage Report

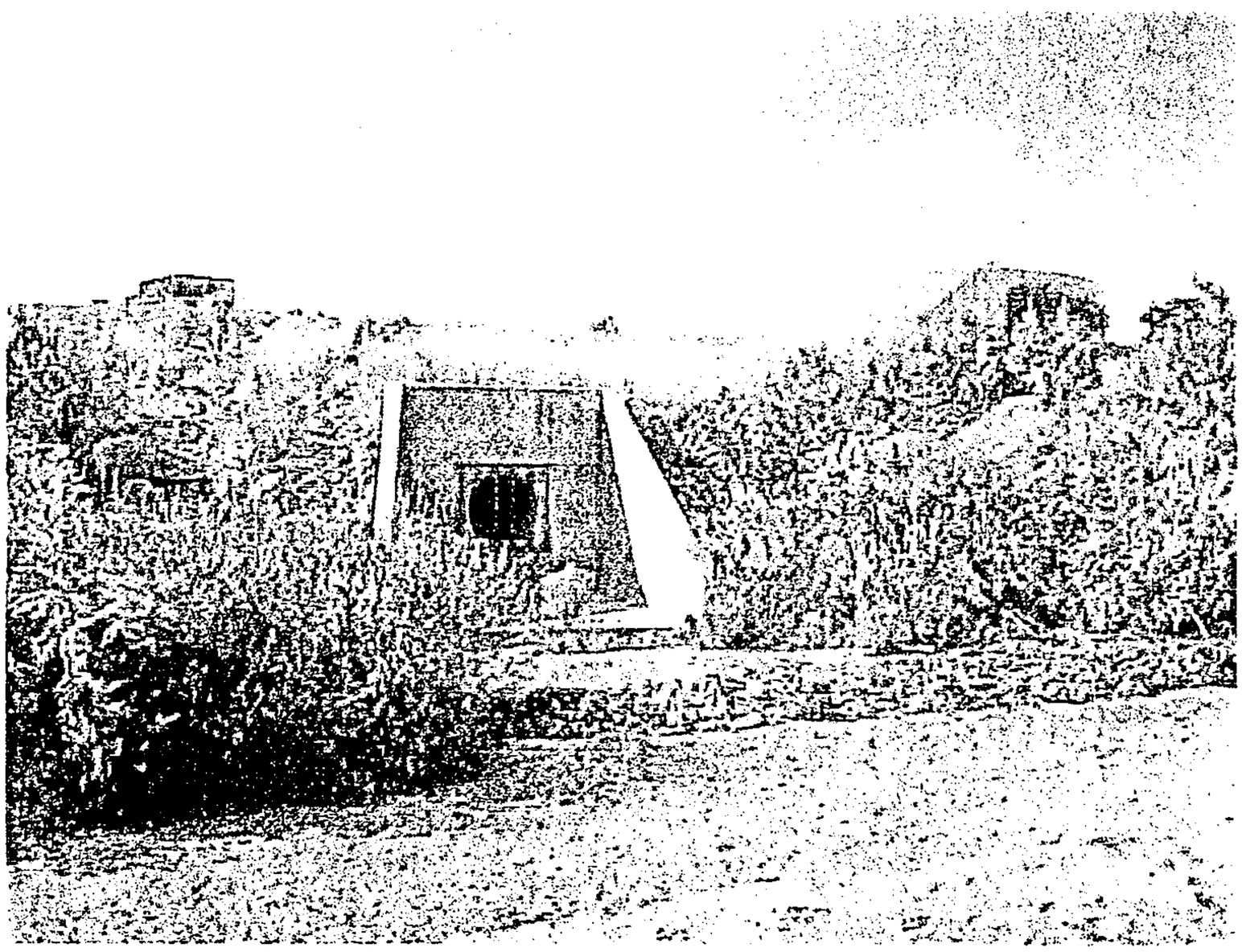
APPENDIX

EXISTING CONCRETE OUTFALL STRUCTURE

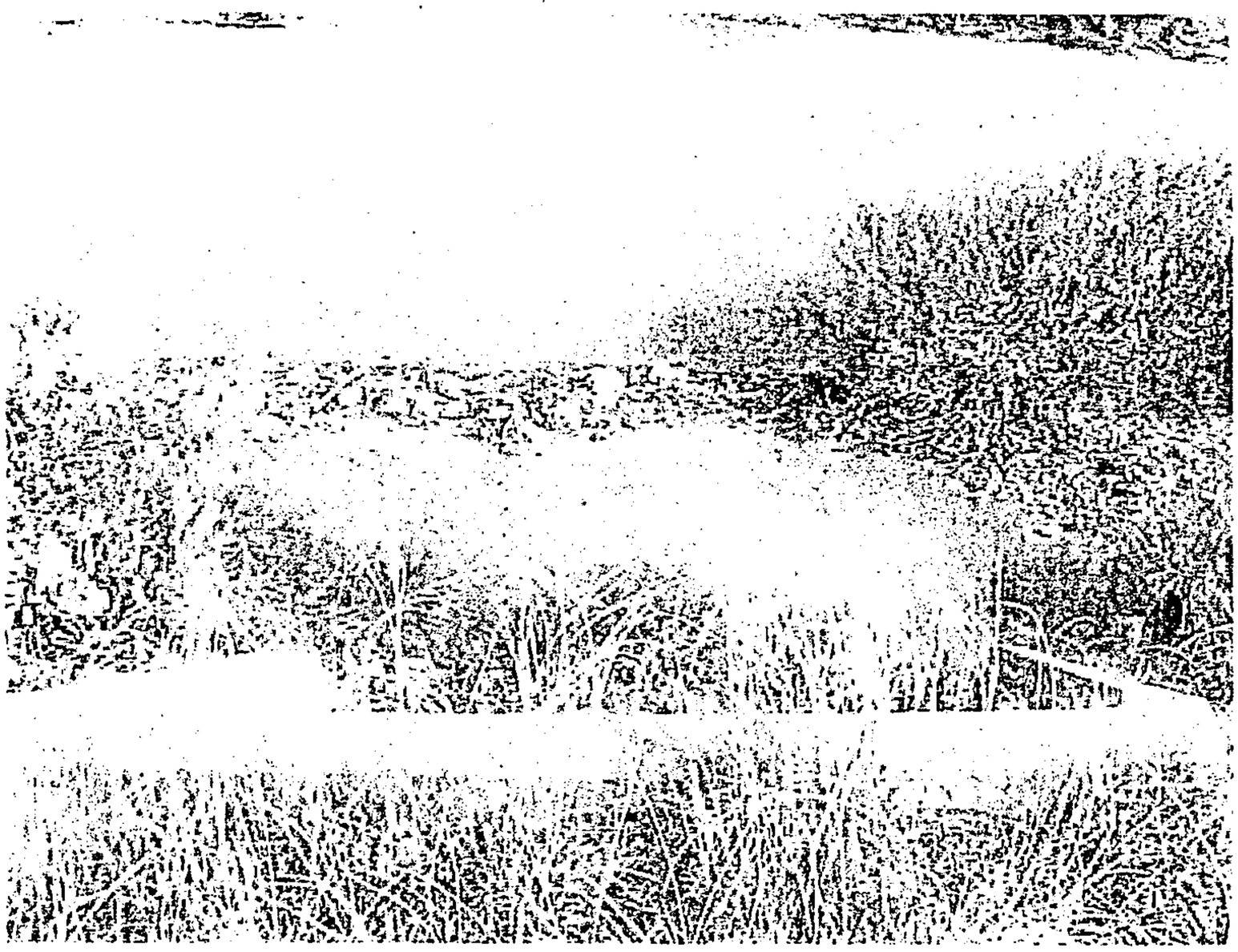
AT LADERA ARROYO



Existing concrete headwall structure at south bank of the Ladera Arroyo (looking south).

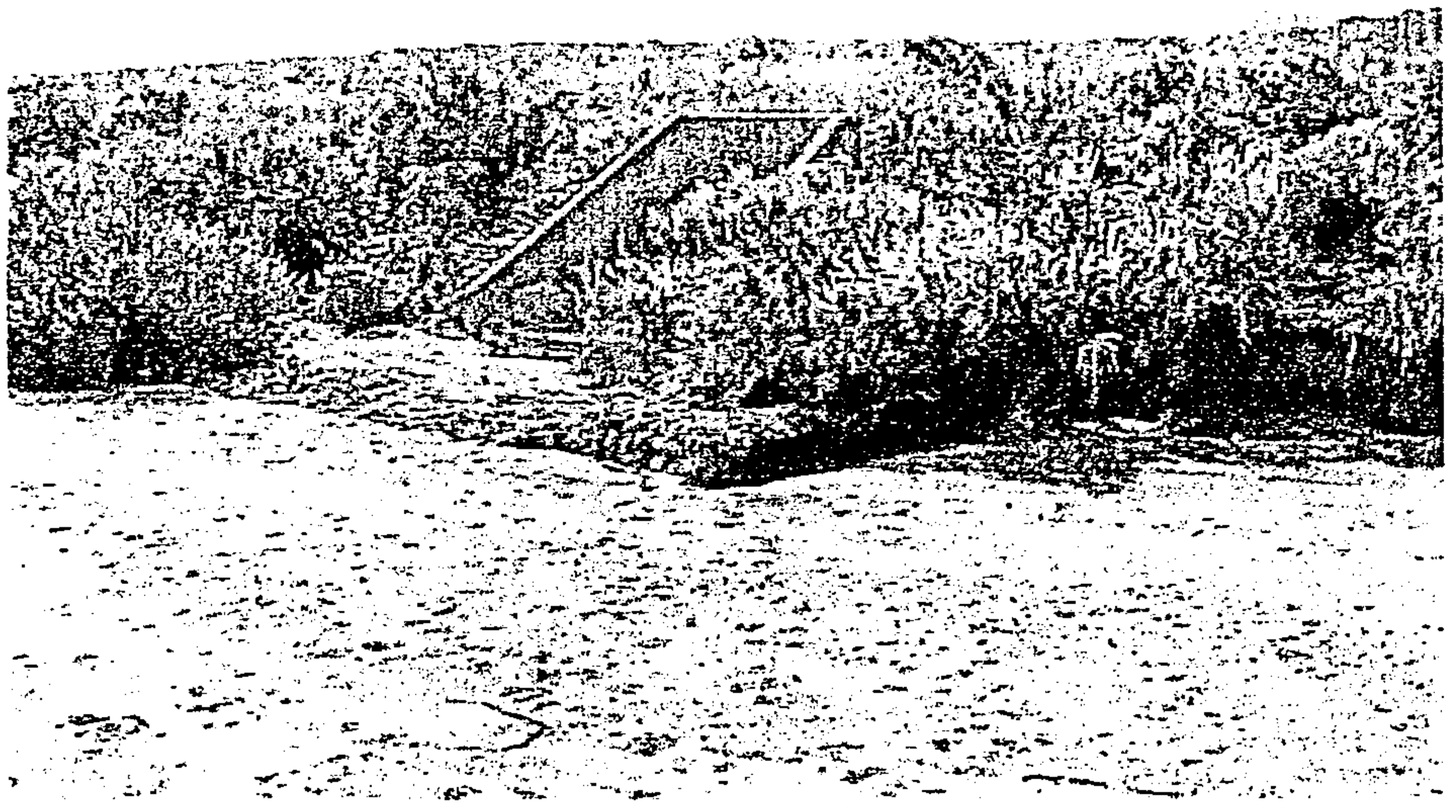


Existing concrete headwall structure at south bank of the Ladera Arroyo (looking south).

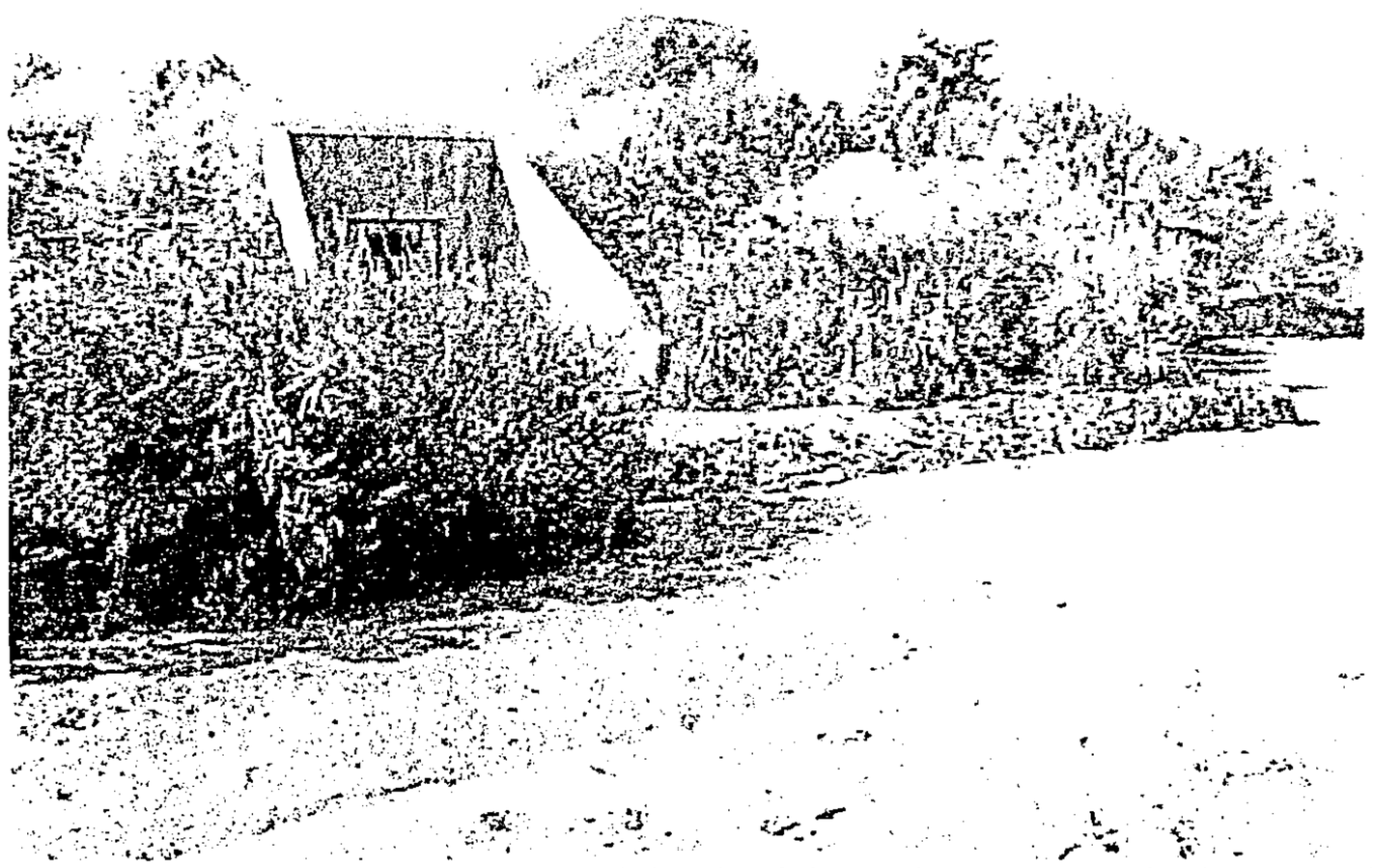


Existing concrete headwall structure at south bank of the Ladera Arroyo (looking north).

Existing concrete headwall structure at south bank of the Ladera Arroyo (looking east).

