PLANS/PLATS ON FILE

FILE DESC: C-22/D015

PLANS/PLATS 4

DRAINAGE INFORMATION SHEET

PROJECT TITLE: Michael Barker Residence ZONE ATLAS/DRNG. FILE #: C-22/D-15

LEGAL DESCRIPTION: Lot 3, Block 8, Tract 2, Unit 1, North Albuquerque Acres

CITY ADDRESS:

ENGINEERING FIRM: Lovelady & Associates CONTACT: Frank Lovelady

ADDRESS: 7408 Morrow Ave. NE 87110 PHONE: 883-7973

OWNER: Norman Barker / Michael Barker CONTACT: Norman Barker

ADDRESS 12202 Eagle Rock Ave. N.E.87122 PHONE: 292-3874

ARCHITECT: CONTACT:

ADDRESS: PHONE:

SURVEYOR: Lovelady & Associates CONTACT: Frank Lovelady

ADDRESS: 7408 Morrow Ave. N.E. 87110 PHONE: 883-7973

CONTRACTOR: CONTACT:

ADDRESS: PHONE:

PRE-DESIGN MEETING:

____ YES

X NO

____ COPY OF CONFERENCE RECAP SHEET PROVIDED

RECEIVED DEC 07 1989 HYDROLOGY SECTION

DRB NO.

EPC NO.

PROJECT NO.

TYPE OF SUBMITTAL:

____ DRAINAGE REPORT

X DRAINAGE PLAN

____ CONCEPTUAL GRADING & DRAIN. PLAN

____ GRADING PLAN

____ EROSION CONTROL PLAN

____ ENGINEER'S CERTIFICATION

CHECK TYPE OF APPROVAL SOUGHT:

____ SKETCH PLAT APPROVAL

____ PRELIMINARY PLAT APPROVAL

____ SITE DEVELOPMENT PLAN APPROVAL

____ FINAL PLAT APPROVAL

X BUILDING PERMIT APPROVAL

____ FOUNDATION PERMIT APPROVAL

____ CERTIFICATE OF OCCUPANCY APPROVAL

____ ROUGH GRADING PERMIT APPROVAL

____ GRADING/PAVING PERMIT APPROVAL

OTHER _____ (SPECIFY)

DATE SUBMITTED: December 12, 1989

BY: Frank D. Lovelady
Frank D. Lovelady, P.E.

Rev. 11/84

Metropolitan
Arroyo
Flood
Control
Authority
2600 PROSPECT N.E. - ALBUQUERQUE, N.M. 87107
TELEPHONE (505) 884-2212

Dec. 12, 19[illegible]

To: Frank Lovelady, P.E.
Lovelady & Associates
7408 Morrow Ave NE
Albuquerque, NM 87110

Sheet 1 of 2

From: Clifford E. Anderson, PE&LS Cliff E. Anderson
Drainage Engineer, AMAFCA

Re: Drainage Plan for Michael Baker Residence, Lot 3, Block 8, Tract 2, Unit 1, North Albuquerque Acres (C-22)

The following are AMAFCA's comments on the above referenced plan:

a. It appears that the eastern leg of the entrance drive will back up water onto the adjacent lot. This is not acceptable without authorization from the adjacent landowner. Will the 2 to 3 foot of fill placed in the driveway area alter the flow or elevation of the 100-year floodplain?

b. Is the drainage ditch at the south and west side of the property of sufficient depth to safely carry the onsite and offsite flows. Is erosion protection required at

the ditch curve? Is the outlet carried to a visible watercourse?

c. A detail should be provided which shows how the culvert pipes will be anchored so they do not get carried downstream under major flows and create downstream problems.

d. Are culverts required at the borrow ditch along Richfield Ave? Bernalillo County standards should be followed. Further information on requirements for road culverts can be obtained from Bob Foglesong at Bernalillo County Public Works.

e. The area within the 100-year flood zone should be included in an easement to AMAFCA or other public authority. A sample easement form is included for your reference.

Copy to:
Bob Foglesong, PE & LS, Bernalillo County Public Works Dept.

FILE COPY

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

KEN SCHULTZ
MAYOR

December 18, 1989

Frank Lovelady
Lovelady & Associates
7408 Morrow, NE
Albuquerque, New Mexico 87110

RE: DRAINAGE PLAN FOR MICHAEL BARKER
RECEIVED DECEMBER 7, 1989 (C-22/D15) FOR BUILDING PERMIT

Dear Mr. Lovelady:

Based on the information provided on your submittal of December 7, 1989, the following comments should be addressed prior to building permit approval.

1. After performing a field investigation of the subject property, I determined the arroyo crossing you are proposing may be inadequate for the 100 year flood plain, which is confined to the existing arroyo. The Mapping & Drafting Section has ortho-topography at 1" = 200' to estimate the offsite drainage basin and flow for the analysis required to assure you are not altering or relocating the flood plain.

2. Please address comments provided by AMAFCA, prior to your resubmittal.

If you should have any questions, please do not hesitate to call me at 768-2650.

Cordially,

Gilbert Aldaz

Gilbert Aldaz, P.E. & L.S.
City/County Floodplain Administrator

xc: Bob Foglesong, Bernalillo County PWD
Cliff Anderson, AMAFCA

GA/bsj
(WP+1517)

DRAINAGE INFORMATION SHEET

PROJECT TITLE: Mich[illegible] Barker Residence ZONE ATLAS/D[illegible] FILE #: C-22/D-15

LEGAL DESCRIPTION: Lot 3, Block 8, Tract 2, Unit 1, North Albuquerque Acres

CITY ADDRESS:

ENGINEERING FIRM: Lovelady & Associates CONTACT: Frank Lovelady

ADDRESS: 7408 Morrow Ave. NE 87110 PHONE: 883-7973

OWNER: Norman Barker / Michael Barker CONTACT: Norman Barker

ADDRESS 12202 Eagle Rock Ave. N.E.87122 PHONE: 292-3874

ARCHITECT: CONTACT:

ADDRESS: PHONE:

SURVEYOR: Lovelady & Associates CONTACT: Frank Lovelady

ADDRESS: 7408 Morrow Ave. N.E. 87110 PHONE: 883-7973

CONTRACTOR: CONTACT:

ADDRESS: PHONE:

PRE-DESIGN MEETING:

	YES	DRB NO.
X	NO	EPC NO.
	COPY OF CONFERENCE RECORD SHEET PROVIDED	PROJECT NO.

RECEIVED JAN 11 1990 HYDROLOGY SECTION

TYPE OF SUBMITTAL:

	DRAINAGE REPORT
X	DRAINAGE PLAN
	CONCEPTUAL GRADING & DRAIN. PLAN
	GRADING PLAN
	EROSION CONTROL PLAN
	ENGINEER'S CERTIFICATION
✓	Resubmittal Per Gilbert Aldaz Letter.

CHECK TYPE OF APPROVAL SOUGHT:

	SKETCH PLAT APPROVAL
	PRELIMINARY PLAT APPROVAL
	SITE DEVELOPMENT PLAN APPROVAL
	FINAL PLAT APPROVAL
X	BUILDING PERMIT APPROVAL
	FOUNDATION PERMIT APPROVAL
	CERTIFICATE OF OCCUPANCY APPROVAL
	ROUGH GRADING PERMIT APPROVAL
	GRADING/PAVING PERMIT APPROVAL
	OTHER (SPECIFY)

DATE SUBMITTED: ~~December 13, 1989~~ JAN 11, 1989

BY: Frank D. Lovelady
Frank D. Lovelady, ~~P.E.~~

Rev. 11/84

FILE COPY

BOARD OF COUNTY COMMISSIONERS
HENRY GABALDON, CHAIRMAN
DISTRICT 1
EUGENE M. GILBERT, VICE CHAIRMAN
DISTRICT 3
AL VALDEZ, MEMBER
DISTRICT 2
PATRICIA "PAT" CASSIDY, MEMBER
DISTRICT 4
JACQUELYN SCHAEFER, MEMBER
DISTRICT 5
ALEX ABEYTA, COUNTY MANAGER

County of Bernalillo

State of New Mexico
ONE CIVIC PLAZA N.W.
ALBUQUERQUE, NEW MEXICO 87102

ALVIN J. CAMPBELL, SHERIFF
PATRICK J. PADILLA, TREASURER
GLADYS M. DAVIS, CLERK
SAM L. PEREA, ASSESSOR
THOMAS J. MESCALL, PROBATE JUDGE

January 31, 1990

Frank Lovelady
Lovelady & Associates
7408 Morrow, NE
Albuquerque, New Mexico 87110

RE: DRAINAGE PLAN FOR MICHAEL BARKER RESIDENCE
(C-22/D15) ENGINEER'S STAMP DATED JANUARY 10, 1990

Dear Mr. Lovelady:

Based on the information provided on your submittal for compliance with the Floodplain Ordinance, the drainage plan received January 11, 1990 is approved for Building Permit.