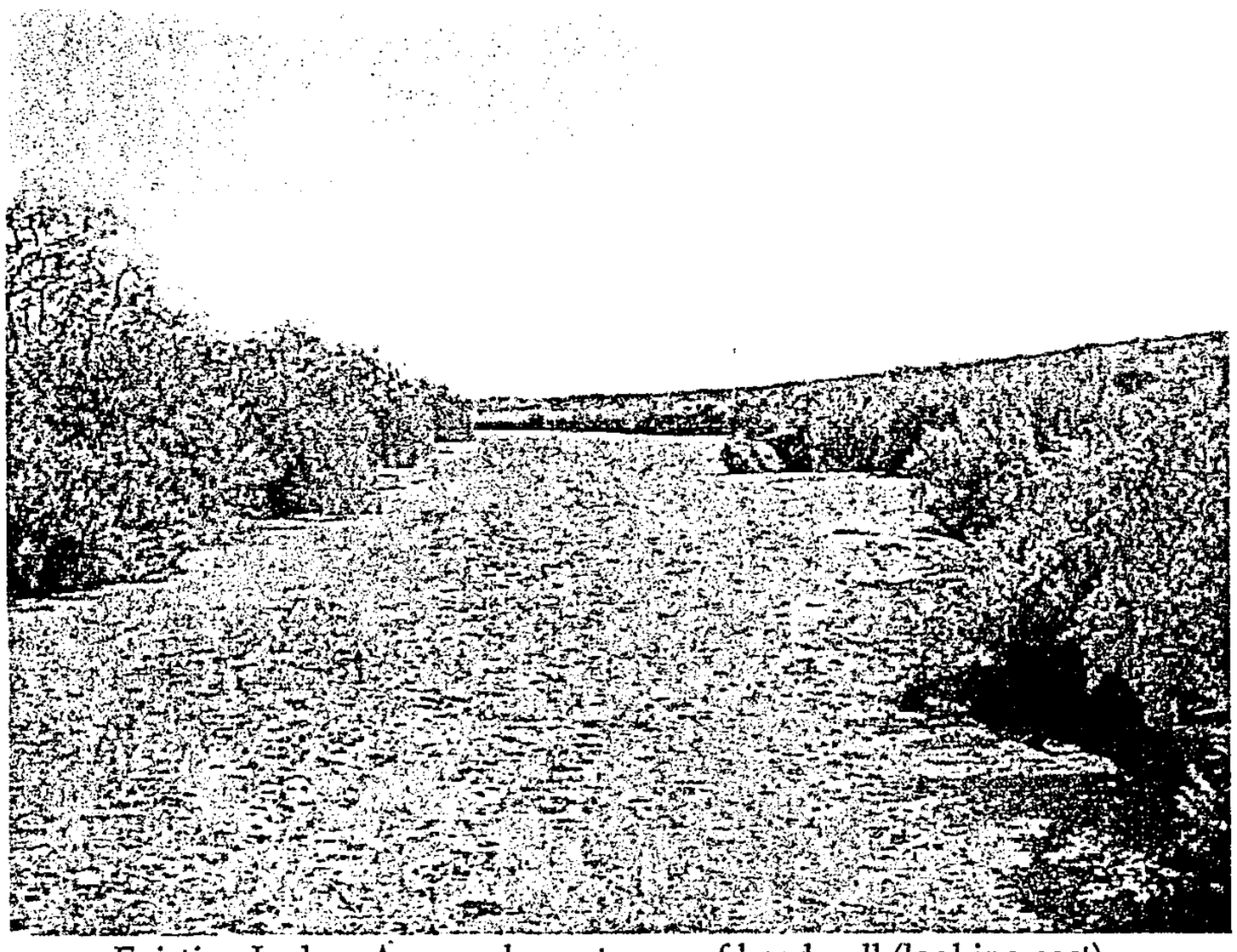


Existing concrete headwall structure at south bank of the Ladera Arroyo (looking southeast).



Existing concrete headwall structure at south bank of the Ladera Arroyo (looking southwest).

Existing Ladera Arroyo upstream of headwall (looking west).



Existing Ladera Arroyo downstream of headwall (looking east).

H11/D000 File

CITY OF ALBUQUERQUE, NEW MEXICO

WEST MESA DIVERSION PROJECT
DRAINAGE ANALYSIS

COA PROJECT NO. 5381-01
PUBLIC WORKS DEPARTMENT
HYDROLOGY DIVISION

DRAFT REPORT: MAY 1997

Prepared by

SMITH ENGINEERING COMPANY
6400 UPTOWN BOULEVARD NE SUITE 500E
ALBUQUERQUE, NEW MEXICO 87110

SEC No. 196105

D[s16.67h8.5v0T[s18D
AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994 RUN DATE (MON/DAY/YR) =06/24/2002
INPUT FILE = 42mod1.in USER NO.= C_ANDRSN.I01

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
										TIME= .00
START										RAIN24= 2.660
RAINFALL TYPE= 2										PK BF = 1.02
SEDIMENT BULK										
COMPUTE NM HYD	A1-D&AP-1	-	1	.06440	87.83	7.319	2.13089	1.800	2.131	PER IMP= 80.00
ROUTE MCUNGE	AP-1.R	1	2	.06440	85.93	7.296	2.12420	1.850	2.085	CCODE = .2
COMPUTE NM HYD	B3-D&AP-2	-	88	.01900	41.13	2.341	2.30977	1.550	3.382	PER IMP= 90.00
COMPUTE NM HYD	B1-D&AP-3	-	1	.02930	74.98	3.330	2.13089	1.500	3.999	PER IMP= 80.00
ROUTE MCUNGE	AP-3.R	1	3	.02930	69.31	3.304	2.11441	1.550	3.696	CCODE = .2
COMPUTE NM HYD	B2-D	-	1	.01850	30.94	2.102	2.13089	1.650	2.613	PER IMP= 80.00
ADD HYD	AP-4	1& 3	70	.04780	92.51	5.407	2.12077	1.550	3.024	
ADD HYD	PART_AP-5	70&88	5	.06680	133.63	7.747	2.17452	1.550	3.126	
ADD HYD	AP-5	5& 2	89	.13120	173.23	15.043	2.14981	1.650	2.063	
ROUTE MCUNGE	AP-5.R	89	2	.13120	171.72	15.023	2.14690	1.650	2.045	CCODE = .2
COMPUTE NM HYD	C3-D	-	90	.01750	30.03	1.989	2.13089	1.650	2.681	PER IMP= 80.00
ADD HYD	PART_AP-7	2&90	3	.14870	201.75	17.011	2.14500	1.650	2.120	
COMPUTE NM HYD	C1-D&AP-6	-	1	.04860	88.78	5.060	1.95202	1.600	2.854	PER IMP= 70.00
ADD HYD	AP-7	3& 1	3	.19730	285.34	22.071	2.09746	1.650	2.260	
COMPUTE NM HYD	I40D-1	-	1	.12600	81.46	6.514	.96940	1.800	1.010	PER IMP= 25.00
ROUTE RESERVOIR	AP-11	1	2	.12600	4.84	5.813	.83529	3.400	.060	AC-FT= 4.688
ROUTE	AP-11.R	2	4	.12600	4.81	5.581	.83056	3.650	.060	
COMPUTE NM HYD	I40D-2	-	1	.04840	60.20	2.502	.96940	1.500	1.943	PER IMP= 25.00
ADD HYD	AP-12	1& 4	5	.17440	60.21	8.084	.86909	1.500	.539	
ROUTE	AP-12.R	5	6	.17440	55.62	8.068	.86745	1.600	.498	
COMPUTE NM HYD	C4-D	-	1	.03820	91.98	3.977	1.95201	1.500	3.762	PER IMP= 70.00
ADD HYD	AP-13	1& 6	4	.21260	136.62	12.045	1.06232	1.550	1.004	
ROUTE MCUNGE	AP-13.R	4	6	.21260	135.07	12.034	1.06132	1.550	.993	CCODE = .1
COMPUTE NM HYD	C5-D	-	1	.03950	74.99	3.622	1.71947	1.550	2.966	PER IMP= 57.00
ADD HYD	AP-14	1& 6	7	.25210	210.06	15.656	1.16444	1.550	1.302	
ROUTE MCUNGE	AP-14.R	7	8	.25210	201.88	15.624	1.16204	1.550	1.251	CCODE = .2
COMPUTE NM HYD	C6-D	-	1	.02530	50.91	2.851	2.11301	1.600	3.144	PER IMP= 79.00
ADD HYD	AP-15	1& 8	9	.27740	252.76	18.475	1.24877	1.550	1.424	
ROUTE MCUNGE	AP-15.R	9	10	.27740	249.83	18.426	1.24648	1.600	1.407	CCODE = .2
COMPUTE NM HYD	C2-D	-	1	.00970	23.97	1.010	1.95202	1.500	3.764	PER IMP= 70.00
ADD HYD	AP-15A	10& 1	9	.28710	265.94	19.436	1.26935	1.600	1.447	
ROUTE MCUNGE	AP-15A.R	9	10	.28710	261.63	19.390	1.26634	1.600	1.424	CCODE = .2
COMPUTE NM HYD	C7-D	-	1	.00560	10.61	.583	1.95201	1.600	2.960	PER IMP= 70.00
ADD HYD	AP-16	1&10	30	.29270	272.24	19.973	1.27945	1.600	1.453	
ADD HYD	PART_AP-16A	3&30	21	.49000	555.45	42.044	1.60883	1.600	1.771	
COMPUTE NM HYD	CRDP-1	-	30	.00466	4.04	.115	.46298	1.500	1.355	PER IMP= .00
ADD HYD	AP-16A	21&30	30	.49466	558.71	42.159	1.59803	1.600	1.765	
ROUTE RESERVOIR	AP-17	30	33	.49466	95.97	41.839	1.53590	2.400	.303	AC-FT= 20.309
ROUTE MCUNGE	AP-17.R	33	12	.49466	95.98	41.835	1.53575	2.400	.303	CCODE = .2
COMPUTE NM HYD	D1-D&AP-18	-	1	.03270	39.52	2.780	1.59426	1.700	1.889	PER IMP= 50.00
ADD HYD	PART_AP-19	1&12	40	.52736	114.56	44.616	1.58628	1.850	.339	
COMPUTE NM HYD	D3-D&AP-22	-	1	.02640	62.67	3.252	2.30977	1.550	3.709	PER IMP= 90.00
ADD HYD	AP-19	1&40	34	.55376	143.47	47.868	1.62077	1.700	.405	
ROUTE MCUNGE	AP-19.R	34	41	.55376	143.43	47.852	1.62026	1.750	.405	CCODE = .2
COMPUTE NM HYD	D2-D&AP-20	-	42	.02950	34.94	2.508	1.59426	1.750	1.850	PER IMP= 50.00
ADD HYD	AP-21	41&42	43	.58326	178.37	50.361	1.61894	1.750	.478	
ROUTE MCUNGE	AP-21.R	43	44	.58326	178.36	50.352	1.61867	1.750	.478	CCODE = .2
COMPUTE NM HYD	I40D-3&AP-23	-	45	.00897	16.17	.842	1.75941	1.550	2.816	PER IMP= 64.00
ROUTE MCUNGE	AP-23.R	45	46	.00897	16.15	.842	1.76007	1.600	2.814	CCODE = .2
COMPUTE NM HYD	D4-D	-	47	.01500	36.12	1.562	1.95201	1.500	3.763	PER IMP= 70.00
ADD HYD	AP-24	47&46	48	.02397	45.38	2.404	1.88015	1.550	2.958	
ROUTE MCUNGE	AP-24.R	48	49	.02397	43.82	2.391	1.87044	1.650	2.857	CCODE = .1
COMPUTE NM HYD	D5-D	-	50	.04230	94.42	4.081	1.80891	1.500	3.488	PER IMP= 62.00
ADD HYD	AP-25	50&49	51	.06627	120.60	6.472	1.83116	1.550	2.844	
ROUTE MCUNGE	AP-25.R	51	52	.06627	113.10	6.427	1.81843	1.600	2.667	CCODE = .2
COMPUTE NM HYD	D6-D	-	53	.02330	45.70	2.426	1.95201	1.550	3.065	PER IMP= 70.00
ADD HYD	AP-26	53&52	54	.08957	157.69	8.853	1.85317	1.550	2.751	
ADD HYD	AP-27	44&54	56	.67283	315.23	59.205	1.64988	1.650	.732	
ROUTE MCUNGE	AP-27.R	56	58	.67283	310.86	59.167	1.64884	1.650	.722	CCODE = .2
COMPUTE NM HYD	E1-D&AP-28	-	94	.03430	81.53	4.225	2.30977	1.650	2.803	PER IMP= 90.00
ROUTE MCUNGE	AP-28.R	94	95	.03430	80.48	4.212	2.30250	1.700	2.755	CCODE = .2
ADD HYD	PART_AP-31	95&58	96	.70713	368.75	63.379	1.68054	1.650	.815	
COMPUTE NM HYD	I40D-4&AP-29	-	59	.01360	20.03	1.276	1.75941	1.650	2.301	PER IMP= 64.00
ROUTE MCUNGE	AP-29.R	59	60	.01360	18.89	1.269	1.74918	1.850	2.170	CCODE = .1
COMPUTE NM HYD	E2-D	-	61	.05010	119.12	5.933	2.22033	1.500	3.715	PER IMP= 85.00
ADD HYD	AP-30	61&60	62	.06370	119.39	7.201	2.11973	1.550	2.928	

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
ADD HYD	AP-31	96&62	97	.77083	456.46	70.581	1.71684	1.650	.925	
ROUTE MCUNGE	AP-31.R	97	67	.77083	449.76	70.501	1.71490	1.650	.912	CCODE = .2
COMPUTE NM HYD	F1-D&AP-32	-	68	.03155	76.14	3.887	2.30978	1.550	3.771	PER IMP= 90.00
ADD HYD	AP-33	68&67	69	.80238	503.83	74.388	1.73829	1.650	.981	
ROUTE MCUNGE	AP-33.R	69	70	.80238	496.65	74.308	1.73643	1.650	.967	CCODE = .2
COMPUTE NM HYD	I40D-5&AP-34	-	74	.01470	19.85	1.379	1.75941	1.700	2.110	PER IMP= 64.00

42M0D1.SUM

ADD HYD	AP-35 70874	99	.81708	516.28	75.687	1.73684	1.650	.987
FINISH								

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CITY OF ALBUQUERQUE, NEW MEXICO

WEST MESA DIVERSION PROJECT
DRAINAGE ANALYSIS

DRAFT COPY

CITY OF
Albuquerque

COA PROJECT NO. 5381-01
PUBLIC WORKS DEPARTMENT
HYDROLOGY DIVISION

See WMDP Revision Note Book For All Revision Information

Dft

If Changes Within This Document Should Also Be Implemented Into Final Report

Prepared by

Smith Engineering Company
A Full Service Engineering Company

DRAFT REPORT: MAY, 1997

)(415') = 151,475 FT² = 3.5 AC. = 0.0054 mi.²

54 mi.² = 0.0423 mi.²

64

4'-4' x 3' CBC

EXISTING DOUBLE 10' X 12' CBC

CONNECT TO EXISTING DOUBLE 10' X 12' CBC'S

ILIFF

FUTURE I-40 INTERCEPTOR

I-40

F1-D

2-6' x 3' CBC

E2-D

E1-D

D6-D

GLENRIO

RD

COORS ROAD

HANOI

WEST MESA DIVE
MAIN LINE STORM

D2-D

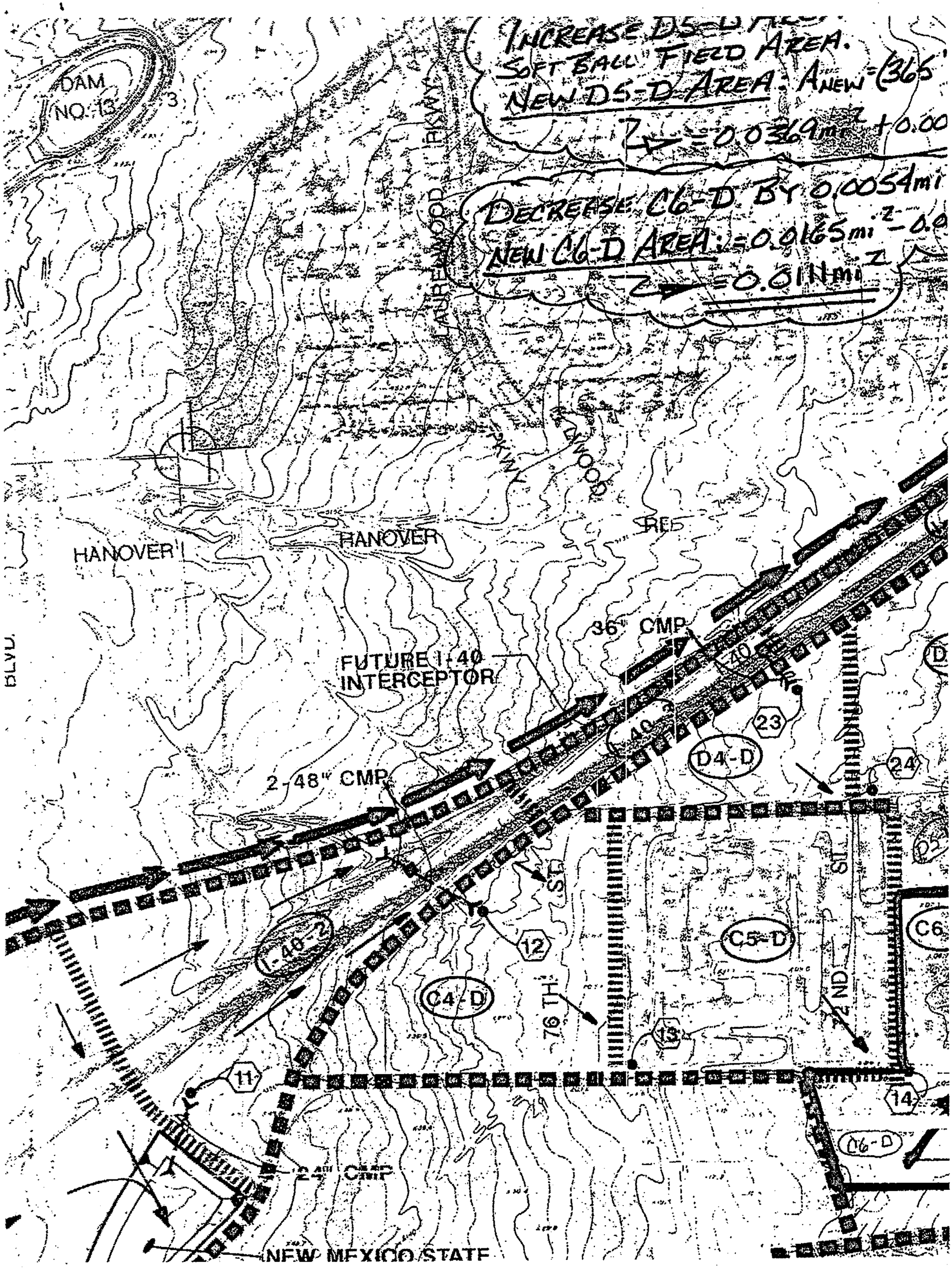
D3-D

D1-D

C2-D

ANALYSIS POINT OF AREA D3

22 ACTUALLY DRAINS TO THE SOUTH. THE AHYMO MODEL HAS BEEN MODIFIED.



INCREASE D5-D AREA.
SOFT BALL FIELD AREA.
NEW D5-D AREA: ANEW = (365
= 0.0369 mi² + 0.00
DECREASE C6-D BY 0.0054 mi
NEW C6-D AREA: = 0.0165 mi² − 0.0
= 0.0111 mi²
DAM NO. 13
3
LAURELWOOD PKWY
HANOVER
HANOVER
RE
36" CMP
FUTURE I-40 INTERCEPTOR
2-48" CMP
I-40-2
23
D4-D
24
12
C5-D
C4-D
76 TH
13
11
14
C6-D
24" CMP
NEW MEXICO STATE

CITY OF ALBUQUERQUE

October 31, 2007

David Price, P.E.
Camp Dresser & McKee Inc.
6000 Uptown Blvd. NE Ste 200
Albuquerque, NM 87110

Re: Arsenic Removal Demonstration Facility, 9900 98th Street NW, Approval of Permanent Certificate of Occupancy (C.O.)
Engineer's Stamp dated 11/09/05 (H-09/D011)
Certification dated 10/31/07

Based upon the information provided in your submittal received 10/31/07, the above referenced certification is approved for release of Permanent Certificate of Occupancy by Hydrology.

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

Sincerely,

Timothy Sims
Plan Checker, Planning Dept.
Development and Building Services

C: Katrina Sigala
File

P.O. Box 1293

Albuquerque

New Mexico 87103

www.cabq.gov

H9-DH

CDM
6000 Uptown Blvd., NE, Suite 200
Albuquerque, New Mexico 87110
tel: 505 243-3200
fax: 505 243-2700

C.O. 10/31/07

October 17, 2007

Brad Bingham

Mr. ~~Dan Hogan~~
City of Albuquerque - Hydrology Division
City Hall, 3rd Floor
400 Marquette NW
Albuquerque, NM 87102

Subject: Albuquerque Bernalillo County Water Utility Authority
Arsenic Removal Demonstration Facility
9900 98th Street NW, Albuquerque

Dear Mr. Hogan:

The construction of the above-subject facility has recently been completed. Attached are two record drawings (Sheet C-2 and C-3), which show the grading as constructed as well as yard piping, including storm drain piping. The Contractor, RMCI Inc., requested that our firm forward a copy of these drawings to your office.

The surface grading, paving, and storm drain piping were substantially constructed per the drawings approved by the City Hydrology Division dated 11/9/05. One change is at the storm water discharge to the detention pond. Instead of using riprap to convey the water down the slope to the pond, a buried 18-inch diameter storm pipe was installed with a horizontal flared end outlet. As shown on the attached record drawings, riprap was installed on the bottom of the pond in the vicinity of the storm drain outlet and the overflow structure.

If you have any questions regarding the attached information and drawings or require additional information on this facility, please call me at 243-3200.

Sincerely,

Dave Price, P.E.
Project Manager
Camp Dresser & McKee Inc.

Attachments - 2

CDM
6000 Uptown Blvd., NE, Suite 200
Albuquerque, New Mexico 87110
tel: 505 243-3200
fax: 505 243-2700

October 31, 2007

Mr. Brad Bingham
City of Albuquerque - Hydrology
400 Marquette NW
Albuquerque, NM 87102

Subject: Albuquerque Bernalillo County Water Utility Authority
Arsenic Removal Demonstration Facility
9900 98th Street NW, Albuquerque

Dear Mr. Bingham:

The construction of the above-subject facility has recently been completed. Attached are two record drawings (Sheet C-2 and C-3), which show the grading as constructed as well as yard piping, including storm drain piping. The Contractor, RMCI Inc., requested that our firm forward a copy of these drawings to your office.

The surface grading, paving, and storm drain piping were substantially constructed per the drawings approved by the City Hydrology Division dated 11/9/05. One change is at the storm water discharge to the detention pond. Instead of using riprap to convey the water down the slope to the pond, a buried 18-inch diameter storm pipe was installed with a horizontal flared end outlet. As shown on the attached record drawings, riprap was installed on the bottom of the pond in the vicinity of the storm drain outlet and the overflow structure.

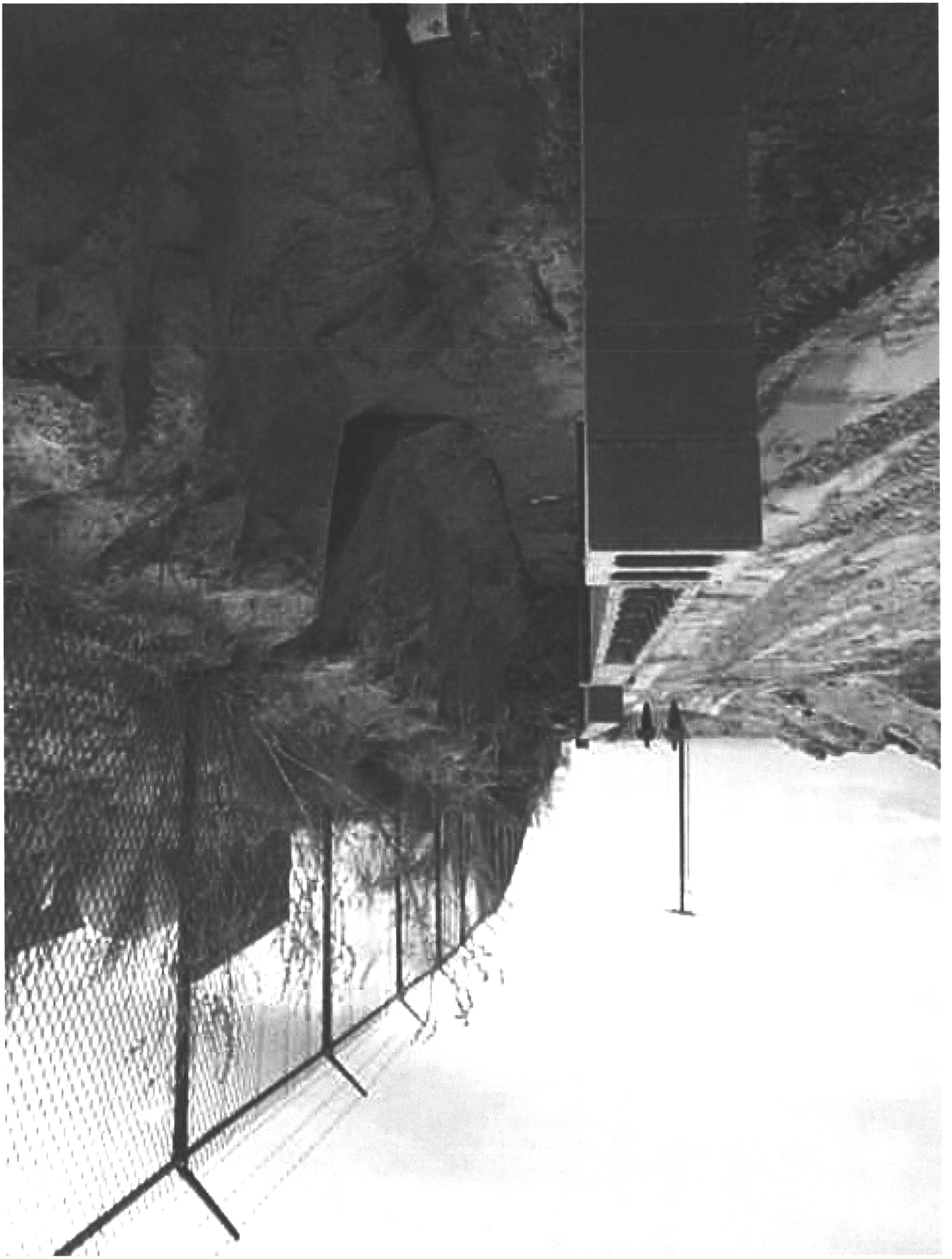
If you have any questions regarding the attached information and drawings or require additional information on this facility, please call me at 243-3200.

Sincerely,

Dave Price, P.E.
Project Manager
Camp Dresser & McKee Inc.

Attachments - 2

DAVID J. PRICE
NEW MEXICO
15314
LICENSED PROFESSIONAL ENGINEER
12-31-08
10/31/07



City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

May 4, 2000

Virginia Dery, PE
Leedshill Herkenhoff, Inc.
P.O. Box 1217
Albuquerque, NM 87103

Re: College Pump Station Grading Plan
Engineer's Stamp dated 4-10-00 (H9/D11)

Dear Ms. Dery,

Based upon the information provided in your submittal dated 4-11-00, the above referenced site is approved for Site Development Plan for Building Permit.

Please attach a copy of this approved plan to the construction sets prior to sign-off by Hydrology.

If you have any questions about my comments, you can contact me at 924-3986

Sincerely,

Bradley L. Bingham

Bradley L. Bingham, PE
Hydrology Review Engineer

C: file

THE CITY OF ALBUQUERQUE IS AN EQUAL OPPORTUNITY/REASONABLE ACCOMMODATION EMPLOYER

Leedshill-Herkenhoff, Inc.
an ASCG Company
500 Copper Avenue NW, Suite 500
P.O. Box 1217
Albuquerque, New Mexico 87103
(505) 247-0294 FAX (505) 242-4845

H-9/D011

Project No. 99012-04

LETTER OF TRANSMITTAL
WESTLAND WATER & SEWER INFRASTRUCTURE DESIGN

April 10, 2000

To: Hydrology Division
City of Albuquerque
P.O. Box 1293
Albuquerque, New Mexico 87103

RE: College Pump Station – Grading and Drainage Plan

The following checked item(s) is transmitted by: _X__ Attachment ____ Under Separate Cover

	Shop Dwg	X	Prints/Plans: 95% Design Drawings		Samples		Specifications
	Letter		Change Order		Pay Request		Other:

The following checked action(s) is needed.

X	For Approval		No Exceptions Taken		Resubmit ____ Copies for Approval
	For Your Use		Make Corrections Noted		Submit ____ Copies for Distribution
	As Requested		Rejected		Return ____ Corrected Copies
X	For Review and Comment		Revise and Resubmit		Other:

RECEIVED
APR 11 2000
HYDROLOGY SECTION

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Additional Comments:

I met with John Curtin, Hydrology, on April 6, to review Leedshill-Herkenhoff's (LH) grading and drainage plan submittal for the College Pump Station project. In accordance with our discussion, I am enclosing a copy of the Grading Plan (Sheet C4 of 17) for building permit approval. This plan follows the basic grading and drainage concepts presented in the City-approved, Proposed Site Grading and Drainage Plan (Attachment F enclosed) prepared by CH2MHill for the Arsenic Removal Demonstration Facility.

Attachment F shows the grading and drainage concepts for the entire College Reservoir site which encompasses the proposed arsenic removal demonstration facility and pump station, in addition to the existing well house and reservoir.

For information purposes, this submittal also includes the following items:

- Drainage Information Sheet for the College Pump Station;
- Dimensioned Site Layout Plan for College Pump Station;
- Existing Site Grading and Drainage Plan (Attachment E) for entire site; and
- copy of John Curtin's letter to CH2MHill approving the Final Plat and Site Development Plans for the arsenic facility.

As indicated in Mr. Curtin's letter, a few comments must be addressed in the Drainage Report prepared by CH2MHill before a building permit can be obtained for the arsenic removal facility. However, none of these comments impact the pump station since on-site flows from the pump station do not flow to the proposed storm water detention pond and historic drainage patterns are maintained by the new design.

As shown on Attachment F and LH's Grading Plan, on-site flows from the pump station area in Basin 2 will continue to flow north and east from the site across undeveloped lands and into the existing Ladera Arroyo. In addition, the runoff calculations presented on Attachment F for Basin 2 apply to the Basin 2 area delineated on LH's Grading Plan.