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

If you should have any questions, please do not hesitate to call me at 768-2650.

Cordially,

Gilbert Aldaz

Gilbert Aldaz, P.E. & L.S.
City/County Floodplain Administrator

xc: Bob Foglesong, Bernalillo County PWD
Cliff Anderson, AMAFCA

GA
(WP+1517)

RECEIVED
MAR 0 8 1990
HYDROLOGY SECTION

To: Gilbert Aldaz

I Michael Barker commit to move the dirt off of the Flood plain on Lot 4 and will certify the drainage at 11800 Richfield N.E by Frank Lovelady as per the approved drainage plan

Michael W Barker

BP 90-21

CC:
Patricia Cassidy

Vince Myer
821-9491

Griff Picker
826-1100

FILE COPY

BOARD OF COUNTY COMMISSIONERS
HENRY GABALDON, CHAIRMAN
DISTRICT 1
EUGENE M. GILBERT, VICE CHAIRMAN
DISTRICT 3
AL VALDEZ, MEMBER
DISTRICT 2
PATRICIA "PAT" CASSIDY, MEMBER
DISTRICT 4
JACQUELYN SCHAEFER, MEMBER
DISTRICT 5
ALEX ABEYTA, COUNTY MANAGER

County of Bernalillo

State of New Mexico

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ALBUQUERQUE, NEW MEXICO 87102

ALVIN J. CAMPBELL, SHERIFF
PATRICK J. PADILLA, TREASURER
GLADYS M. DAVIS, CLERK
SAM L. PEREA, ASSESSOR
THOMAS J. MESCALL, PROBATE JUDGE

March 15, 1990

Raymond Quintana
Building Inspector./Planchecker Sr.
One Civic Plaza, NW Room #5025
Albuquerque, New Mexico 87102

RE: BP90-21, MICHAEL BARKER RESIDENCE, LOT 3, BLOCK 8, TRACT 2, UNIT 1, NORTH ALBUQUERQUE ACRES (C-22/D15)

Dear Mr. Quintana:

On March 14, 1990, AMAFCA brought to my attention that the referenced project was placing fill embankment in a 100 year floodplain, and also overexcavating earth material around the proposed building pad and replacing it with broken concrete material. After performing a field visit with Cliff Anderson, from AMAFCA, we found this to be the case. I then contacted your department the same day to have them issue a red tag to stop the work, since placing fill embankment in a floodplain is in violation of the Floodplain Ordinance.

On March 15th, Michael Barker contacted me to determine what needed to be done to assure compliance with the Floodplain Ordinance. I gave him the following criteria which needed to be performed:

1. A letter of commitment that he will have a Registered Engineer certify that the construction complies with my approved drainage plan dated January 31, 1990. The certification must comply with the requirements per the Development Process Manual checklist.

2. The fill embankment placed in the 100 year floodplain must be removed immediately.

3. Do not overexcavate material in the floodplain and replace with broken concrete.

4. Do not place a septic system in the floodplain.

To date Michael Barker has removed the fill embankment and provided me with a commitment to perform certification. I therefore am requesting that prior to your final inspection approval, you contact me to assure all my other concerns have been addressed.

If you should have any questions, please do not hesitate to call me at 768-2650.

Cordially,

Gilbert Aldaz

Gilbert Aldaz, P.E. & L.S.
City/County Floodplain Administrator

xc: Bob Fogelsong, Bernalillo County PWD
Cliff Anderson, AMAFCA
Patricia Cassidy, County Commissioner
Gene Clement, County Department of Environmental Health
Michael Barker, Home Owner

GA
(WP+1517)

Resource Technology, Inc.

2129 OSUNA ROAD NE, SUITE 2A
ALBUQUERQUE, NEW MEXICO 87113
(505) 345-3115

April 16, 1990

Mr. Gilbert Aldaz
City/County Floodplain Administrator
City of Albuquerque, Hydrology Department
P.O. Box 1293
Albuquerque, New Mexico 87103

RECEIVED
APR 18 1990
HYDROLOGY DIVISION

Ref: Flood Plain Analysis - Barker Properties
Lots 3 - 7, Block 8, Tract 2, Unit 1
North Albuquerque Acres, Bernalillo Co. NM
C.O.A. Map C-22, FEMA Panel 11

Dear Gilbert:

A report of our analysis of the 100-year floodplain for the referenced site is attached. It shows that the existing condition floodplain is much smaller than shown on the FEMA floodplan map.

We also analyzed a proposed modification of the arroyo within the site. It shows that the 100-year flow can be contained in a trapezoidal channel about 55 feet wide and 2.5 feet deep with off-site conditions remaining essentially unchanged.

A house has already been constructed on Lot 3 on the basis of an approved drainage plan. Development for the other four lots has not yet been planned. Details of grading and required crossing structures will be provided prior to construction.

At this time we request that you approve the revised existing condition flood plain limits and the proposed channel improvement in concept only. After your approval, we will prepare a Drainage and Grading Plan for the individual lots as development is planned. This plan will address all local drainage issues such as driveways, run-downs and on site landscaping. Also, we will prepare a Letter of Map ~~Amendment~~ Revision for the site, if you and other responsible agencies find this analysis acceptable. Please call if you have any questions.

Sincerely,

Elvidio V. Diniz, PE
Enclosure
ED/rs
cc Bob Fogelsong Bernalillo County Public Works Dept.
Cliff Anderson AMAFCA
Norman Barker (no HEC-2)

DRAINAGE INFORMATION SHEET

FLOOD PLAIN ANALYSIS.

PROJECT TITLE: BARKER PROPERTIES ZONE ATLAS/DRAINAGE FILE # G22 / ~~D16~~ D15

LEGAL DESCRIPTION: LOTS 3,4,5,6,&7 BLOCK 8 TRACT 2 UNIT 1 NORTH ALBUQUERQUE ACRES

CITY ADDRESS: ——

ENGINEERING FIRM: RESOURCE TECHNOLOGY INC. CONTACT: ELIDIO DINIZ OR TUCKER GREEN

ADDRESS: 2129 OSUNA NE STE 2A 87113 PHONE: 345-3115

OWNER: NORMAN BARKER CONTACT: SAME

ADDRESS: 12202 EAGLE ROCK NE 87122 PHONE: 292 3874

ARCHITECT: —— CONTACT: ——

ADDRESS: —— PHONE: ——

SURVEYOR: —— CONTACT: ——

ADDRESS: —— PHONE: ——

CONTRACTOR: —— CONTACT: ——

ADDRESS: —— PHONE: ——

PRE-DESIGN MEETING:

___ YES

X NO

___ COPY OF CONFERENCE RECAP SHEET PROVIDED

DRB NO. ——

EPC NO. ——

PROJECT NO. ——

RECEIVED APR 23 1990 HYDROLOGY DIVISION

TYPE OF SUBMITTAL:

___ DRAINAGE REPORT

___ DRAINAGE PLAN

___ CONCEPTUAL GRADING & DRAIN PLAN

___ GRADING PLAN

___ EROSION CONTROL PLAN

___ ENGINEER'S CERTIFICATION

X OTHER Flood Plain Analysis / Flood Plain Revision

CHECK TYPE OF APPROVAL SOUGHT:

___ SECTOR PLAN APPROVAL

___ SKETCH PLAT APPROVAL

___ PRELIMINARY PLAT APPROVAL

___ SITE DEVELOPMENT PLAN APPROVAL

___ FINAL PLAT APPROVAL

___ BUILDING PERMIT APPROVAL

___ FOUNDATION PERMIT APPROVAL

___ CERTIFICATE OF OCCUPANCY APPROVAL

___ ROUGH GRADING PERMIT APPROVAL

___ GRADING/PAVING PERMIT APPROVAL

___ OTHER Revised existing (SPECIFY) condition flood plain limits, etc.

DATE SUBMITTED: 4/19/90

BY: Tucker Green

REV. 10/85

FILE COPY

BOARD OF COUNTY COMMISSIONERS
HENRY GABALDON, CHAIRMAN DISTRICT 1
EUGENE M. GILBERT, VICE CHAIRMAN DISTRICT 3
AL VALDEZ, MEMBER DISTRICT 2
PATRICIA "PAT" CASSIDY, MEMBER DISTRICT 4
JACQUELYN SCHAEFER, MEMBER DISTRICT 5
VICKIE FISHER, COUNTY MANAGER