Based on John Curtin's recommendations, LH's Grading Plan includes a reference to Attachment F for the College Reservoir Site Drainage Plan (i.e., runoff calculations and description of on- and off-site flow conditions). Attachment F will be included in the plan check set for information purposes only.

RECEIVED
APR 11 2000
HYDROLOGY SECTION

If you have any questions or comments in regards to this submittal, please call me at 247-0294.

Transmitted by: LEEDSHILL-HERKENHOFF, INC.

Signed by:

Victoria A. Dery, P.E.
Project Manager

cc: Leroy Chavez, Westland (w/o encl.)
John Curtin (w/ encl.)
Kevin Broderick, City Planning (w/o encl.)
Art Stuart, City Water Utility Division (w/o encl.)
Charlie Leder, LH (w/o encl.)

RECEIVED
APR 11 2000
HYDROLOGY SECTION

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DRAINAGE INFORMATION SHEET

PROJECT TITLE: College Pump Station ZONE ATLAS/DRNG.FILE #: H-9

DRB #: _____ ELUC #: CSU-99-11 WORK ORDER #: _____

LEGAL DESCRIPTION: East ½ of NW ¼, Section 9, T10N, R2E

CITY ADDRESS: Approximately ¾ mile West of Unser Blvd. Along extension of 98th Street, NW

ENGINEERING FIRM: Leedshill-Herkenhoff, Inc. CONTACT: Victoria Dery, P.E.

ADDRESS: P.O. Box 1217, 87103 PHONE: 247-0294

OWNER: Westland Development Co., Inc. CONTACT: Leroy Chavez, P.E.

ADDRESS: 401 Coors Blvd., NW, Alb., NM 87121 PHONE: 831-9600

ARCHITECT: Same as Engineer CONTACT: _____

ADDRESS: _____ PHONE: _____

SURVEYOR: Bohannan Huston, Inc. CONTACT: Dwain Weaver

ADDRESS: 2Courtyard One 7500 Jefferson, NE, PHONE: 823-1000

CONTRACTOR: N/A CONTACT: _____

ADDRESS: _____ PHONE: _____

TYPE OF SUBMITTAL:

___ DRAINAGE REPORT
___ DRAINAGE PLAN
X__ CONCEPTUAL GRADING & DRAINAGE PLAN
X__ GRADING PLAN
___ EROSION CONTROL PLAN
___ ENGINEER'S CERTIFICATION
___ OTHER

PRE-DESIGN MEETINGS:

X__ YES
___ NO
___ COPY PROVIDED

CHECK TYPE OF APPROVAL SOUGHT:

_____ SKETCH PLAT APPROVAL
_____ PRELIMINARY PLAT APPROVAL
_____ S.DEV. PLAN FOR SUB'D. APPROVAL
__X__ 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
_____ S.A.D. DRAINAGE REPORT
_____ DRAINAGE REQUIREMENTS
_____ OTHER _____(SPECIFY)

DATE SUBMITTED: April 10, 2000

BY: Victoria A Dery

RECEIVED
APR 11 2000
HYDROLOGY SECTION

RECEIVED DEC 0 3 1999

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

November 30, 1999

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

RE: DRAINAGE REPORT FOR ARSENIC REMOVAL DEMO FACILITY (H-9/D11)
RECEIVED OCT 21, 1999 FOR FINAL PLAT & SITE DEV PLAN
ENGINEER'S STAMP DATED 10/20/99

Dear Mr. Brewer:

Based on the information included in the submittal referenced above, City Hydrology accepts the Drainage Report for Final Plat and Site Development Plan. The following comments must be addressed before Building Permit or Work Order:

I am concerned that the 4" outlet pipe for the pond will clog. It appears that the pond can discharge an additional 1.17 cfs. I suggest that you try a 6" pipe instead. For orifices, I typically use a C factor of 0.6 instead of 0.82. Please indicate the required pond volume at the maximum water surface elevation (MWSEL). This volume must be checked as part of the Engineer's Certification.

If I can be of further assistance, You may contact me at 768-2727.

Sincerely,

John P. Curtin, P.E.
Project Manager, PWD/Hyd

c: Inspector

RECEIVED
APR 11 2000
HYDROLOGY SECTION

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

November 30, 1999

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

RE: DRAINAGE REPORT FOR ARSENIC REMOVAL DEMO FACILITY (H-9/D11)
RECEIVED OCT 21, 1999 FOR FINAL PLAT & SITE DEV PLAN
ENGINEER'S STAMP DATED 10/20/99

Dear Mr. Brewer:

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I am concerned that the 4" outlet pipe for the pond will clog. It appears that the pond can discharge an additional 1.17 cfs. I suggest that you try a 6" pipe instead. For orifices, I typically use a C factor of 0.6 instead of 0.82. Please indicate the required pond volume at the maximum water surface elevation (MWSEL). This volume must be checked as part of the Engineer's Certification.

If I can be of further assistance, You may contact me at 768-2727.

Sincerely,

John P. Curtin, P.E.
Project Manager, PWD/Hyd

c: Inspector

THE CITY OF ALBUQUERQUE IS AN EQUAL OPPORTUNITY/REASONABLE ACCOMMODATION EMPLOYER

APPLICANT'S NAME: City of Albuquerque ZONE ATLAS/DRNG. FILE #: H-9/D011

DRB #: EPC#: CSU99-11 WORK ORDER #:

LEGAL DESCRIPTION: East 1/2 of NW1/4, Section 9, T10N, R2E

CITY ADDRESS: Approximately 3/4 mile West of Unser Blvd. along the extension of 98th Street

ENGINEERING FIRM: CH2M HILL, INC. CONTACT: Michael Brewer

ADDRESS: 6001 Indian School Rd, NE, Suite 350 Albuquerque, NM 87110 PHONE: 505/884-5600

OWNER: City of Albuquerque-PWD CONTACT: John M. Stomp, III

ADDRESS: P.O. Box 1293, Albuquerque, NM 87103 PHONE: 505/768-2562

ARCHITECT: CONTACT:

ADDRESS: PHONE:

SURVEYOR: Bohannan Huston, Inc. CONTACT: Dwain Weaver

ADDRESS: Courtyard One 7500 Jefferson, NE Albuquerque, NM 87109 PHONE: 505/823-1000

CONTRACTOR: CONTACT:

ADDRESS: PHONE:

TYPE OF SUBMITTAL:

- X DRAINAGE REPORT
- X DRAINAGE PLAN
- X CONCEPTUAL GRADING & DRAINAGE PLAN
- ___ GRADING PLAN
- ___ EROSION CONTROL PLAN
- ___ ENGINEER'S CERTIFICATION
- ___ OTHER

PRE-DESIGN MEETING:

- ___ YES
- X NO
- ___ COPY PROVIDED

CHECK TYPE OF APPROVAL SOUGHT:

- ___ SKETCH PLAT APPROVAL
- ___ PRELIMINARY PLAT APPROVAL
- ___ S. DEV. PLAN FOR SUB'D APPROVAL
- X S. DEV PLAN FOR BLDG. PERMIT APPROVAL
- ___ SECTOR PLAN APPROVAL
- X 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
- X OTHER DRB Approval/Signoff (SPECIFY)

DATE SUBMITTED: 10/21/99

BY: Michael A. Brewer

Revised 02/98

CDRA Case No. SRP5-99-36

CH2MHILL *TRANSMITTAL*

TO: City of Albuquerque
P.O. Box 1293
Albuquerque, NM 87103

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

ATTN: John P. Curtin, P.E.
Project Manager, PWD/Hyd

DATE: October 21, 1999

RE: College Reservoir Site Development - Drainage Report - **Resubmittal**

PROJECT NUMBER: 149546.03.PD

WE ARE SENDING YOU:

♦ ATTACHED	UNDER SEPARATE COVER VIA	
SHOP DRAWINGS	DOCUMENTS	TRACINGS
PRINTS	SPECIFICATIONS	CATALOGS
COPY OF LETTER	OTHER:	

QUANTITY	DESCRIPTION
2	Resubmittal of Drainage Report for The City of Albuquerque College Reservoir Site Development
2	Cover letter describing revisions and responses to City of Albuquerque and Bernalillo County comments
2	Copy of City of Albuquerque (John P. Curtin, P.E.) comments on original submittal to City of Albuquerque
2	Copy of Bernalillo County (Brad Catanach, P.E.) comments from original submittal to Bernalillo County

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

REMARKS: John-Attached for your review is two copies of the revised drainage report for the proposed development of the College Reservoir Site. The proposed Improvements consist of the construction of an Arsenic Removal Demonstration Facility and Potable Water Pump Station. Since the date of the original submittal the College Reservoir site and adjacent Westland Development lands have been annexed into the City of Albuquerque.

COPY TO: John Stomp/City of Albuquerque-PWD
Mark Schmidt/City of Albuquerque-PWD
Art Stuart/City of Albuquerque-WUD
Victorio Deery/Leedshill Herkenhoff, Inc.
Project File

RECEIVED
OCT 21 1999
HYDROLOGY SECTION

CH2M HILL, Inc.
6001 Indian School Rd., N.E.
Suite 350
Albuquerque, NM 87110 **Voice: 884-5600** **FAX: 883-7507**

CH2M HILL
6001 Indian School Road NE
Suite 350
Albuquerque, NM
87110-4140 U.S.A.
Tel 505.884.5600
Fax 505.883.7507

CH2MHILL

October 21, 1999

149546.03.PD

John P. Curtin, P.E.
City of Albuquerque
Public Works Department/Hydrology
P.O. Box 1293
Albuquerque, NM 87103

Subject: Drainage Report for Arsenic Removal Demonstration Facility,
College Reservoir (H-9/D011)

Dear John:

Attached is the revised Drainage Report (Resubmittal) for the City of Albuquerque College Reservoir Site Development. The original drainage report was submitted on July 9, 1999 for preliminary/final plat and site development plan approval. At the time of the original submittal the College Reservoir Site and adjacent lands of Westland Development, Inc. were outside the City limits and being proposed for annexation. Plat approval was under the jurisdiction of the Bernalillo County Development Review Authority and the Site Development Plan Approval under the jurisdiction of the Extraterritorial Land Use Commission. In consideration of the Authoritative jurisdiction, a subsequent submittal of the Drainage Report was made to Bernalillo County, incorporating the comments described in your letter dated August 5, 1999 (copy attached). Brad Catanach, P.E. Bernalillo County Public Works Department, reviewed the drainage submittal and provided additional comments (copy attached).

Since receipt of Mr. Catanach's comments, the annexation of the College Reservoir Site has been completed, and jurisdiction/authority now falls under the City of Albuquerque. The attached Drainage Report for the Arsenic Removal Demonstration Facility and College Pump Station has been revised to address all comments received from both the City of Albuquerque and Bernalillo County reviews. The drainage report has been revised to discuss and compare the preexisting conditions prior to the initial site development, the present site conditions as currently exists, and the proposed site development. The increased storm water runoff attributable to the existing and proposed site development will be collected in an on-site detention basin and released at a controlled rate to the Ladera Arroyo. The total discharge from the site is expected to be less than the estimated surface runoff, which occurred from the pre-1981 undeveloped natural site conditions. The detention pond has been designed to store the total runoff volume from the 100-year 6-hour storm event and to drain completely in approximately 4.25 hours at a maximum rate of 1.2-

cfs. The detention basin overflow structure is designed to convey the total volume of storm water, in excess of the 100-year 6-hour storm, directly to the Ladera Arroyo. To prevent overtopping of the detention basin, the overflow structure weir elevation and length has been designed to pass the total volume of storm water resulting from the 6-hour local storm probable maximum precipitation (PMP), taken from the City of Albuquerque DPM Section 22.2.

Sincerely,

CH2M HILL

Michael Brewer, P.E.
Project Engineer

c: John Stomp/City of Albuquerque-PWD
Mark Schmidt/City of Albuquerque-PWD
Art Stuart/City of Albuquerque-WUD
Victorio Deery/Leedshill Herkenhoff, Inc.
Project File

RECEIVED SEP 2 3 1999

County of Bernalillo

State of New Mexico

BOARD OF COUNTY COMMISSIONERS
TOM RUTHERFORD, CHAIR
DISTRICT 3
BARBARA J. SEWARD, VICE CHAIR
DISTRICT 4
KEN SANCHEZ, MEMBER
DISTRICT 1
STEVE D. GALLEGOS, MEMBER
DISTRICT 2
LES HOUSTON, MEMBER
DISTRICT 5
JUAN R. VIGIL, COUNTY MANAGER

2400 BROADWAY, S.E.
ALBUQUERQUE, NEW MEXICO 87102
PUBLIC WORKS (505) 848-1500

MARK J. CARRILLO, ASSESSOR
JUDY D. WOODWARD, CLERK
IRA ROBINSON, PROBATE JUDGE
JOE BOWDICH, SHERIFF
ORLANDO VIGIL, TREASURER

Date: 17-SEP-99

Subject: GRADING AND DRAINAGE COMMENTS

Case No: PWDN 990169

Zone Map No: H-9

Street Address: WEST OF UNSER BLVD

Legal Description: E ½ OF NW ¼ SEC 9 T10N R2E

Name of Applicant: CH2M HILL

Dear Applicant:

Department will require **TWO WEEKS for review and comment of submittal and resubmittals, and ONE WEEK for final review and plat sign-off.** Major submittals may require more than two weeks for review and comment.
The issuance of a permit or a review or approval of plan specifications, computations, and shop drawings shall not be interpreted to be a permit for or an approval of any variance or violation of any of the provisions of any county or State codes, ordinances, standards, or policies. Nor shall such issuance of a permit or approval of plans, specifications, computations, and shop drawings prevent any authorized County representative or County inspector from thereafter requiring the corrections of errors in said plans, specifications, computations, or shop drawings or from stopping construction operations which are being carried on thereunder when in violation of any County or state codes, ordinances, standards, or policies. Review of construction plans, specifications, computations, and shop drawings is only for general conformance with the design concept of the project and general compliance with the plans and specifications and shall not be construed as relieving the Contractor, Land Divider, Subdivider, Engineer/Surveyor, or applicant of the full responsibility for: providing materials, equipment, and work required by the contract; the proper fitting and construction for the work; the accuracy and completeness of the submittal; selecting fabrication processes and techniques of construction; and performing the work in a safe manner.

REV 4-22-91 BR

COUNTY OF BERNALILLO

APPLICATION FOR CASE REVIEW

Please complete pages one and two of this application for review of your case. **Submit THREE bluelines of plat, drawings, or information with case submittals and THREE bluelines of plat, drawings, or information along with the original mylar for final sign-off applications. Submit a County Zone Atlas Map with subject property marked on the map.** If a Grading and Drainage plan is not included with a land division, replat, or conceptual plan, please submit on 8.5"x11" photocopy of a USGS quad map with the subject property superimposed.

NOTE: INCOMPLETE APPLICATIONS WILL BE RETURNED WITHOUT REVIEW.

1. **APPLICANT INFORMATION:**

a. Applicant is (check one):

_X_ OWNER _____ SURVEYOR _____ AGENT
_____ ENGINEER _X_ DRAINAGE ENGINEER

b. Date of this application:_____

c. Signature of applicant:

(print)_____(sign)_____

OWNER: MARK SCHMIDT PHONE:
PUBLIC WORKS
CITY OF ALBUQUERQUE
PO BOX 1293
ALBUQUERQUE NM 87103

AGENT: CH2M HILL PHONE: 884-5600
6001 INDIAN SCHOOL RD NE #350
ALBUQUERQUE NM 87110

2. **TYPE OF SUBMITTAL (check one):**

_____ REPLAT
_____ LAND DIVISION (MINOR SUBDIVISION)
_____ MAJOR SUBDIVISION
_____ CONSTRUCTION DRAWINGS
_X_ GRADING/DRAINAGE PLAN
_____ AS-CONSTRUCTED GRADING/DRAINAGE PLAN
_____ VARIANCE REQUEST
_____ TRAFFIC IMPACT ANALYSIS/TRAFFIC STUDY
_____ INFRASTRUCTURE LIST/DESIGN REVIEW FEE

County of Bernalillo

Your : ✓ submittal of drainage information
____ resubmittal of drainage information

TO BE FILLED OUT BY COUNTY PUBLIC WORKS DIVISION ONLY

is: ____ approved.
____ approved with comments/conditions.
✓ disapproved.
____ deferred to County Floodplain Administrator.