County of Bernalillo

State of New Mexico

ONE CIVIC PLAZA N.W.
ALBUQUERQUE, NEW MEXICO 87102

ALVIN J. CAMPBELL, SHERIFF
PATRICK J. PADILLA, TREASURER
GLADYS M. DAVIS, CLERK
SAM L. PEREA, ASSESSOR
THOMAS J. MESCALL, PROBATE JUDGE

April 30, 1990

Tucker Green
Resource Technology, Inc.
2129 Osuna Road, NE Suite 2A
Albuquerque, New Mexico 87113

RE: DRAINAGE REPORT FOR LOTS 3, 4, 5, 6 AND 7, BLOCK B, TRACT 2, UNIT 1, NORTH ALBUQUERQUE ACRES, RECEIVED APRIL 23, 1990 FOR A LETTER OF MAP REVISION REQUEST FOR A FLOODPLAIN (C-22/D15)

Dear Mr. Green:

Based on the information provided on your submittal of April 23, 1990, the following comments must be addressed prior to approval of the floodplain analysis, at which time we will make a formal submittal to FEMA for a Conditional Letter of Map Revision Request:

1. The topography shown on the drainage plan must reflect an actual field survey for the above mentioned lots and the HEC-2 analysis.

2. The HEC-2 analysis indicates that divided flow exist upstream and your report acknowledges this as "some spill-over seemed possible"; therefore, I do not agree with your conclusion that the 100 year floodplain between the limits of the two arroyos has been removed for lots 3, 4, 5 and 6.

3. The upstream natural channels are subject to meander and shift because of sediment load. It is also not apparent that the existing upstream channel was designed for the 100 year flow, or can be maintained to this existing configuration. Please review Guidelines and Specifications for Study Contractors by FEMA, Publication Number 37, Appendix 5, Alluvial Fan Studies, for requirements to perform this analysis. Also enclosed is a copy of a letter from FEMA which outlines additional criteria for Alluvial Fans.

4. Your drainage plan must identify proposed building pad locations, finished floor requirements, and any proposed grading.

5. If crossing structures are proposed for the individual lots, then the required infrastructure must be identified and a hydraulic analysis performed. If dip sections are proposed, then grading and hydraulic analysis must be identified.

6. Construction plans and financial guarantees will be required for the infrastructure improvements identified by the drainage report.

7. A drainage covenant identifying maintenance requirements and the drainage easement must be provided.

8. Calculations for the proposed riprap thickness, gradation and filter blanket must be submitted, which justifies the improvement can handle a 100 year storm and sustain a 30 year life.

9. Analysis of upstream and downstream transition structures will need to be included. How will the riprap at the downstream channel transition function if the channel is in a degradating mode due to natural conditions or previously approved upstream development? If the channel is in a aggradating mode, how will this condition affect the design section and required freeboard?

Please advise your client that FEMA requires a fee for reviewing the Map Revision, which is about $525.00 as of October 1, 1988, and is subject to change once they begin their review, depending on the complexity of the project. When the conditional letter is secured from FEMA, I will then grant approval to construct the riprap channel.

Cordially,

Gilbert Aldaz

Gilbert Aldaz, P.E. & L.S
City/County Floodplain Administrator

xc: Clifford E. Anderson, AMAFCA
Bob Fogelsong, Bernalillo County
Norman Barker, Owner

GA
(wp+1517)

FOR GILBERT ALDAZ - FLOOD PLAIN ADMINISTRATOR

DRAINAGE INFORMATION SHEET

PROJECT TITLE: AMENDMENT TO GRADING/DRAINAGE PLAN ZONE ATLAS/DRAINAGE FILE # C-22/D15

LEGAL DESCRIPTION: LOT 3, BLOCK 8, TRACT 2, UNIT 1, NORTH ALBUQUERQUE ACRES

CITY ADDRESS: _____

ENGINEERING FIRM: RESOURCE TECHNOLOGY INC CONTACT: TUCKER GREEN

ADDRESS: 2129 OSUNA NE SUITE 2A 87113 PHONE: 345-3115

OWNER: MICHAEL BARKER CONTACT: 298 9760

ADDRESS: _____ PHONE: _____

ARCHITECT: _____ CONTACT: _____

ADDRESS: _____ PHONE: _____

SURVEYOR: _____ CONTACT: _____

ADDRESS: _____ PHONE: _____

CONTRACTOR: _____ CONTACT: _____

ADDRESS: _____ PHONE: _____

PRE-DESIGN MEETING:

✓ YES

___ NO

___ COPY OF CONFERENCE RECAP SHEET PROVIDED

DRB NO. _____

EPC NO. _____

PROJECT NO. _____

TYPE OF SUBMITTAL:

___ DRAINAGE REPORT

___ DRAINAGE PLAN

___ CONCEPTUAL GRADING & DRAIN PLAN

___ GRADING PLAN

___ EROSION CONTROL PLAN

___ ENGINEER'S CERTIFICATION

✓ AMENDMENT FOR GRADING/DRAINAGE PLAN IN REFERENCE

CHECK TYPE OF APPROVAL SOUGHT:

___ SECTOR PLAN APPROVAL

___ SKETCH PLAT APPROVAL

___ PRELIMINARY PLAT APPROVAL

___ SITE DEVELOPMENT PLAN APPROVAL

___ FINAL PLAT APPROVAL

___ BUILDING PERMIT APPROVAL

___ FOUNDATION PERMIT APPROVAL

✓ CERTIFICATE OF OCCUPANCY APPROVAL

___ ROUGH GRADING PERMIT APPROVAL

___ GRADING/PAVING PERMIT APPROVAL

✓ OTHER _____ (SPECIFY)

RECEIVED JUL 10 1990 HYDROLOGY DIVISION

DATE SUBMITTED: _____

BY: TUCKER GREEN

REV. 10/85

BOARD OF COUNTY COMMISSIONERS
EUGENE M. GILBERT, CHAIRMAN
DISTRICT 3
ALBERT "AL" VALDEZ, VICE CHAIRMAN
DISTRICT 2
HENRY GABALDON, MEMBER
DISTRICT 1
PATRICIA "PAT" CASSIDY, MEMBER
DISTRICT 4
JACQUELYN SCHAEFER, MEMBER
DISTRICT 5
VICKIE FISHER, COUNTY MANAGER

County of Bernalillo

State of New Mexico

2400 BROADWAY S.E.
ALBUQUERQUE, NEW MEXICO 87102

ALVIN J. CAMPBELL, SHERIFF
PATRICK J. PADILLA, TREASURER
GLADYS M. DAVIS, CLERK
SAM L. PEREA, ASSESSOR
THOMAS J. MESCALL, PROBATE JUDGE

July 10, 1990

Mr. Norman Barker
12202 Eagle Rock Avenue NE
Albuquerque, NM 87108

SUBJECT: Notice of Violation

Dear Mr. Barker:

It has come to our attention that you have, or have caused to have, affected the grade on the property described as Lot 22, Block 3, North Albuquerque Acres, Tract 2, Unit 1, in violation of Bernalillo County Storm Drainage Ordinance, No. 90-6. Section 11, subsection B, paragraph 3 of the Ordinance states:

> "Grading, cut, fill or importation of material in excess of 500 cubic yards or grading of any area of one (1.0) acre or more, or any grading which will adversely affect other properties, arroyos, watercourses, or easements shall conform to drainage control, flood control and erosion control policies and to standards, criteria and procedures established by the County Engineer with respect to drainage, flood control and erosion control. A grading permit, issued by the County Engineer, shall be required for projects involving more than 500 cubic yards of material or one (1.0) acre or more in area. Applications for development of areas known to have been sanitary landfills shall be accompanied by a report which discusses potential health and soil mechanics problems and their solutions. Such reports shall be prepared by a New Mexico Professional Engineer competent in soil mechanics. The grading permit fee shall be $42.00, or as amended from time to time by the Bernalillo County Commission. The issuance of a grading permit by the County Engineer does not relieve the owner/developer from obtaining any additional grading or fill permits that may be required by other county departments, agencies or governmental bodies."

Therefore, you are hereby directed to submit the proper grading and drainage information conforming to the requirements of the

Ordinance to the Bernalillo County Public Works Department at 2400 Broadway SE, Albuquerque, NM 87102 within ten (10) calendar days from the date of this notice. If you fail to comply, the County shall consider filing a criminal complaint against you in the Metropolitan Court to insure compliance or other legal remedy as the County attorney may deem appropriate.

If you have any questions please contact Robert Foglesong of the Bernalillo County Public Works Department, at 843-6120.