Case review comments are:

✓ attached.
____ not attached.
____ not attached. See remarks below.

Resubmittal is:

✓ not required.
____ required. When resubmitting, please use Resubmittal Form.

Please submit:

✓ grading/drainage plan with revisions.
____ as-constructed grading/drainage plan.
____ other: _____

It is required that:

____ Bernalillo County Public Works Division inspects improvements prior to final sign-off of plat.
____ Bernalillo County Public Works Division signature line be placed on plat.

Remarks: _____

Brad Catanach 9/9/99
Brad Catanach, P.E.
Drainage Engineer
Bernalillo County Public Works Division

Comments
Development Review Engineer
AMAFCA

cc:

____ Owner: C.O.A.
____ Agent: CH2M Hill
____ Case File PWDN-990169
____ Susan Calongne, County Floodplain Administrator, COA
____ Molzen-Corbin & Associates
____ Other: _____

County of Bernalillo
Case Comments Report

Permit: PWDN-990169

Department: PDEV
Activity: (PWDRAN) PW GRADING & DRAINAGE PLAN REVIEW
Action: (PWDRAN) REVIEW GRADING & DRAINAGE COMMENTS

1. Note Date: 09-SEP-1999

Description:

Comments: 1. Existing conditions for this site should be considered 100% land treatment A.

2. Proposed basin 1 shows 1.1 acre being left undisturbed, the plan shows the entire basin being graded. Basin 1 should be reflected as land treatments C and D.

3. The allowable discharge for Basins 1 and 2 is for 100% treatment A (4.21 and 3.62 cfs respectively), Basin 2 is discharging above the allowable limit.

4. Provide an easement for the 24 inch outfall pipe to the Ladera Arroyo. Provide a detail of the orifice plate for the 24 inch pipe with supporting calculations. Also, provide a detail of the outlet structure in the Ladera Arroyo.

5. Provide pond capacity calculations; if the detention pond is sized for a 6-hour storm then it must drain in 6 hours (a stage storage pond routing calculation would be useful with the next submittal). The proposed grading for basin 1 does not concentrate the flows to the rundown.

6. Basin 1 is not graded to reflect all of the flows being directed towards the detention pond.

7. Show proposed grading for the future 5 mg reservoir.

8. Provide the standard engineer's site inspection statement in regards to a site visit by the engineer and the topography being accurate.

9. Provide a FEMA map showing the site location in regards to mapped floodplains.

AMAFCA COMMENTS:
10. What is the flow velocity for existing and proposed conditions.

11. It is not clear if the outfall structure to the Ladera Arroyo is proposed or existing.

Date: 17-SEP-1999

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

August 5, 1999

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

RE: DRAINAGE REPORT FOR ARSENIC REMOVAL DEMO FACILITY, COLLEGE RESERVOIR (H-9/D011); RECEIVED JULY 9,1999 FOR PRELIMINARY & FINAL PLAT, SITE DEV PLAN; ENGINEER'S STAMP DATED 7/8/99

Dear Mr. Brewer:

Based on the information included in the submittal referenced above, City Hydrology accepts the concept for Preliminary Plat and Site Development Plan. The following comments must be addressed before Building Permit, Work Order or Final Plat:

Retention ponds must be designed to store the 100 year, 10 day storm volume per the Mayor's Emergency Rule published 5-14-91 (attached). Indicate the location and details of the emergency spillway. It appears that the retention pond could be converted into a detention pond by using the washwater line as an outlet. It is recommended that the total discharge from the site be limited to 12.3 cfs. Add erosion control notes to the Grading & Drainage Plan.

If I can be of further assistance, You may contact me at 768-2727.

Sincerely,

John P. Curtin, P.E.
Project Manager, PWD/Hyd

c: Inspector

THE CITY OF ALBUQUERQUE IS AN EQUAL OPPORTUNITY/REASONABLE ACCOMMODATION EMPLOYER

DRAINAGE INFORMATION SHEET

APPLICANT'S NAME: City of Albuquerque ZONE ATLAS/DRNG. FILE #: H-9 DoV

DRB #: _____ EPC#: CSU99-11 WORK ORDER #: _____

LEGAL DESCRIPTION: East 1/2 of NW1/4, Section 9, T10N, R2E

CITY ADDRESS: Approximately 3/4 mile West of Unser Blvd. along the extension of 98th Street

ENGINEERING FIRM: CH2M HILL, INC. CONTACT: Michael Brewer

ADDRESS: 6001 Indian School Rd, NE, Suite 350 Albuquerque, NM 87110 PHONE: 505/884-5600

OWNER: City of Albuquerque-PWD CONTACT: John M. Stomp, III

ADDRESS: P.O. Box 1293, Albuquerque, NM 87103 PHONE: 505/768-2562

ARCHITECT: _____ CONTACT: _____

ADDRESS: _____ PHONE: _____

SURVEYOR: Bohannan Huston, Inc. CONTACT: Dwain Weaver

ADDRESS: Courtyard One 7500 Jefferson, NE Albuquerque, NM 87109 PHONE: 505/823-1000

CONTRACTOR: _____ CONTACT: _____

ADDRESS: _____ PHONE: _____

TYPE OF SUBMITTAL:

- X DRAINAGE REPORT
- ___ DRAINAGE PLAN
- X CONCEPTUAL GRADING & DRAINAGE PLAN
- ___ GRADING PLAN
- ___ EROSION CONTROL PLAN
- ___ ENGINEER'S CERTIFICATION
- ___ OTHER _____

PRE-DESIGN MEETING:

- ___ YES
- X NO
- ___ COPY PROVIDED

CHECK TYPE OF APPROVAL SOUGHT:

- ___ SKETCH PLAT APPROVAL
- X PRELIMINARY PLAT APPROVAL
- X S. DEV. PLAN FOR SUB'D APPROVAL
- X S. DEV PLAN FOR BLDG. PERMIT APPROVAL
- ___ SECTOR PLAN APPROVAL
- X 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
- X OTHER DRB Approval/Signoff (SPECIFY)

DATE SUBMITTED: 7/8/99

BY: Michael Brewer

RECEIVED
JUL 09 1999
HYDROLOGY SECTION

Revised 02/98

CDRA Case No. SRP5-99-36

H-9/D07

CH2MHILL *TRANSMITTAL*

TO: City of Albuquerque

Albuquerque, NM

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

ATTN: Fred Aguirre, P.E.

DATE: July 9, 1999

RE: College Reservoir Site Development - Drainage Report

PROJECT NUMBER: 149546.03.PD

WE ARE SENDING YOU:

♦ ATTACHED	UNDER SEPARATE COVER VIA	
SHOP DRAWINGS	DOCUMENTS	TRACINGS
PRINTS	SPECIFICATIONS	CATALOGS
COPY OF LETTER	OTHER:	

QUANTITY	DESCRIPTION
2	Drainage Report for The City of Albuquerque College Reservoir Site Development

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

REMARKS: Fred-Attached for your review is two copies of the drainage report for the proposed development of the College Reservoir Site. The proposed Improvements consist of the construction of an Arsenic Removal Demonstration Facility and Potable Water Pump Station. We met several months ago and briefly discussed this site. The College Reservoir site is located within the unplatted lands of the Town of Atrisco Grant, west of Unser Blvd. The ELUC and CDRA are hearing the case for subdivision approval (it was never platted) and site development plan approval. The lands south and east of the site are owned by Westland Development Corp. and included in the planned annexation. Per our previous discussion it is proposed that the site drainage plan maintain the historic status quo in regards to surface runoff.

COPY TO: John Stomp/City of Albuquerque-PWD
Mark Schmidt/City of Albuquerque-PWD
Art Stuart/City of Albuquerque-WUD
Victorio Deery/Leedshill Herkenhoff, Inc.
Project File

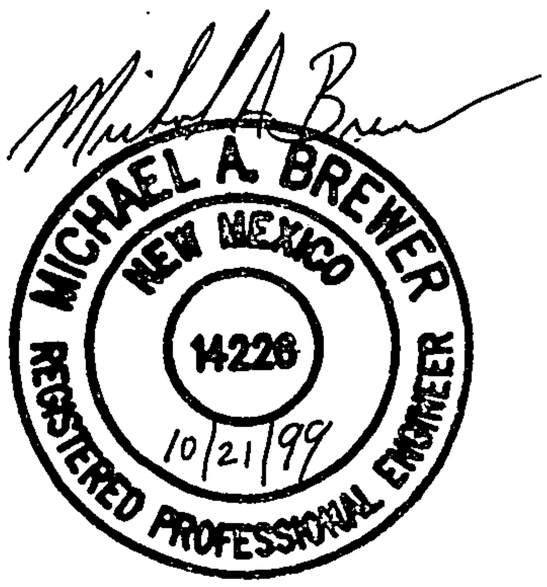
RECEIVED
JUL 0 9 1999
HYDROLOGY SECTION

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

ARSENIC REMOVAL DEMONSTRATION FACILITY AND COLLEGE PUMP STATION

DRAINAGE REPORT
FOR COLLEGE RESERVOIR SITE



The following items concerning the College Reservoir site grading and drainage improvements are contained herein:

- Vicinity Map
- 100-Year Flood Plane Locations
- Site Grading and Drainage Plan for the Existing and Proposed Improvements at the College Reservoir Site
- Storm Water Runoff Calculations
- Proposed landscaping Plan

The location of the proposed improvements, Arsenic Removal Demonstration Facility and College Pump Station, are to the north and east of the existing College Reservoir. The

College Reservoir site is located west of Unser Blvd. and north of 98th Street, as shown on the Site Vicinity Map (Attachment A). Access to the site is via an existing utility and access easement from 98th Street. The proposed improvements to the site include the construction of an Arsenic Removal Demonstration Facility, Potable Water Pumping Station, associated piping and appurtenances, site grading, storm drainage modifications, and landscaping.

The runoff calculations (see Attachment C) analyze the preexisting, existing and fully developed conditions for the 100-year, 6-hour rainfall event for the entire College Reservoir site. 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 100-Year Flood Plane Map (Attachment B), this site does not lie within a designated flood hazard area. Due to the fact that this property is located within and adjacent to existing undeveloped lands it would not be expected to contribute runoff to an existing flooding problem. Runoff flows, from the developed areas of the site, will be collected and diverted to a new storm water detention pond constructed at the northeast corner of the site. The proposed site hydrology and surface runoff volumes are anticipated to generally maintain the historic status quo for the site drainage and surface runoff.

PreExisting Site Conditions

The College site is situated within the East ½ of the NW ¼, Section 9, T10N, R2,E and comprises an area of approximately 6.07 acres. The preexisting site topography, prior to the existing site developments, is shown in Attachment D. Runoff from the site historically drained via sheetflow from southwest to northeast into the Ladera Arroyo. The preexisting site hydrology and surface configuration contributed an estimated runoff of 7.70-cfs to the Ladera Arroyo.

Existing Conditions

The existing College Reservoir site comprises an area of approximately 6.07 acres. Currently, the site is partially developed with the construction of a 5.0 million-gallon, above ground steel reservoir, well pump building and paved site access road. The existing development divides the site into two drainage basins, defined by the developed improvements and the existing topography, as shown on attachment E. Drainage Basin 1 covers an area of approximately 2.49 acres and includes the developed portions of the site. Surface runoff, from Basin 1, is routed to an existing on-site storm water retention pond. Basin 2 encompasses the undeveloped portions of the site, totaling an area of approximately 3.58 acres. Surface runoff, from Basin 2, flows generally to the north and east across the adjacent undeveloped land and into the existing Ladera Arroyo. The existing site hydrology and surface configuration contributes an estimated runoff of 5.99-cfs to the Ladera Arroyo. 6.32-cfs is retained on the site. The existing reservoir overflow and well washwater are piped to a concrete outlet structure and discharged directly into the Ladera Arroyo. Details of the existing concrete outfall structure are shown in the Appendix.

Proposed Improvements

The proposed improvements will consist of the construction of an Arsenic Removal Demonstration Facility (8600 S.F.), a new Water Pumping Facility (2950 S.F.), a future 5.0 million gallon, above ground steel reservoir, associated underground utilities and appurtenances, site grading, and landscaping, as shown on Attachment F.

The College Reservoir site will be regraded such that all surface runoff, originating from the developed areas of the site (Basin 1 totaling 3.26 acres), will be collected and conveyed to a new storm water detention pond at the northeast corner of the site. The new storm water detention pond is designed to collect and temporarily hold the total runoff volume from Basin 1, for the 100-year 6-hour storm event. Surface runoff from the undeveloped portion of the site (Basin 2 totaling 2.81 acres) will continue to flow to the north and east across the adjacent undeveloped land and into the existing Ladera Arroyo. The proposed site hydrology and surface configuration would contribute a maximum runoff of 6.53-cfs to the Ladera Arroyo.

The existing and future reservoir overflows and well washwater will continue to be piped to the concrete outlet structure and discharged directly into the Ladera Arroyo.

Storm Water Detention Pond

A new Storm Water Detention Pond will be constructed at the northeast corner of the site and sized to contain the full 100-year, 6-hour rainfall volume, 15,282 ft^3. The pond will be designed and constructed to provide one-foot 3-inches of freeboard (6,822ft^3 excess capacity) along with an emergency overflow structure to convey storm water volumes in excess of the 100-year, 6-hour event, directly to the Ladera Arroyo. The emergency overflow structure, as shown in Attachment H, will include an inlet port located at the bottom of pond elevation to provide a controlled release of the storm water volume collected from Basin 1. Runoff collected in the new storm water detention pond will be released to the Ladera Arroyo at a controlled rate of approximately 1.2-cfs, which will fully drain the detention pond within 4.25 hours.

Also attached for informational purposes is Attachment G— Proposed Landscaping Plan for the College Reservoir Site.

Existing Concrete Outfall Structure at Ladera Arroyo

The existing development of the College site, completed in March 1981, included the construction of a concrete headwall structure at the south bank of the Ladera Arroyo. This outfall structure is used to convey well washwater from College Well No. 1 and overflow from the College Reservoir to the Ladera Arroyo. Original design drawings for this structure along with the erosion control improvements are included in the Appendix. The College Well No. 1 discharges washwater to the Ladera Arroyo at the beginning and end of each pumping cycle. The well washwater is discharged into the Ladera Arroyo at a rate of 1680 gallons-per-minute (3.74 feet-per-second). There are no visible impacts, of this point

discharge, on the Ladera Arroyo from an erosion aspect. This is illustrated in the photographs included in the Appendix. The photographs clearly show no erosion or cutting away of the arroyo banks downstream (east) of the concrete headwall structure. The only erosion and undercutting of the arroyo banks is present on the upstream (west) side of the concrete headwall structure. The wire enclosed riprap, constructed around the outfall structure, has remained intact since it's initial construction and continues to provide protection to the existing Ladera Arroyo channel from discharges originating from the College Reservoir site.

The storm water discharged from the proposed detention basin will be limited to a maximum rate of 1.20-cfs, which is much less than the washwater rate of 3.74-cfs currently being discharged to the Ladera Arroyo.