Sincerely,

John Ramsey
Public Works Director

JR:RF:srf

xc: B. A. Romero, Engineering Manager
Gene Clement, County Environmental Health
G. J. Foster, Inspector
Deborah S. Seligman, Assistant County Attorney
Joe Diaz, County Attorney
Patricia "Pat" Cassidy, County Commissioner
Herb Hughes, Acting County Manager

MEMO TO FILE C22/D15

DATE: JULY 18, 1990

RE: DRAINAGE SUBMITTAL RECEIVED JULY 10, 1990
FOR CERTIFICATION LOT 3, BLOCK 8, TRACT
UNIT 1, N.A.1.

ELVIDIO @ RESOURCE TECHNOLOGY TOLD ME ON 7/18/90 TO VOID THE ABOVE SUBMITTAL WHICH PROPOSED A DIFFERENT DRIVEWAY WITH BROKEN CONCRETE ~~U~~ HAS EROSION PROTECTION, WHICH DIFFERS FROM PLAN APPROVED FOR BUILDING PERMIT.

ELVIDIO SAID THEY WOULD RESUBMIT PLAN ~~AS~~ THAT SHOWS DRIVEWAY BUILT PER THE APPROVED PLAN, HE WILL ALSO PERFORM HEC-2 ANALYSIS TO DEMONSTRATE FINISHED FLOOR IS ELEVATED ABOVE THE FLOODPLAIN

Gilbert Alby

Resource Technology, Inc.

2129 OSUNA ROAD NE, SUITE 2A
ALBUQUERQUE, NEW MEXICO 87113
(505) 345-3115

RECEIVED
AUG 15 1990
HYDROLOGY DIVISION

August 15, 1990

Mr. Gilbert Aldaz
City/County Flood Plain Administrator
City of Albuquerque, Hydrology Department
P.O.Box 1293
Albuquerque, NM 87103

Ref: Certification for Michael Barker Residence
Lot 3, Block 8, Tract 2, Unit 1 (11800 Richfield NE)
North Albuquerque Acres, Bernalillo Co. NM
C.O.A. Map C-22, FEMA Panel 11

Dear Gilbert:

The owner of this site decided to construct the driveway to the grades shown on the approved (Lovelady) plan rather than continue to try for approval of a revised driveway alignment. The owner does not plan to pave the driveway at this time. Attached is a Xerox copy of the approved plan showing the new as-built elevations at the driveway, at the toe of slope of the arroyo in front of the house, and in the swale surrounding the rear of the house.

I certify that in my judgment the work as described below and on the as-built plan substantially complies with the intent of the approved grading and drainage plan and in several ways is an improvement. It is my understanding that with this certification all requirements for approval of the drainage are fulfilled.

Two major points of which you were previously aware are (1) that before Resource Technology Inc. (RTI) became involved with this project the house was constructed with the finished floor elevation lower than shown on the approved plan and (2) that the design flow in the arroyo (1030 cfs) is larger than is shown on that plan (54.8 cfs). Based on measurements at the front porch and at the top of the step in the garage the finished floor elevation is approximately 5914.35. The living room has a sunken floor but there is no entrance to it lower than the porch elevation. RTI performed a hydraulic analysis (file BKDRPC.OUT) of the arroyo using the Army Corps of Engineers HEC-2 computer program for analysis of water surface profiles. This fixed-bed

model is commonly used in flood plain analysis studies in Bernalillo County and elsewhere. The analysis showed that for a channel invert of 5909.0 the water surface elevation would be approximately 5912.69, with freeboard (1.71 ft) and superelevation (1.97 ft) calculated per City of Albuquerque criteria the elevation is 5914.37. The as-built grade at driveway centerline is approximately elevation 5908.6, about 0.4 feet lower than the approved and analysed grade. Therefore the finished floor of the house will be above the computed 100-year water surface.

As requested, and in order to comply with the approved plan, the rocks and other fill material previously placed in the floodplain along the south bank of the arroyo have been removed and the bank has been graded to approximately the grades shown on the approved plan. In a sense this is unfortunate, since the rocks and fill would have provided protection against erosion on the outside of the channel bend. At the east property line the top of bank is at existing grade and the bed approximately matches existing grade adjacent to a shrub in the arroyo. Compared to the original plan the protrusion of the driveway on the south has been smoothed by having the toe of the bank somewhat closer to the arroyo centerline both east and west of driveway. I would expect this to improve flow both upstream and downstream of the driveway. The driveway has been graded to follow the slope of the road and the arroyo, rather than being flat across as shown on the plan. This, too, seems an improvement. One portion of the drive near the house is steeper than originally drawn but this should not cause a flow problem and is acceptable to the owner.

A close look at the approved plan showed that it was not appropriate to construct the swale at the south (back) and west of the house to the contours shown on the approved plan. For one thing, the swale cross-sections details provided on the approved plan were in conflict with the proposed contours and it was impossible to satisfy both sets of criteria. For another, I was unable to justify either the size (0.69ac) of the offsite flow area shown on the approved plan or the calculated peak flow rate (1.51 cfs). Computing the same offsite area as more of an acre and using current Bernalillo County criteria with a reasonable assumed estimated mix of land use conditions, I calculated the peak 100-year offsite flow at 4.24 cfs and peak onsite flow for the back yard at 1.38 cfs. With these considerations in mind RTI gave the owner general directions for constructing an appropriate swale.

The as-built swale shown on the attached plan by a series of cross-sections follows RTI's directions to a large degree. The swale begins east of the house and directs flow first toward the

south property line and thence along the west property line to the arroyo. It is unlined. Compared to the approved plan the swale is larger and located more toward the center of the lot except near the west property line, where there has been some fill placed on the adjacent lot. A useful result of these changes is to direct offsite flow from east of the site into the arroyo, whereas previously and naturally it would most likely have flowed into the lot southwest of the project site. Because the cross-sections and slopes vary considerable along the swale the HEC-2 program was used to check the capacity of the swale, using n = 0.025 as recommended in the City of Albuquerque DPM (Design Process Manual) for grass. Currently the yard is bare dirt and if the 100-year storm were to happen now the flow would be shallower and faster.

Between the house and the swale on the west is a well-pipe not shown on the original plan. HEC-2 analysis indicates that flow in the swale is about 0.5 feet lower than the concrete pad surrounding the pipe and 2.4 feet lower than the top of the pipe. The top of the pipe is fitted with a cover and is approximately 3.75 feet above the channel bed.

In conclusion, I repeat that - in my judgment - the work substantially complies with the intent of the approved plan and in several ways is an improvement. However, I remain concerned about potential erosion of the south bank, and request the regulatory bodies having authority not only permit but encourage the owner to line the bank with designed erosion protection, although this is not included or required in the approved plan. I believe that any detriment from lesser hydraulic efficiency would be more than offset by increased protection for the house and its occupants.

Sincerely,

Tucker Green P.E.

cc: Michael Barker
Robert Fogelsong, Bernalillo County Public Works Department
Clifford Anderson, AMAFCA

ATTN: GILBERT ALDAZ: AS BUILT

DRAINAGE INFORMATION SHEET

PROJECT TITLE: BARKER RESIDENCE ~~11800 RICHFIELD NE~~ ZONE ATLAS/DRAINAGE FILE # G22/D15

LEGAL DESCRIPTION: LOT 3, BLOCK 8, TRACT 2, UNIT 1, NORTH ALBUQUERQUE ACRES

CITY ADDRESS: 11800 RICHFIELD NE

ENGINEERING FIRM: RESOURCE TECHNOLOGY INC CONTACT: TUCKER GREEN

ADDRESS: 2129 OSUNA NE SUITE 2A 87113 PHONE: 345-3115

OWNER: MICHAEL BARKER CONTACT: _____

ADDRESS: 12104 EAGLE ROCK NE PHONE: 298-9760

ARCHITECT: _____ CONTACT: _____

ADDRESS: _____ PHONE: _____

SURVEYOR: _____ CONTACT: _____

ADDRESS: _____ PHONE: _____

CONTRACTOR: _____ CONTACT: _____

ADDRESS: _____ PHONE: _____

PRE-DESIGN MEETING:

✓ YES

___ NO

___ COPY OF CONFERENCE RECAP SHEET PROVIDED

DRB NO. _____

EPC NO. _____

PROJECT NO. _____

TYPE OF SUBMITTAL:

___ DRAINAGE REPORT

___ DRAINAGE PLAN

___ CONCEPTUAL GRADING & DRAIN PLAN

___ GRADING PLAN

___ EROSION CONTROL PLAN

___ ENGINEER'S CERTIFICATION

CHECK TYPE OF APPROVAL SOUGHT:

___ SECTOR PLAN APPROVAL

___ SKETCH PLAT APPROVAL

___ PRELIMINARY PLAT APPROVAL

___ SITE DEVELOPMENT PLAN APPROVAL

___ FINAL PLAT APPROVAL

___ BUILDING PERMIT APPROVAL

___ FOUNDATION PERMIT APPROVAL

✓ CERTIFICATE OF OCCUPANCY APPROVAL

___ ROUGH GRADING PERMIT APPROVAL

___ GRADING/PAVING PERMIT APPROVAL

___ OTHER _____ (SPECIFY)

RECEIVED AUG 15 1990 HYDROLOGY DIVISION

DATE SUBMITTED: AUG 15 1990

BY: TUCKER GREEN

REV. 10/85

FILE COPY

BOARD OF COUNTY COMMISSIONERS
HENRY GABALDON, CHAIRMAN DISTRICT 1
EUGENE M. GILBERT, VICE CHAIRMAN DISTRICT 3
AL VALDEZ, MEMBER DISTRICT 2
PATRICIA "PAT" CASSIDY, MEMBER DISTRICT 4
JALQUE_YN SCHAEFER, MEMBER DISTRICT 5
VICKIE FISHER, COUNTY MANAGER

County of Bernalillo

State of New Mexico

ONE CIVIC PLAZA N.W.
ALBUQUERQUE, NEW MEXICO 87102

ALVIN J. CAMPBELL, SHERIFF
PATRICK J. PADILLA, TREASURER
GLADYS M. DAVIS, CLERK
SAM L. PEREA, ASSESSOR
THOMAS J. MESCALL, PROBATE JUDGE

August 24, 1990

Tucker Green
Resource Technology, Inc.
2129 Osuna Road, NE Suite 2A
Albuquerque, New Mexico 87113

RE: DRAINAGE PLAN FOR MICHAEL BARKER RESIDENCE, LOT 3, BLOCK 8, TRACT 2, UNIT 1, (C-22/D15), BUILDING PERMIT 90-21, ENGINEER'S STAMP DATED AUGUST 15, 1990

Dear Mr. Green:

Based on the information received August 15, 1990, the referenced plan is approved for Certificate of Occupancy.

In regards to your concern for the potential erosion along the south bank, I address your concern that you submit a plan for our review and approval that demonstrates the following:

1. An erosion protection barrier that demonstrates it is adequately designed for the 100-year flow, and that the material will not be taken downstream causing problems to other private properties.

2. An erosion protection barrier that will not visually appear as a litter problem.

3. A maintenance covenant agreement that will bind the property owners into assuring the protection barrier is properly maintained.

You being the engineer should address this issue, since the arroyo has been disturbed and is no longer native. If you should have any questions concerning these comments, please do not hesitate to call me at 768-2650.

Cordially,

Gilbert Aldaz

Gilbert Aldaz, P.E. & L.S
City/County Floodplain Administrator

xc: Clifford E. Anderson, AMAFCA
Bob Fogelsong, Bernalillo County

GA
(wp+1517)

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RECEIVED
JAN 11 1990
HYDROLOGY SECTION

½(165×75)	=	6200
½(185+485)×200	=	67,000
½(485+700)×200	=	118,500
½(700+830)×200	=	153,000
½(830+830)×200	=	166,000
½(830+720)×200	=	155,000
½(720+700)×200	=	142,000
½(700+715)×200	=	141,500
½(715+710)×200	=	142,500
½(710+600)×200	=	131,000
½(600+440)×200	=	104,000
½(440+310)×100	=	37,500
½(310+310)×100	=	31,000
½(310+235)×100	=	27,250 27,250
½(235+175)×100	=	20,500
½(175+120)×100	=	14,750
½(120+45)×100	=	8,250
½(45+0)×60		1,350

TOTAL OFF-SITE. 1,467,300 SQ FT = 33.68 AC

PLAN/PLATS

ON

FILE

(1)

RECEIVED
JUL 10 1990
HYDROLOGY DIVISION

AMENDMENT TO GRADING AND DRAINAGE PLAN FOR MICHAEL BARKER RESIDENCE

LOT 3, BLOCK 8, TRACT 2, UNIT 1, NORTH ALBUQUERQUE ACRES
BERNALILLO COUNTY, NEW MEXICO MAP C-22

The site is located in the County on the south side of Richfield Ave. NE, slightly west of Lowell St. NE. A grading and drainage plan for the site was prepared by another engineering firm and approved in early 1990. A feature of that plan was a driveway making an at-grade crossing of the arroyo due north from the house to the street. The house has been constructed but the driveway as originally drawn would be too steep for the owner's convenience. This amendment proposes a different driveway design, also at grade, which will be more suitable.

The driveway will be paved with asphalt and there will be a 20-foot concrete pad extending out from the garage. As shown on the plans, the driveway curves upstream from the house and meets the road near the east property line. As a result the dip will be less deep, the length longer, and the slopes gentler. On the south (house) side the new contours are at approximately the same location as the previously approved contours but slightly rotated in the upstream direction. On the north side the new contours basically match pre-development contours. The existing driveway culvert in the right-of-way for Richfield will be moved to the new location. Two temporary culverts on the site will also be removed and the disturbed area will be reseeded with native vegetation.

The original design was based on a design (peak 100-year) flow rate of 55 cubic feet per second (cfs) and a finished floor elevation of 5915. Subsequent investigation indicates that the design flow should be approximately 1030 cfs and that the finished floor elevation is 5914 at the garage entrance. As part of several investigations regarding this site Resource Technology, Inc. (RTI) conducted hydraulic analyses using the HEC-2 water surface profile computer program. For the driveway redesign RTI combined that previous work with additional cross-sections for the proposed driveway and an "existing" section just downstream of the driveway. The starting water surface elevation was taken from the previous run. A copy of the HEC-2 output is enclosed.

The proposed driveway crosses the arroyo at a significant angle to the main channel and this effect is included in the modelling. East of the driveway the south bank is on the outside of a bend with centerline radius of approximately 200

feet; at the west property line of the subject tract the south side becomes the inside of the next bend downstream. The low point of the proposed drive centerline is at elevation 5909.8, which is the approximate pre-development elevation. The calculated 100-year flow depth is 2.18 feet. The water surface elevation is 5911.98 exclusive of superelevation and 5913.76 with superelevation calculated per Albuquerque DPM criteria.

As shown on the plan, the driveway will be protected by concrete cutoff walls and riprap both upstream and downstream. The cutoff walls extend out to the 5911 contour and the riprap will extend to elevation 5912, the 100 year water surface elevation, on the north. On the south the bank of the arroyo will be lined with riprap up to the superelevation height. This requires constructing a protective berm near the east property line.

AMAFCA uses revised criteria for sizing riprap prepared by Simons, Li & Associates (1984). However, these are valid only for a range of subcritical flow (Froude No. <= 0.8) and the flow in this channel is supercritical. Therefore the required riprap size (D50 = 15 inches) was calculated using the allowable shear stress procedure in the Federal Highway Administration Hydraulic Engineering Circular No. 15 (Drainage of Roadside Channels with Flexible Linings), also prepared by Simons, Li & Associates. The thickness was taken as 1.75 times required the D 50. Since the calculated size falls between two sizes listed in AMAFCA gradation criteria, the next larger size (D50 = 18 inches) was chosen for the gradation. It is expected that most of the riprap will be concrete broken to meet the specified gradation curve. This may be augmented by boulders as shown in a detail on the plan.

FLOOD PLAIN ANALYSIS
FOR
BARKER PROPERTIES
NORTH ALBUQUERQUE ACRES
BERNALILLO COUNTY, NEW MEXICO

RECEIVED
APR 18 1990
HYDROLOGY DIVISION

INTRODUCTION

La Cueva Arroyo Tributary B passes through a largely undeveloped area in North Albuquerque Acres (Map C-22). Attachment 1 is a copy of part of the FEMA Flood Boundary and Floodway Map (Panel 11) which shows a wide shallow floodplain crossing Richfield Ave. N.E. just west of Lowell St. N.E. Mr. Norman Barker, the owner of 5 parcels on the south side of Richfield wishes to develop them for single family residences.

Resource Technology Inc. was selected to verify the existing floodplain and to recommend on-site improvements. Our analysis, based on recent topographic surveying, shows that the existing 100-year floodplain is actually much smaller than is shown on the the FEMA map. In developing the 5 lots, we anticipate changing the on-site channel to a trapezoidal section with riprap bank and bed protection as shown on the attached plan and profile sheet (Attachment 2), together with minor realignment. Drainage easements will be provided to the appropriate agencies.