Erosion Control Measures

Temporary Erosion Control Measures During Construction: During the rough grading, placement of structural fill and construction of the storm sewer improvements and the new detention pond, erosion of soil from the site will controlled by the installation of temporary silt fencing along the north and east property lines. The contractor will be required to construct and maintain the temporary silt fencing to prevent the erosion of soil from the site and into the existing Ladera Arroyo. The contractor will also be required to provide dust abatement measures to prevent air born transport of soil particles during construction activities, including all cut and fill areas as well as haul roads and site access road.

Permanent Erosion Control Measures After Construction: Upon completion of the proposed improvements all areas of the site, including haul roads and exterior sloped surfaces of the detention pond shall be reseeded with reclamation seed mix. The reclamation seed mix shall be provided and installed as specified in Section 1012 "NATIVE GRASS SEEDING" of the City of Albuquerque Standard Specifications for Public Works Construction. The inlet rundown channel to the detention pond will be lined with grouted riprap. The bottom and interior slopes of the detention pond will be lined with wire enclosed riprap materials.

Attachments

A.	Site Vicinity Map
B.	100 Year Flood Plane Map, showing location of the College Reservoir site
C.	Calculations on existing and proposed runoff flow and volume
D.	Preexisting Site Topography
E.	Existing Site Grading and Drainage Plan for the College Reservoir Site
F.	Proposed Site Grading and Drainage Plan for the Fully Developed College Reservoir Site
G.	Proposed Landscaping Plan for the College Reservoir Site
H.	Storm Water detention Pond Emergency Overflow Structure
Appendix	Existing Ladera Arroyo Concrete Outlet Structure

Escarpment Plan Conservation Area

Escarpment Plan Conservation Area

Petroglyph National Monument

TOWN OF ATRISCO GRANT

COLLEGE RESERVOIR SITE

EL RANCHO ATRISCO PHASE V SECTOR DEV PLAN BOUNDARY

TOWN OF ATRISCO GRANT

LAURELWOOD 2

R-D

EL RANCHO ATRISCO PHASE II / PHASE III SECTOR DEV PLAN BOUNDARY

EL RANCHO ATRISCO PHASE 2

SU-1 PUBLIC UTILITIES

TOWN OF ATRISCO GRANT

LADERA

UNSER

98TH

ST

LAS LOMITAS (UNIT 2A)

LAS LOMITAS (UNIT 2B)

EL RANCHO ATRISCO PHASE IV SECTOR DEV PLAN BOUNDARY

INDUSTRIAL CENTER

SU-1 LIGHT INDUST

LADERA CHANNEL

PHASE 5

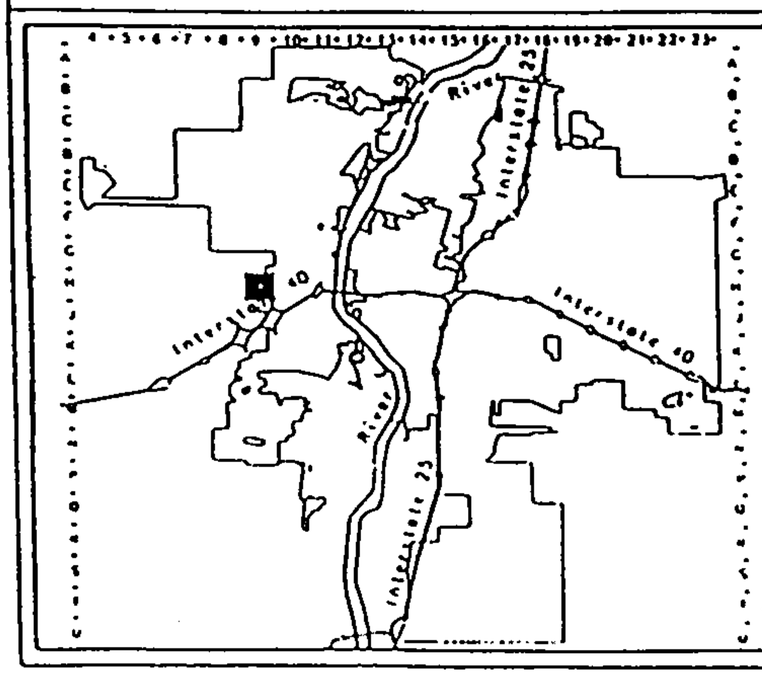
DR

PARKWAY

BLVD

EL RANCHO ATRIS

PHASE 3



North

750 375 0 750

Scale 1" = 750'

A Municipal Geographic Information System

City of Albuquerque

© Planning Department July 03, 1993

LEGAL DESCRIPTION

T10N

R2E

SEC 9

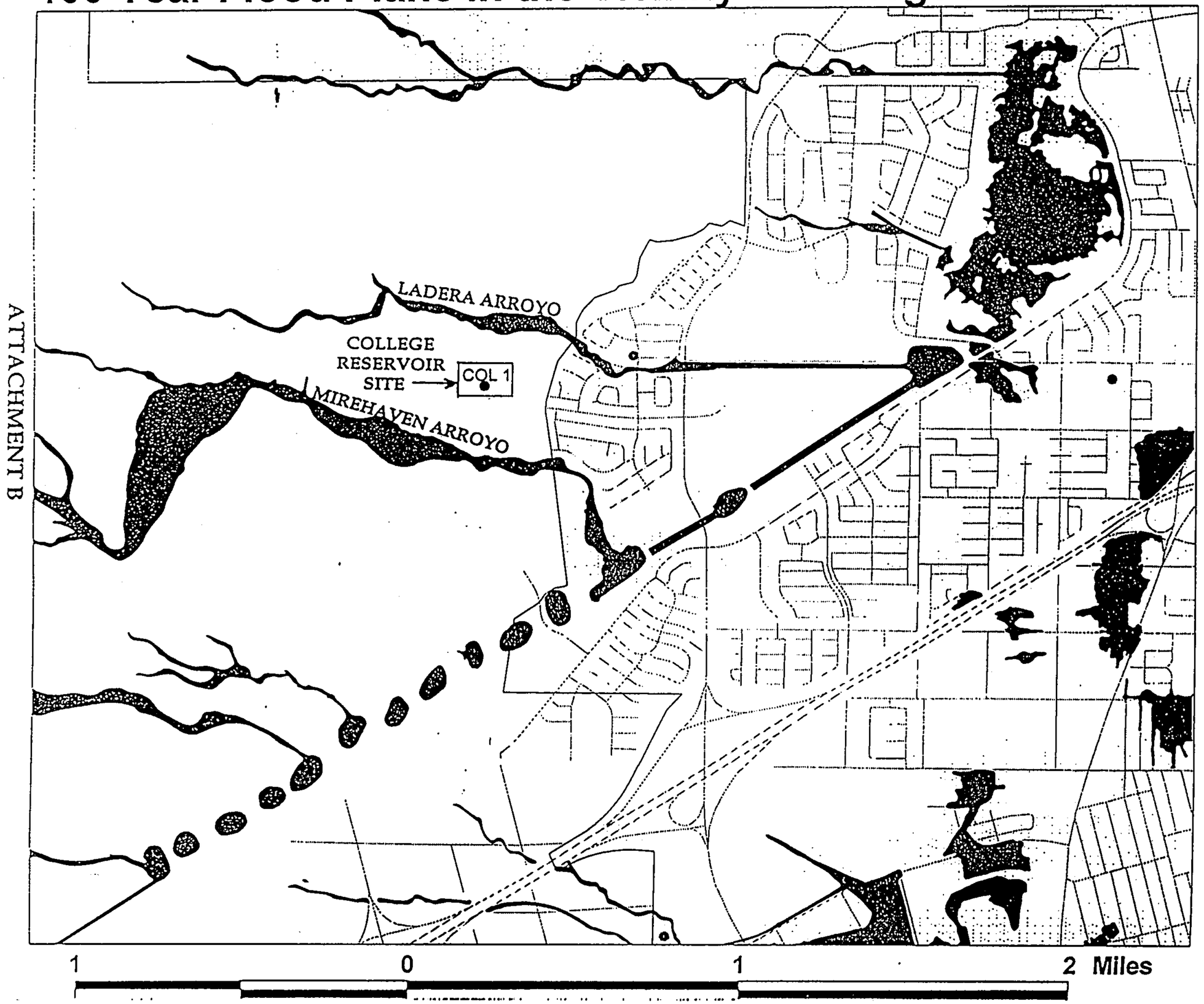
UNIFORM PROPERTY CODE

1 009 059

H-9-Z

ATTACHMENT A

100 Year Flood Plane in the Vicinity of College Reservoir Site



ATTACHMENT C

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 19 Soil Type for This Site is: **BKD – Bluepoint-Kokan Association, Hilly – Gravelly, loamy, fine sand**

Hydrologic Soil Group: **A**

From DPM Section 22.2 Table A-1: Precipitation Zone for this site is **Zone 1** (West of the Rio Grande)

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 = **2.20 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 = **4.70 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)

PreExisting Conditions

Site Data

Drainage Basin	Land Treatments	Area (acres)	Runoff Coefficient (C)	Excess Precipitation (E)
1	Undeveloped Area, Native grasses, weeds, 0-10% slope (Treatment A)	6.07	0.27	0.44
1	Undeveloped Area, Native grasses, weeds, 10%<20% slope (Treatment B)	0.00	0.43	0.67
1	Compacted Area, minimal vegetation, unpaved roads, gravel (Treatment C)	0.00	0.61	0.99
1	Impervious areas, pavement and roofs (Treatment D)	0.00	0.93	1.97

Total Area = 6.07 ac.

Preexisting Runoff Volumes – Total area=6.07 ac.

$Q_{100} = \Sigma(CiA) = (.27)(4.70)(6.07) +(.43)(4.70)(0.00) + (.61)(4.70)(0.00) + (.93)(4.70)(0.00)$

$Q_{100} = 7.70$ cfs

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

$V_{100} = 3630 \times \Sigma(E \times A) = 3630\ [(0.44)(6.07) + (0.67)(0.00) + (0.99)(0.00) + (1.97)(0.00)] = 9{,}695$ cf

Existing Developed Conditions

Site Data

Drainage Basin	Land Treatments	Area (acres)	Runoff Coefficient (C)	Excess Precipitation (E)
1	Undeveloped Area, Native grasses, weeds, 0-10% slope (Treatment A)	1.14	0.27	0.44
1	Undeveloped Area, Native grasses, weeds, 10%<20% slope (Treatment B)	0.41	0.43	0.67
1	Compacted Area, minimal vegetation, unpaved roads, gravel (Treatment C)	0.04	0.61	0.99
1	Impervious areas, pavement and roofs (Treatment D)	0.90	0.93	1.97
2	Undeveloped Area, Native grasses, weeds, 0-10% slope (Treatment A)	2.36	0.27	0.44
2	Undeveloped Area, Native grasses, weeds, 10%<20% slope (Treatment B)	0.74	0.43	0.67
2	Compacted Area, minimal vegetation, unpaved roads, gravel (Treatment C)	0.40	0.61	0.99
2	Impervious areas, pavement and roofs (Treatment D)	0.08	0.93	1.97

Total Area = 6.07 ac.

Drainage Basin 1 (Runoff Retained on-site) – Total area=2.49 ac.

$Q_{100} = \Sigma(CiA) = (.27)(4.70)(1.14) + (.43)(4.70)(0.41) + (.61)(4.70)(0.04) + (.93)(4.70)(0.90)$

$Q_{100} = 6.32$ cfs

Area impervious = 0.90 ac.: % impervious = 36.1%

$V_{100} = 3630 \times \Sigma(E \times A) = 3630\ [(0.44)(1.14) + (0.67)(0.41) + (0.99)(0.04) + (1.97)(0.90)] = 9{,}398$ cf

Drainage Basin 2 (Runoff flows off-site) – Total area=3.58 ac.

$Q_{100} = \Sigma(CiA) = (.27)(4.70)(2.36) + (.43)(4.70)(0.74) + (.61)(4.70)(0.40) + (.93)(4.70)(0.08)$

$Q_{100} = 5.99$ cfs

Area impervious = 0.08 ac.: % impervious = 2.2%

$V_{100} = 3630 \times \Sigma(E \times A) = 3630\ [(0.44)(2.36) + (0.67)(0.74) + (0.99)(0.40) + (1.97)(0.08)] = 7{,}579$ cf

Fully Developed Conditions

Site Data

Drainage Basin	Land Treatments	Area (acres)	Runoff Coefficient (C)	Excess Precipitation (E)
1	Undeveloped Area, Native grasses, weeds, 0-10% slope (Treatment A)	1.10	0.27	0.44
1	Undeveloped Area, Native grasses, weeds, 10%<20% slope (Treatment B)	0.00	0.43	0.67
1	Compacted Area, minimal vegetation, unpaved roads, gravel (Treatment C)	0.52	0.61	0.99
1	Impervious areas, pavement and roofs (Treatment D)	1.63	0.93	1.97
2	Undeveloped Area, Native grasses, weeds, 0-10% slope (Treatment A)	1.97	0.27	0.44
2	Undeveloped Area, Native grasses, weeds, 10%<20% slope (Treatment B)	0.00	0.43	0.67
2	Compacted Area, minimal vegetation, unpaved roads, gravel (Treatment C)	0.59	0.61	0.99
2	Impervious areas, pavement and roofs (Treatment D)	0.26	0.93	1.97

Total Area = 6.07 ac.

Drainage Basin 1 (Runoff Detained on-site) – Total area=3.26 ac.

$Q_{100} = \Sigma(CiA) = (.27)(4.70)(1.10) +(.43)(4.70)(0.00) + (.61)(4.70)(0.52) + (.93)(4.70)(1.63)$

Q_{100} = 10.01 cfs

Area impervious = 1.63 ac.: % impervious = 50.0%

$V_{100} = 3630\ [(0.44)(1.10) + (0.67)(0.00) + (0.99)(0.52) + (1.97)(1.63)]$= 15,282 cf

Drainage Basin 2 (Runoff flows off-site) – Total area=2.81 ac.

$Q_{100} = \Sigma(CiA) = (.27)(4.70)(1.97) +(.43)(4.70)(0.00) + (.61)(4.70)(0.59) + (.93)(4.70)(0.26)$

Q_{100} = 5.33 cfs

Area impervious = 0.26 ac.: % impervious = 9.3%

$V_{100} = 3630\ [(0.44)(1.97) + (0.67)(0.00) + (0.99)(0.59) + (1.97)(0.26)]$= 7,126 cf

Storm Water Detention Pond

The new storm water detention pond has been sized to collect and store the total runoff volume of 15,282 CF, from Basin 1, for the 100-year 6-hour storm event. The top of the storm water detention pond will be constructed at an elevation 1.25-feet above the weir elevation of the emergency overflow structure, providing 1.25-feet of freeboard in the detention basin. The emergency overflow structure (see attachment H) will covey all runoff volumes in excess of the 100-year 6-hour storm event directly to the Ladera Arroyo through the existing 24-inch RCP reservoir overflow/drain line. The drainage rate of the detention pond will be controlled off the soffit elevation of the drain orifice opening in the emergency overflow structure. The difference between the weir elevation of the emergency overflow and the soffit elevation of the 4-inch drain orifice (short tube) results in a maximum available head of 4-foot 5-inches. This will allow a maximum discharge rate, from the detention pond to the Ladera Arroyo, of 1.20-cfs as follows:

$$Q = Cd\ A\ (2g\ H)^{.5}$$
$$Q = 0.82 \times 0.087\ (64.4 \times 4.42)^{.5} = 1.20\text{-cfs}$$

The draining of the detention pond will contribute a maximum of 1.2-cfs to the Ladera Arroyo and will drain the 100-year 6-hour storm volume completely in 4.25 hours. Pond volume and time to drain calculations are shown on page 6 of Attachment C.

The emergency overflow structure, shown in attachment H, is designed to accept the 6-hour local storm probable maximum precipitation (PMP) for the Albuquerque/Bernalillo County Zone Atlas Grid H-9. From the City of Albuquerque DPM Section 22.2 Figure D-5, the PMP_{360} is estimated to be 12.25-inches.

$$Q_{(PMP_{360})} = \Sigma(CiA) = (.27)(12.25)(1.10) + (.43)(12.25)(0.00) + (.61)(12.25)(0.52) + (.93)(12.25)(1.63)$$
$$Q_{(PMP_{360})} = 26.09\ \text{cfs}$$

The emergency overflow structure, shown in attachment H, provides a total weir length of 16-feet. The overflow weir acts as a broadcrested weir without end constrictions. The submergence depth of the overflow weir to discharge the 26.09-cfs is 0.62-feet. Assuming a 7.5-inch submergence depth, the capacity of the overflow weir is 26.33-cfs as follows:

$$Q = 3.33 \times L \times H^{1.5}$$
$$Q = 3.33 \times 16 \times 0.625^{1.5} = 26.33\ \text{cfs} > 26.09\ \text{cfs for } Q_{(PMP_{360})}.$$

Try 6" ϕ Pipe

$A = \pi (.25')^2 = 0.1963$ sf

$h = 13.75 - 9.25 = 4.5'$

$Q = 0.6\ (0.1963)\sqrt{64.4(4.5')}$

$= 2.0$ cfs

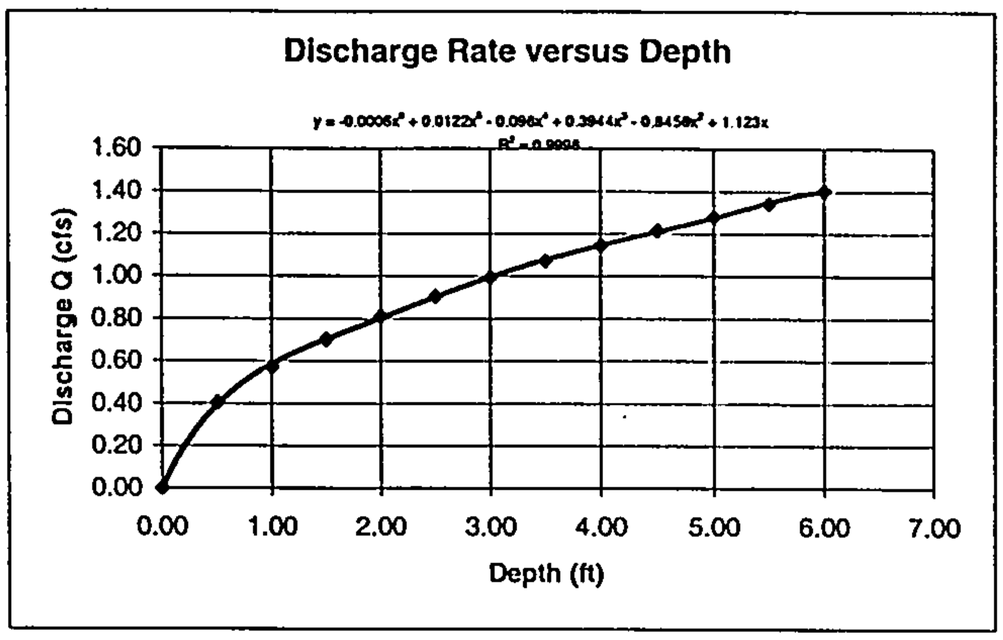
Detention Pond Design Calculations

Orifice discharge rate versus head

$Q=C_d \times A \times (2gxH)^{0.5}$ Orifice Equation

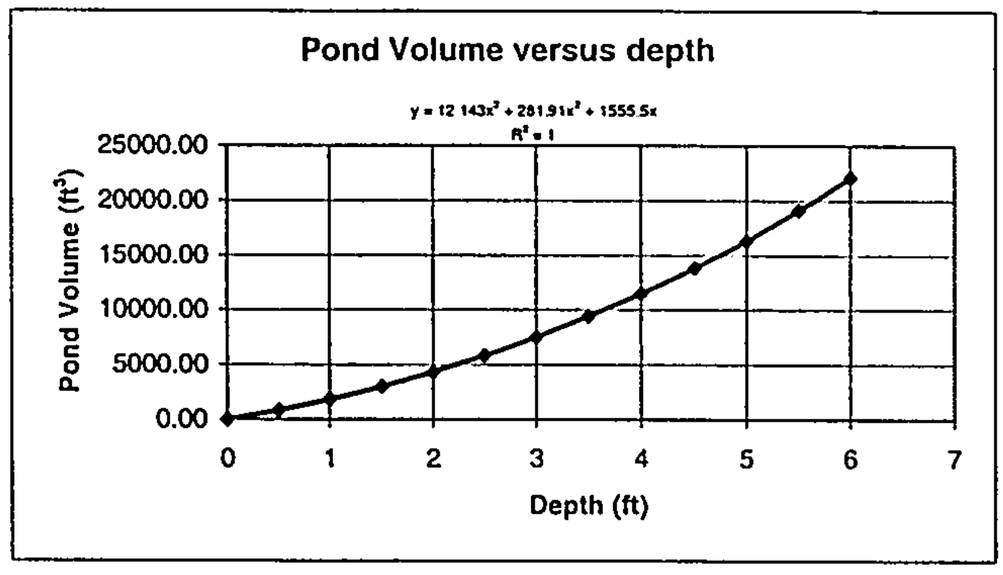
where: Q=discharge rate(cfs)
C_d=discharge coefficient
A=area of orifice opening
H=head, feet

H	C_d	A	$(2gxH)^{0.5}$	Q
0.00	0.82	0.09	0.00	0.00
0.50	0.82	0.09	5.67	0.40
1.00	0.82	0.09	8.02	0.57
1.50	0.82	0.09	9.83	0.70
2.00	0.82	0.09	11.35	0.81
2.50	0.82	0.09	12.69	0.91
3.00	0.82	0.09	13.90	0.99
3.50	0.82	0.09	15.01	1.07
4.00	0.82	0.09	16.05	1.15
4.50	0.82	0.09	17.02	1.21
5.00	0.82	0.09	17.94	1.28
5.50	0.82	0.09	18.82	1.34
6.00	0.82	0.09	19.66	1.40



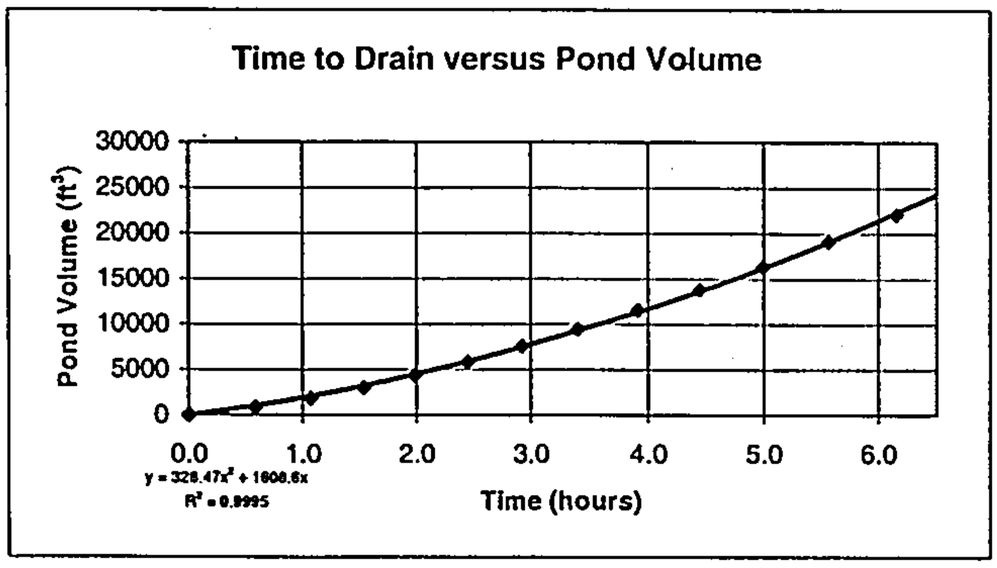
Pond Volume as Function of Depth

depth	area 1	area 2	volume 1	Volume 2	pond volume
0.00	1564.00	1560.00	0.00	0.00	0.00
0.50	1564.00	1842.00	782.00	69.50	851.50
1.00	1564.00	2136.00	1564.00	286.00	1850.00
1.50	1564.00	2447.00	2346.00	662.25	3008.25
2.00	1564.00	2771.00	3128.00	1207.00	4335.00
2.50	1564.00	3108.00	3910.00	1930.00	5840.00
3.00	1564.00	3457.00	4692.00	2839.50	7531.50
3.50	1564.00	3818.00	5474.00	3944.50	9418.50
4.00	1564.00	4191.00	6256.00	5254.00	11510.00
4.50	1564.00	4576.00	7038.00	6777.00	13815.00
5.00	1564.00	4973.00	7820.00	8522.50	16342.50
5.50	1564.00	5383.00	8602.00	10502.25	19104.25
6.00	1564.00	5804.00	9384.00	12720.00	22104.00



Time to Drain as Function of Pond Volume

Pond Water Depth	Pond Volume (ft^3)	Average Discharge Rate	Change in Pond Volume	Elapsed Time Seconds	Elapsed Time Hours
0.00	0.00	0.00		0.00	0.00
0.50	851.50	0.40	851.50	2103.41	0.58
1.00	1850.00	0.57	998.50	3847.51	1.07
1.50	3008.25	0.70	1158.25	5499.40	1.53
2.00	4335.00	0.81	1326.75	7138.09	1.98
2.50	5840.00	0.91	1505.00	8800.70	2.44
3.00	7531.50	0.99	1691.50	10506.53	2.92
3.50	9418.50	1.07	1887.00	12268.35	3.41
4.00	11510.00	1.15	2091.50	14094.99	3.92
4.50	13815.00	1.21	2305.00	15992.96	4.44
5.00	16342.50	1.28	2527.50	17967.33	4.99
5.50	19104.25	1.34	2761.75	20024.30	5.56
6.00	22104.00	1.40	2999.75	22163.41	6.16



Summary and Comparison

Drainage Basin 1 (Runoff Detained on-site)

Q_{100} = 10.01 cfs

V_{100} = 15,282 cf

Temporary Storage Volume Required	= 15,282 cf
Temporary Storage Volume Provided	= 22,104 cf
Excess Storage Volume Provided	= 6,822 cf
Maximum Rate of release from Detention Basin to Ladera Arroyo	= 1.20 cfs

Drainage Basin 2 (Runoff flows off-site)

Q_{100} = 5.33 cfs

V_{100} = 7,126 cf

Total Site Runoff

Change in Q_{100} from the PreExisting conditions (sheetflow to Ladera Arroyo)

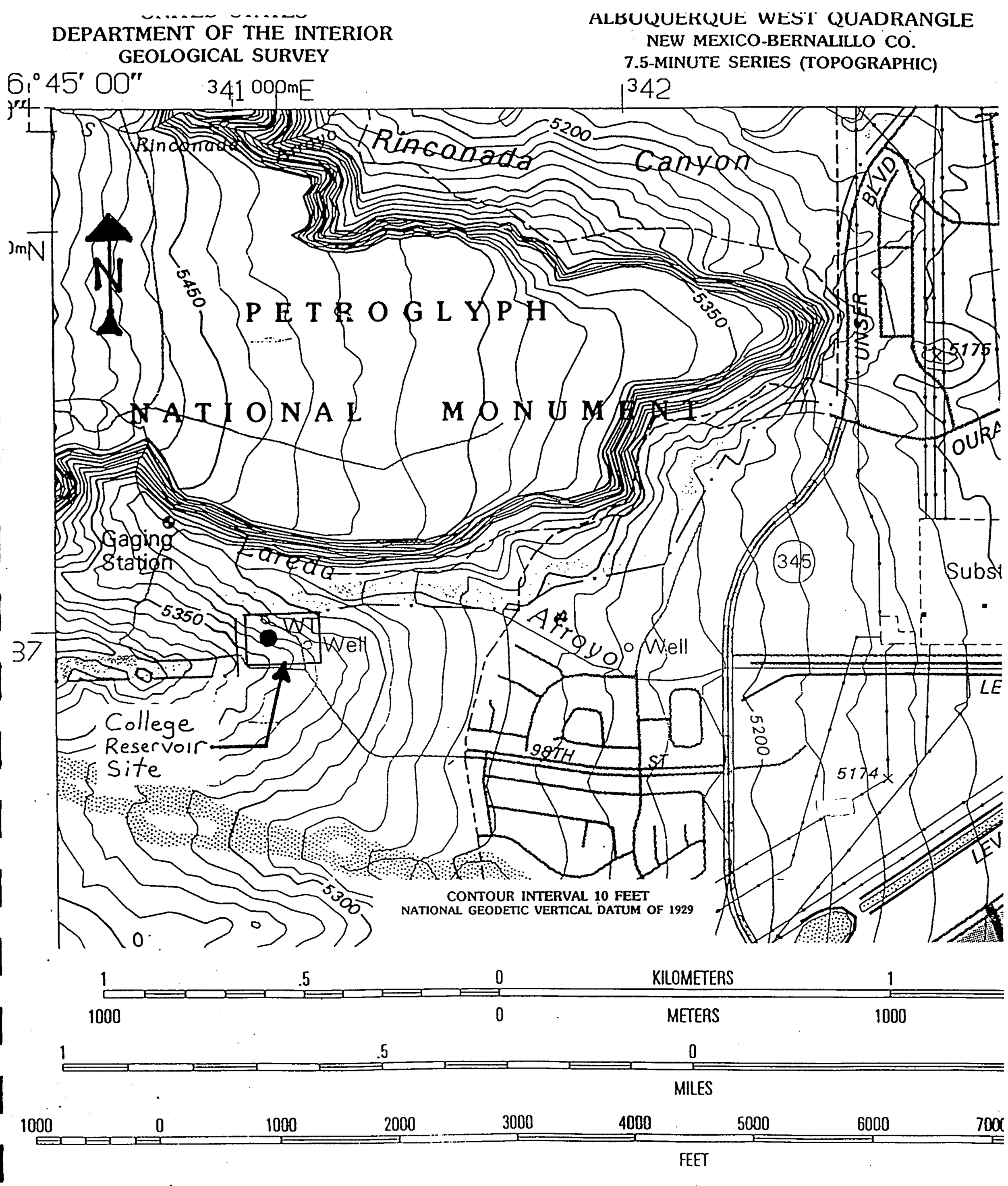
= 5.33 cfs (fully developed) – 7.70 cfs (PreExisting) = -2.37 cfs (**decrease**)

Change in Q_{100} from the PreExisting conditions (point discharge to the Ladera Arroyo)

= 1.20 cfs (**increase**)