Included with this report as Attachment 3 is the output from HEC2 Water Surface Profile runs for 100-year existing conditions, 100-year proposed conditions, and proposed conditions at 10 percent of the 100-year flow. Off-site (i.e. sections 1-6 upstream, 10-11 downstream) there is essentially no difference between existing and proposed conditions for the 100-year flow. On-site the flows tend to be slightly deeper and slightly slower under proposed conditions. Velocities for 10 percent of 100-year flows are high enough (>5 fps) to indicate sediment build-up will not be a problem.

LEGAL DESCRIPTION

Lots 3, 4, 5, 6, & 7, Block 8, Tract 2, Unit 1, North Albuquerque Acres
(City of Albuquerque Map C-22, FEMA Floodway Panel 11)

SITE DESCRIPTION

The project site consists of the 3rd through 7th lots west of Lowell St. on the south side, the downhill side, of Richfield Ave. These lots are 1 acre nominal (to road centerline) and about 0.9 acre actual. Richfield is an unpaved road with graded bar ditches on both sides. The soil is coarse-grained, consisting mostly of decomposed granite and sand. The vegetation consists of native grasses, shrubs, and cactus. There are existing dwellings off-site on Lot 2 and on-site on Lot 3. An approved drainage plan for Lot 3 was recently prepared by another New Mexico engineer. The condition for approval was that the FEMA floodplain remain unchanged.

The study reach begins about 800 feet upstream of the site, northeast of the intersection of Lowell and Oakland. The arroyo flows diagonally across the intersection then heads nearly south as a shallow, sandy channel. Field inspection shows that the flow crosses the center and southeast part of the intersection and does not have a split-flow branch to the west as indicated on the topographic map. After it crosses Richfield on grade, it turns and winds mostly westward across the project site. At the west end of the project site the arroyo becomes more deeply channeled and turns southwest with the flood plain cutting across the southwest corner of lot 7. The centerline slope is steep (3%-4%) throughout the study reach. Some flow might be diverted by the bar ditches as the the arroyo crosses Richfield on grade. However, this would re-enter the arroyo at an existing swale near the west end of the site, so the flow through the site has been assumed constant.

PROPOSED CONDITIONS

Under proposed conditions the off-site arroyo remains unchanged and most of the arroyo on-site will be shaped into a trapezoidal section with 3H:1V side slopes. The channel will be re-graded to a uniform centerline slope between Sections 6.1 and 9. The S-bend east of Section 7.3 will be shifted west with a small change in curvature and portions of the existing flood plain between 7.2 and 9 will be filled in. The alignment will be straightened slightly, but not fully, between 7.3 and 10. The channel treatment will end at Section 10 so that existing condition flow patterns will be re-established before the first off-site section.

Riprap is planned on-site for the entire water-filled portion of the channel upstream of 7.2, and for both banks (but not the bed) between 9 and 10, including the mouth of the side inlet.

Riprap will also be provided on the south bank between 7.2 and 9 to protect the outside of the bend and nearby private property. The owner may elect to riprap the north bank between 7.2 and 9 in order to protect that property.

The proposed height of riprap, shown in a schedule on the plan and profile sheet is based on water depth plus one foot of freeboard for straight sections and the insides of bends; and on water depth plus superelevation on the outside of bends. Additional freeboard typically will not be provided in the constructed channel, but by use of existing or new grading on the property to raise the slab elevation. This may occur either inside or side of future drainage easements. Side slopes for freeboard shall be no steeper than 3H:1V and the minimum width at freeboard height shall be three feet.

HYDRAULIC ANALYSIS

The 100-year design flow for this project is 1030 cfs. This flow was given as Case I 100-yr. flow in Table 9.3 of "Review and Refinement of the Northeast Heights Drainage Management Plan" (Espey Huston and Associates, May 1980). Case I had the highest flow of the 5 cases listed.

RTI performed a topographic survey to determine actual cross-sections to use in the HEC2 Water Surface Profile computer program. Sections labeled with a decimal (e.g. 7.2) are revised sections surveyed after initial analysis showed the actual present flood plain extent. Section 7.21 in the HEC2 output was Section 7.2 repeated one-foot downstream to reflect the abrupt change in channel treatment. A side flow channel enters at Section 9. This tributary flow area was assumed ineffective for the HEC-2 runs.

Manning's n (roughness) values were taken as follows (the riprap is Type M with a D50 of 12 inches):

CONDITION	N
Natural channel, sandy bed	0.025
Overbank, grass & brush	0.045
Overbank, grass & brush, with roadway carrying flow	0.035
Overbank, filled/reworked	0.035
Riprap, bank or bed	0.040

Flow was super-critical throughout the study reach for all conditions studied - existing and proposed conditions for the 100-yr. flow and proposed conditions for 10 percent of the 100-yr. flow.

Freeboard was based on criteria from the City of Albuquerque Development Process Manual Section 22.3. Superelevation was based on criteria in "Hydraulic Design of Flood Control Channels" (Corps of Engineers EM 1110-2-1601).

Does topo from field Reflect Map

DISCUSSION

The HEC2 runs were based on newly surveyed topography, which differs somewhat from that shown on the City of Albuquerque crthophoto topographic (Map C-22) used as the base map for this project. To make the profiles and flood plains comparable to the FEMA study the flow depths from the HEC2 runs were added to the profile based on centerline elevations taken from the orthophoto topographic map. The stations at which the water surface profile crossed the contours shown on the base map were noted and the flood plain limit at each station was established by extending a line perpendicular to the flowline until it intersected the appropriate contour.

There are several places in the delineation of the existing flood plain where there is a gap in the flood plain boundary. This happens where a side swale enters or where the extended depth lines did not reasonably intercept a contour and some spill-over seemed possible, according to the map. Apparently this is related to the mapping/plotting process only; the HEC2 runs show that in all cases the 100-yr. flow depth is contained within the surveyed cross-section. where

No

The existing conditions analysis shows that the existing flood plain is smaller than shown on the FEMA Floodplain map. In particular the flood plain is mostly confined to the apparent arroyo and does not cover major portions of the front of Lots 3 through 7. Peak velocities are high under existing conditions, with most being in the 11 to 16 feet per second range. These velocities are erosive but the channel may be in equilibrium under a heavy supply of sediment.

Natural arroyos of this type have a tendency to wander, to change their locations, during heavy flows. This is generally unacceptable in developed areas. The changes proposed in this project will stabilize the banks while continuing to allow bed response in the lower portion of the site. Under existing conditions, between Lots 5 and 6, the outside of a bend in the arroyo is fairly close (20 ft.,±) to adjacent property to the south. The proposed partial straightening of the alignment in

Did You look at Alluvial Fan Relocations

this area decreases the tendency for bank erosion and moves the flood plain approximately 10 feet farther from the property line. At the west end of the site (Lot 7) the existing curvature tends to erode away from the south property line.

With the proposed changes on-site flows are more uniform, slightly higher and slightly slower, and of course narrower. Even though rip-rap is rougher than the natural sandy channel, the proposed condition flow is more efficient and wide shallow flow in the rough overbank area is avoided. Sections 9 and 10 are the downstream on-site sections. Channel treatment ends at Section 10 and flow returns to existing condition characteristics at Sections 11 and 12.

Access to the main buildable portions of Lots 3 and 4 at the upstream end of the site will require crossing the arroyo. These crossings have not yet been designed. They may consist of low flow culverts with overflow for major storms. Because of the full riprap lining this portion of the channel has a high roughness and it may be possible to use smoother materials to design crossings hydraulically equivalent, in their downstream effects, to the channel as modeled. If not, additional downstream protection could be provided on-site until the flow again meets design assumptions. Alternatively, at-grade crossings with a deepened low flow lined channel may be considered.