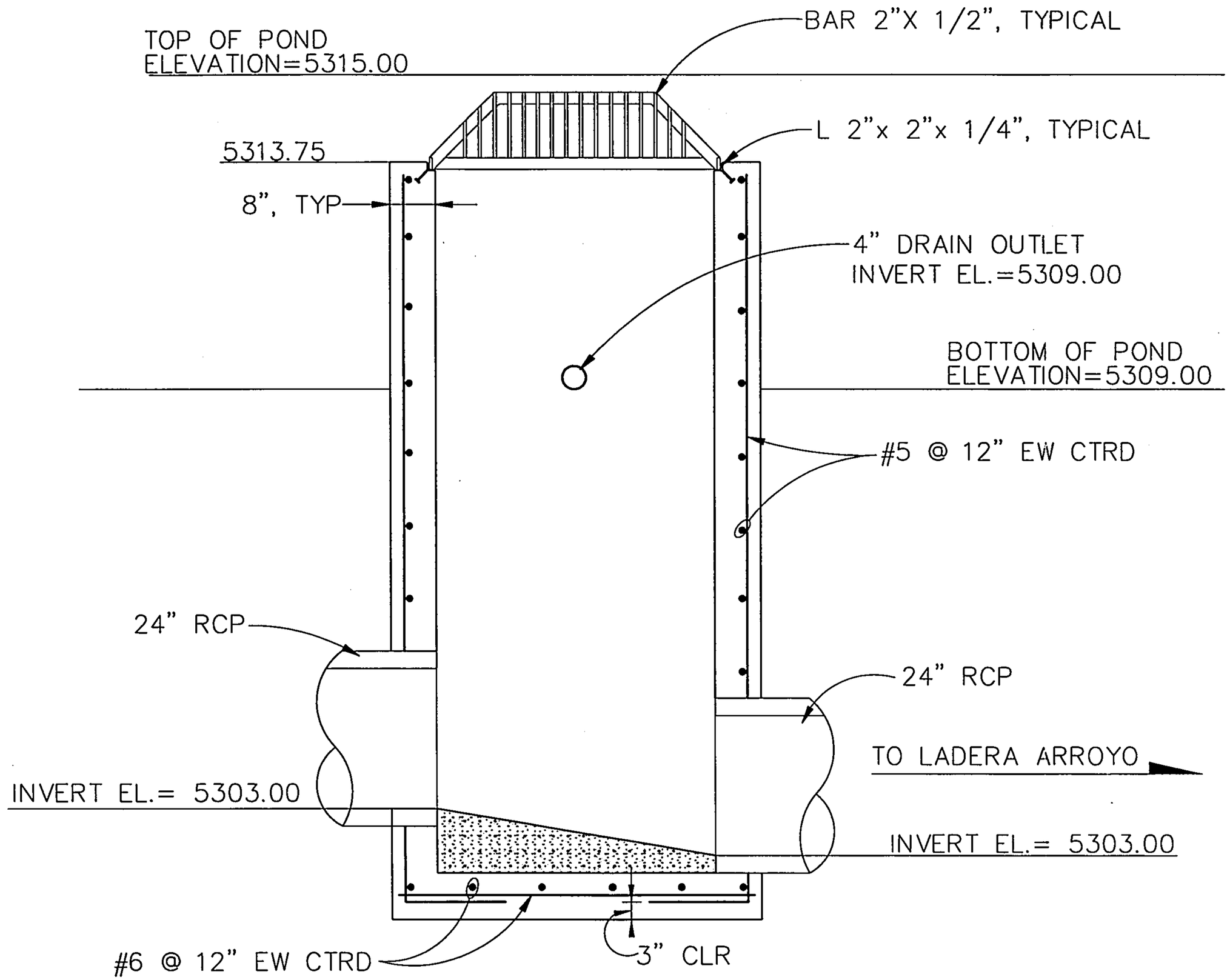
Total net change in site runoff to the Ladera Arroyo from PreExisting conditions

= 5.33 cfs +1.20 cfs (fully developed) – 7.70 cfs (PreExisting) = -1.17 cfs (**decrease**)

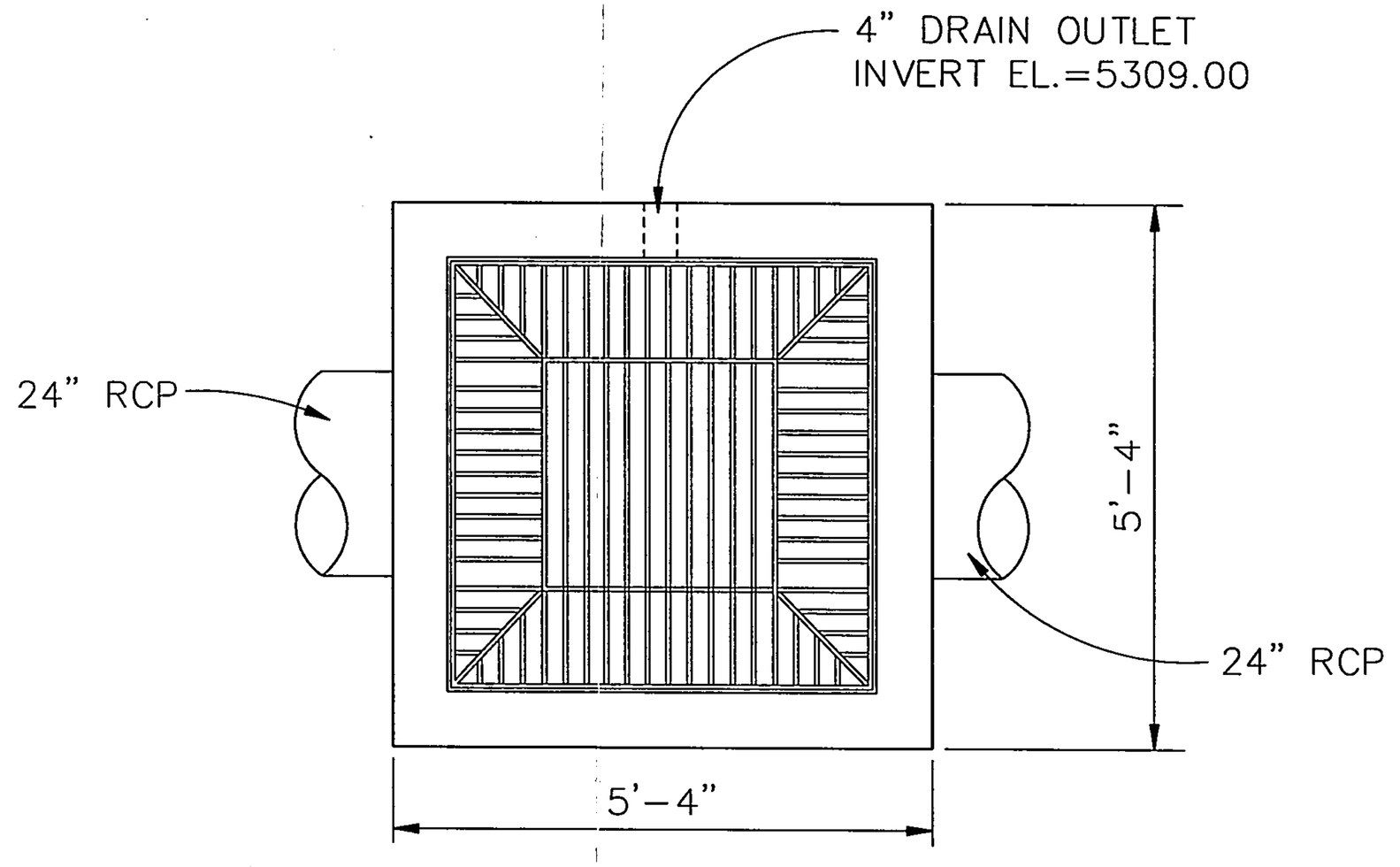


ATTACHMENT D

PREEXISTING SITE TOPOGRAPHY



SECTION



TOP PLAN

STORM WATER DETENTION POND
EMERGENCY OVERFLOW STRUCTURE
SCALE: 1/2"= 1'-0"

ATTACHMENT H

ATTACHMENT_H.DWG

CH2MHILL

Arsenic Removal Demonstration Facility and College Pump Station Drainage Report

APPENDIX

EXISTING CONCRETE OUTFALL STRUCTURE

AT LADERA ARROYO

Existing concrete headwall structure at south bank of the Ladera Arroyo (looking south).

Existing concrete headwall structure at south bank of the Ladera Arroyo (looking south).

Existing concrete headwall structure at south bank of the Ladera Arroyo (looking north).

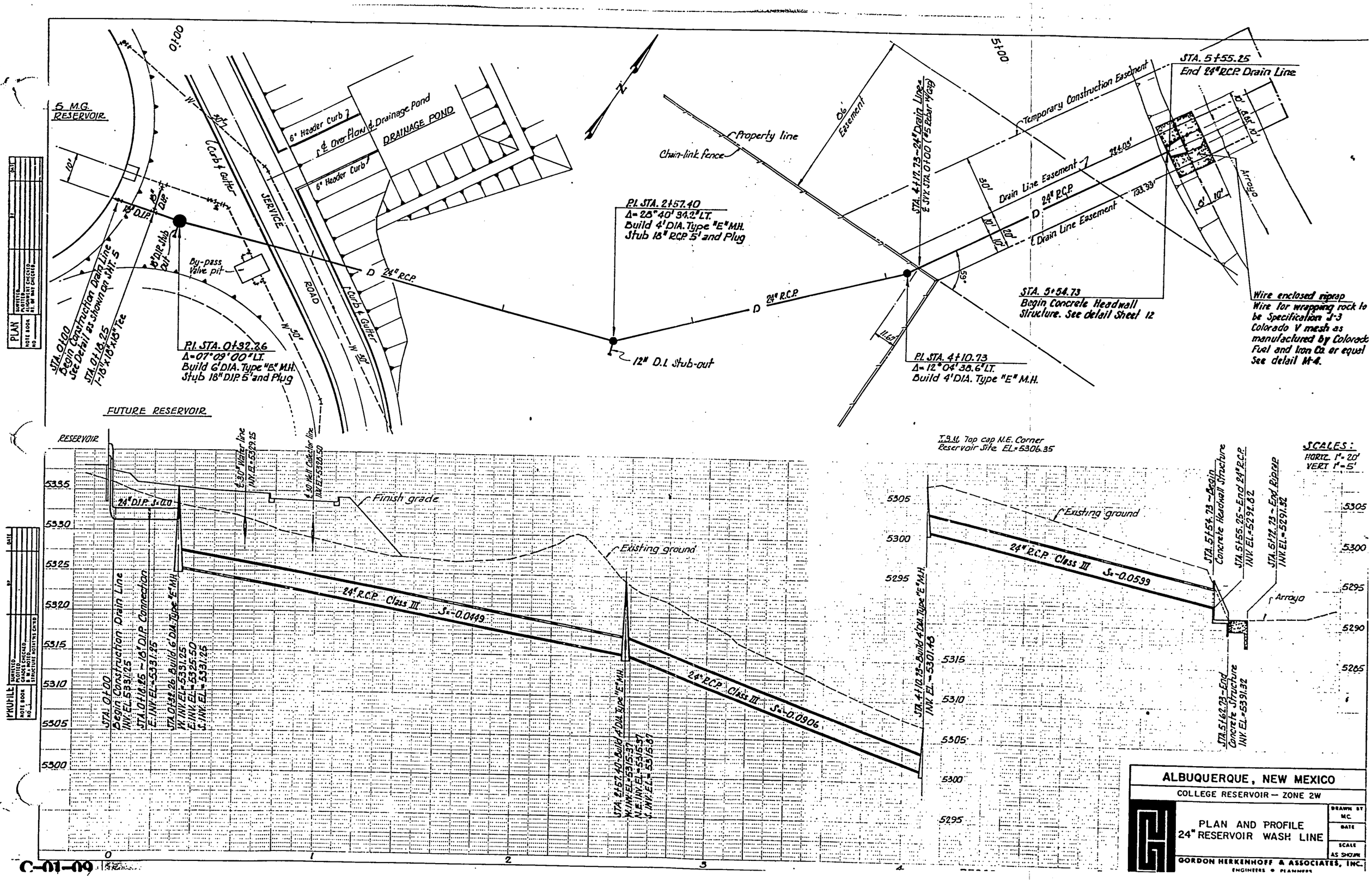
Existing concrete headwall structure at south bank of the Ladera Arroyo (looking east).

Existing concrete headwall structure at south bank of the Ladera Arroyo (looking southeast).

Existing concrete headwall structure at south bank of the Ladera Arroyo (looking southwest).

Existing Ladera Arroyo upstream of headwall (looking west).

Existing Ladera Arroyo downstream of headwall (looking east).



5 M.G. RESERVOIR
FUTURE RESERVOIR
RESERVOIR
6" Header Curb
℄ Overflow & Drainage Pond
DRAINAGE POND
6" Header Curb
Curb & Gutter
SERVICE ROAD
W 30'
18" D.I.P.
18" D.I.P. Stub out
By-pass Valve pit
STA. 0+00 Begin Construction Drain Line See Detail as shown on SHT. 5
STA. 0+18.25 1-18"x18"x18" Tee
P.I. STA. 0+32.26 Δ=07°09'00" LT. Build 6' DIA. Type "E" M.H. Stub 18" D.I.P. 5' and Plug
D 24" R.C.P.
P.I. STA. 2+57.40 Δ=28°40'34.2" LT. Build 4' DIA. Type "E" M.H. Stub 18" R.C.P. 5' and Plug
12" D.I. Stub-out
Property line
Chain-link fence
86' Easement
STA. 4+17.73 - 24" Drain Line = ℄ SVY. STA. 0+00 (#5 Rebar W/Cap)
Temporary Construction Easement
Drain Line Easement
224.03'
133.33'
30'
20'
10'
59°
11.67'
P.I. STA. 4+10.73 Δ=12°04'38.6" LT. Build 4' DIA. Type "E" M.H.
STA. 5+54.73 Begin Concrete Headwall Structure. See detail Sheet 12
STA. 5+55.25 End 24" R.C.P. Drain Line
Arroyo
8' 10'
Wire enclosed riprap
Wire for wrapping rock to be Specification J-3 Colorado V mesh as manufactured by Colorado Fuel and Iron Co. or equal See detail M-4.
T.B.M. Top cap N.E. Corner Reservoir Site EL.=5306.35
SCALES: HORIZ. 1"=20' VERT. 1"=5'
Finish grade
Existing ground
24" D.I.P. S=0.0
24" R.C.P. Class III S=-0.0449
24" R.C.P. Class III S=-0.0906
24" R.C.P. Class III S=-0.0599
STA. 0+00 Begin Construction Drain Line INV. EL.=5331.25
STA. 0+18.25 - 18" D.I.P. Connection E. INV. EL.=5331.25
STA. 0+32.26 - Build 6' DIA. Type "E" M.H. W. INV. EL.=5331.25 E. INV. EL.=5325.50 S. INV. EL.=5331.25
STA. 2+57.40 - Build 4' DIA. Type "E" M.H. W. INV. EL.=5315.37 N.E. INV. EL.=5315.37 S. INV. EL.=5315.87
STA. 4+10.73 - Build 4' DIA. Type "E" M.H. INV. EL.=5301.48
STA. 5+54.73 - Begin Concrete Headwall Structure
STA. 5+55.25 - End 24" R.C.P. INV. EL.=5292.82
STA. 5+72.73 - End Riprap INV. EL.=5291.32
STA. 5+62.73 - End Concrete Structure INV. EL.=5391.32
5335
5330
5325
5320
5315
5310
5305
5300
5295
5290
5285
0
1
2
3
4
PLAN
PROFILE
ALBUQUERQUE, NEW MEXICO
COLLEGE RESERVOIR — ZONE 2W
PLAN AND PROFILE 24" RESERVOIR WASH LINE
DRAWN BY M.C.
DATE
SCALE AS SHOWN
GORDON HERKENHOFF & ASSOCIATES, INC.
ENGINEERS • PLANNERS

C-01-09