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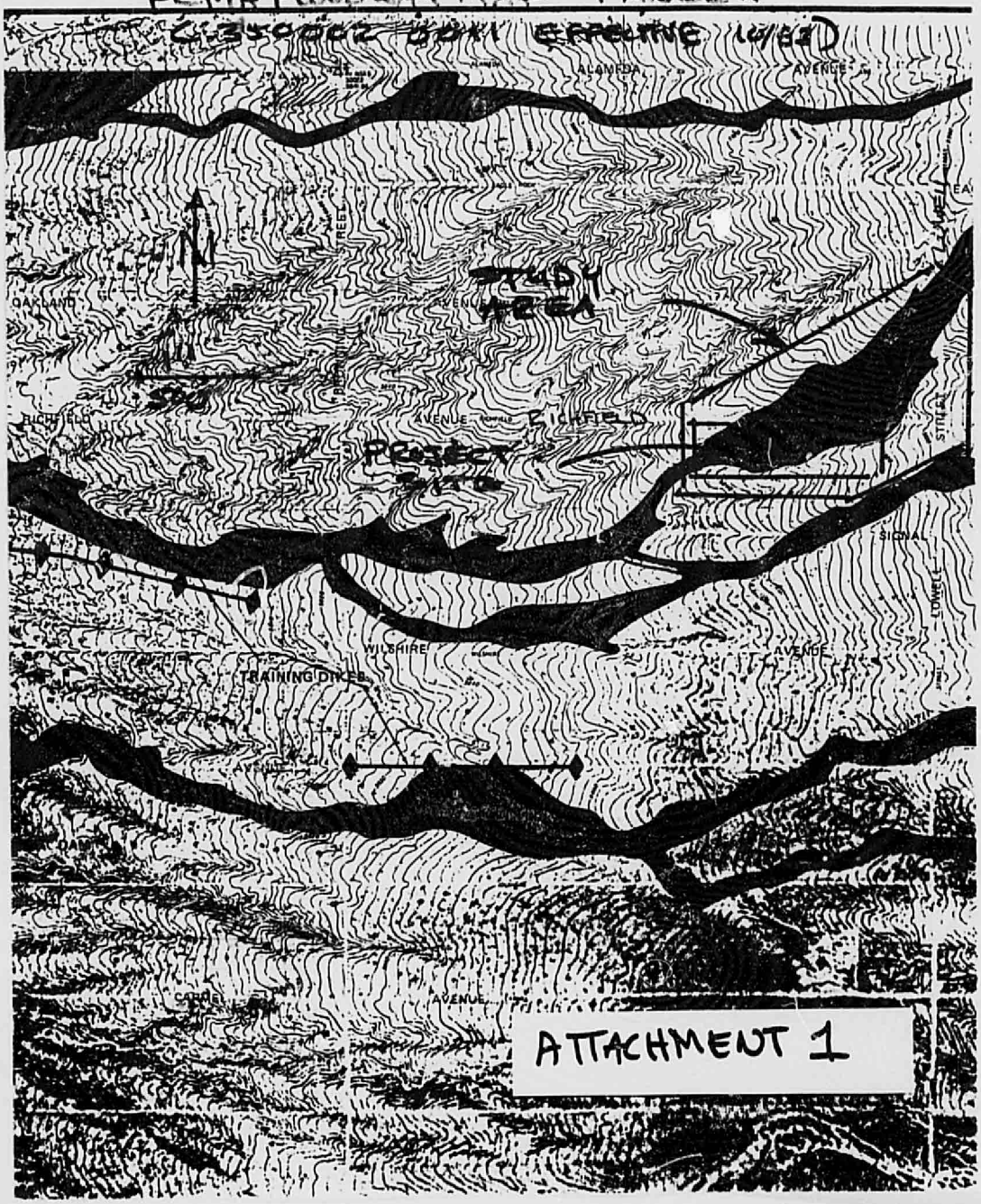
FEMA FLOODWAY MAP PANEL 11



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APR 18 1990
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ATTACHMENT 3

HEC-2 OUTPUT

FOR BARKER TRACT

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APR 18 1990
HYDROLOGY DIVISION

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*****************************************************
*  WATER SURFACE PROFILES                           *
*  VERSION OF NOVEMBER 1976                         *
*  UPDATED MAY 1984                                 *
*  IBM-PC-XT VERSION                                *
*  RUN DATE  04/12/90  TIME  08:37:47               *
*****************************************************
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*************************************
*  U.S. ARMY CORPS OF ENGINEERS     *
*  THE HYDROLOGIC ENGINEERING CENTER *
*  609 SECOND STREET, SUITE D       *
*  DAVIS, CALIFORNIA 95616          *
*  (916) 440-2105 (FTS) 448-2105    *
*************************************
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X     X  XXXXXXX   XXXXX              XXXXX
X     X  X        X     X            X     X
X     X  X        X                  X     X
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X     X  X        X                  X
X     X  X        X     X            X
X     X  XXXXXXX   XXXXX              XXXXXXX
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1
04/12/90 08:37:47

PAGE 1

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 ERROR CODE -  01,02,03,04,05,06
 MODIFICATION -  50,51,52,53,54,55,56
 IBM-PC-XT VERSION
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THIS RUN EXECUTED 04/12/90 08:37:48

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FR
T1      BARKER (LA CUEVA ARROYO TRIB NEAR LOWELL & RITCHFIELD)
T2      SUPERCRITICAL Q100 EXIST. COND.
T3      BKP100EE Q=1030; XSECS REVISED 3/26/90 SURVEY; REVISED OVERBANKS, TOO

J1  ICHECK    INQ      NINV     IDIR     STAT     METRIC   HVINS    Q        WSEL     FQ
      0.       0.       0.       1.    .035000     .00      .0     1030.  5947.000    .000
J2  NPROF     IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE
    -1.000     .000   -1.000     .000    5.000     .000     .000     .000     .000     .000
J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    38.000   39.000   33.000   42.000    8.000    1.000    2.000   25.000    4.000   26.000

    10.000    3.000     .000     .000     .000     .000     .000     .000     .000     .000

NC      .045     .035     .025     .100     .300     .000     .000     .000     .000     .000
X1     1.000   14.000  167.310  180.960  240.000  238.000  243.000     .000     .000     .000
GR  5948.200     .000 5946.350   43.290 5947.610  113.430 5946.130  134.930 5947.160  138.700
GR  5947.000  153.540 5946.610  167.310 5944.910  172.110 5947.760  188.960 5945.810  223.360
GR  5945.900  239.130 5945.740  266.670 5944.260  274.030 5946.430  277.310 5947.310  283.290
GR  5950.000  349.640     .000     .000     .000     .000     .000     .000     .000     .000

NC      .045     .045     .035     .100     .300     .000     .000     .000     .000     .000
X1     1.000   14.000  167.310  [illegible]  [illegible]  [illegible]  [illegible]  [illegible]  [illegible]  [illegible]
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GR	5939.000	.000	5938.410	56.270	5936.890	65.420	5939.280	107.730	5935.860	209.180
GR	5935.900	249.130	5937.020	254.180	5937.080	267.420	5936.810	282.020	5935.750	286.560
GR	5938.900	309.410	.000	.000	.000	.000	.000	.000	.000	.000
NC	.035	.045	.025	.100	.300	.000	.000	.000	.000	.000
X1	3.000	11.000	379.910	410.550	105.000	130.000	105.000	.000	.000	.000
GR	5929.900	.000	5928.820	113.750	5927.670	136.670	5928.710	147.680	5928.630	272.550
GR	5925.500	350.660	5925.270	369.910	5925.810	379.910	5923.160	398.130	5924.910	410.550
GR	5930.500	516.400	.000	.000	.000	.000	.000	.000	.000	.000

NC	.045	.045	.025	.100	.300	.000	.000	.000	.000	.000
X1	4.000	14.000	489.020	550.080	165.000	165.000	170.000	.000	.000	.000
GR	5924.000	.000	5922.010	93.790	5923.450	137.810	5923.490	243.050	5920.410	489.020
GR	5919.700	508.260	5923.030	550.080	5922.020	587.720	5923.790	591.640	5925.130	613.110
GR	5925.500	627.880	5925.210	632.150	5927.780	641.930	5929.600	693.810	.000	.000
NC	.035	.045	.025	.100	.300	.000	.000	.000	.000	.000
X1	5.000	18.000	528.980	611.690	60.000	85.000	75.000	.000	.000	.000
GR	5921.600	.000	5917.520	107.740	5917.760	151.470	5918.830	215.400	5916.790	242.110
GR	5918.600	267.150	5916.670	369.490	5917.210	481.060	5914.760	490.970	5916.350	496.530
GR	5916.500	515.550	5916.250	528.980	5915.170	533.360	5916.400	543.780	5914.160	579.520
GR	5914.100	587.680	5919.140	611.690	5922.010	766.520	.000	.000	.000	.000
NC	.045	.045	.025	.100	.300	.000	.000	.000	.000	.000
X1	6.100	15.000	56.500	89.500	220.000	190.000	215.000	.000	.000	.000
GR	5915.600	.000	5914.110	3.100	5915.250	8.500	5914.490	17.500	5913.110	35.500
GR	5912.800	44.500	5912.920	56.500	5912.500	64.500	5911.940	66.300	5911.970	74.500
GR	5912.800	80.500	5912.830	85.500	5915.190	89.500	5918.880	100.500	5915.950	113.500
X1	7.100	15.000	67.000	150.000	160.000	170.000	170.000	.000	.000	.000
GR	5906.700	.000	5905.790	2.500	5906.800	14.500	5906.990	34.500	5906.950	54.500
GR	5906.100	67.000	5904.920	69.200	5904.900	88.000	5905.680	104.500	5905.960	114.500
GR	5905.500	123.000	5905.980	138.000	5907.500	150.000	5908.090	157.000	5908.700	180.000
X1	7.200	20.000	135.000	162.500	125.000	155.000	150.000	.000	.000	.000
GR	5903.100	.000	5901.200	25.800	5900.800	44.000	5901.230	81.000	5900.250	99.500
GR	5900.700	107.000	5900.720	113.000	5900.310	116.000	5900.550	122.300	5900.230	127.000
GR	5900.500	135.000	5898.670	141.500	5898.850	154.000	5899.000	157.000	5899.180	162.500
GR	5898.600	164.000	5898.730	167.000	5901.270	173.000	5902.060	188.000	5901.840	200.000
X1	7.300	21.000	109.000	149.500	215.000	142.[illegible]	185.000	.000	.000	.000
GR	5897.700	.000	5896.910	20.500	5896.240	26.00	5894.320	32.000	5896.120	42.620
GR	5896.200	49.000	5894.590	56.500	5893.890	64.000	5893.700	68.000	5893.970	80.000
GR	5895.200	87.000	5894.890	109.000	5893.090	115.000	5892.540	131.500	5893.460	137.000
GR	5892.300	141.500	5892.250	146.000	5894.720	149.500	5895.930	162.000	5895.650	171.000
GR	5895.700	175.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	9.000	15.000	223.400	316.720	140.000	150.000	135.000	.000	.000	.000
X3	10.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
GR	5895.400	.000	5895.980	39.120	5894.520	48.900	5895.430	52.180	5895.130	76.150
GR	5893.500	81.440	5895.430	90.380	5890.750	152.050	5887.930	159.630	5887.790	168.270
GR	5889.900	175.460	5889.909	223.400	5886.350	235.080	5886.740	262.430	5891.360	316.720
X1	10.000	6.000	12.060	58.550	115.000	100.000	105.000	.000	.000	.000
GR	5887.400	.000	5886.480	12.060	5881.220	30.680	5880.840	42.070	5883.250	58.550
GR	5884.700	74.170	.000	.000	.000	.000	.000	.000	.000	.000
X1	11.000	6.000	14.170	54.760	130.000	100.000	105.000	.000	.000	.000
GR	5883.500	.000	5882.930	16.120	5878.050	36.790	5877.950	54.760	5880.780	66.950
GR	5881.700	98.780	.000	.000	.000	.000	.000	.000	.000	.000

THIS MICROFICHE IS THE BEST POSSIBLE REPRODUCTION FROM THE POOR QUALITY OF THE ORIGINAL DOCUMENT.

THIS MICROIMAGE IS THE BEST POSSIBLE REPRODUCTION DUE TO THE POOR QUALITY OF THE ORIGINAL DOCUMENT.

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GR   5881.700    98.700      .000      .000      .000      .000      .000      .000      .000      .000
1
 04/12/90    08:37:47                                                                                PAGE    3

X1     12.000     5.000      .000    61.780   100.000   100.000   100.000      .000      .000      .000
GR   5879.700      .000  5875.050    13.890  5874.610    49.550  5877.030    61.780  5879.400    98.190
EJ      .000      .000      .000      .000      .000      .000      .000      .000      .000      .000
1
 04/12/90    08:37:47                                                                                PAGE    4

   SECNO     DEPTH    CWSEL    CRIWS    WSELK     EG       HV       HL     OLOSS   BANK ELEV
   Q         QLOB     QCH      QROB     ALOB      ACH      AROB     VOL     TWA   LEFT/RIGHT
   TIME      VLOB     VCH      VROB     XNL       XNCH     XNR      WTN     ELMIN      SSTA
   SLOPE     XLOBL    XLCH     XLOBR    ITRIAL    IEC      ICONT    CORAR   TOPWID     ENDST

PROF 1    .

CCHV=    .100 CEHV=    .300
#SECNO 1.000

3261 DIVIDED FLOW

     1.00      2.72  5946.98  5947.40  5947.00  5948.32     1.33      .00      .00  5946.61
    1030.       74.     215.     741.      25.      19.      83.       0.       0.  5947.76
      .00      2.96    11.59     8.92     .045     .025     .035     .000  5944.26    28.46
  .035141        0.       0.       0.        0       11        5      .00   174.34   281.07
0
CCHV=    .100 CEHV=    .300
#SECNO 2.000

3261 DIVIDED FLOW

     2.00      1.58  5937.33  5937.74      .00  5938.62     1.29     9.69      .01  5939.28
    1030.        6.     902.     122.       2.       95.     23.       1.       1.  5937.03
      .01      2.59     9.55     5.26     .045     .035     .045     .000  5935.75    62.77
  .046515      240.     243.     238.        5       19        0      .00   142.92   298.03
0
CCHV=    .100 CEHV=    .300
#SECNO 3.000

3301 HV CHANGED MORE THAN HVINS

     3.00      3.01  5926.17  5926.97      .00  5928.86     2.69     9.61      .14  5925.81
    1030.      140.     830.      59.      27.      57.     15.       1.       2.  5924.91
      .01      5.14    14.47     3.92     .035     .025     .045     .000  5923.16   333.81
  .026046      315.     280.     275.        7       20        0      .00   100.70   434.51
0
CCHV=    .100 CEHV=    .300
#SECNO 4.000

3301 HV CHANGED MORE THAN HVINS

     4.00      1.79  5921.49  5922.31      .00  5924.72     3.23     4.09      .05  5920.41
    1030.      254.     776.       0.      46.      48.      0.       2.       2.  5923.03
      .02      5.50    16.32      .00     .045     .025     .045     .000  5919.70   403.39
  .063332      105.     105.     130.        7       15        0      .00   127.29   530.68
0
1
 04/12/90    08:37:47                                                                                PAGE    5

   SECNO     DEPTH    CWSEL    CRIWS    WSELK     EG       HV       HL     OLOSS   BANK ELEV
   Q         QLOB     QCH      QROB     ALOB      ACH      AROB     VOL     TWA   LEFT/RIGHT
   TIME      VLOB     VCH      VROB     XNL       XNCH     XNR      WTN     ELMIN      SSTA
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CDHV=    .100 CEHV=    .300
#SECNO 5.000

3301 HV CHANGED MORE THAN HVINS

     5.00     2.44  5916.54  5917.16      .00  5918.17     1.64     6.07      .48  5916.25
    1030.      78.     952.       0.      16.      90.       0.       2.       2.  5919.14
      .02     4.85    10.58      .00     .035     .025     .045     .000  5914.10   483.80
  .023059     165.     170.     165.        7       14        0      .00   115.48   599.27
0
CDHV=    .100 CEHV=    .300
#SECNO 6.100

3265 DIVIDED FLOW

     6.10     2.48  5914.42  5915.68      .00  5916.54     2.12     1.59      .05  5912.92
    1030.     244.     786.       0.      44.      61.       0.       2.       3.  5915.19
      .02     5.56    13.00      .00     .045     .025     .045     .000  5911.94     2.44
  .026704      60.      75.      85.        6       11        0      .00    72.08    88.21
0
#SECNO 7.100

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

     7.10     1.53  5906.43  5907.50      .00  5909.45     3.02     7.00      .09  5906.10
    1030.      13.    1017.       0.       4.      73.       0.       3.       3.  5907.50
      .03     3.41    14.02      .00     .045     .025     .045     .000  5904.90      .74
  .058081     220.     215.     190.        7        8        0      .00    88.74   141.55
0
#SECNO 7.200

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

     7.20     2.50  5901.10  5901.86      .00  5903.61     2.51     5.68      .15  5900.50
    1030.     107.     799.     125.      35.      57.      17.       3.       3.  5899.18
      .03     3.08    14.12     7.24     .045     .025     .045     .000  5898.60    30.51
  .021817     160.     170.     170.        5       17        0      .00   128.10   172.59
0
1
 04/12/90    08:37:47                                                                  PAGE    6

    SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS    BANK ELEV
    Q        GLOB     DCH      GROB     ALOB     ACH      AROB     VOL      TWA    LEFT/RIGHT
    TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTX      ELMIN      SSTA
    SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST

#SECNO 7.300

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

     7.30     2.17  5894.42  5895.59      .00  5898.72     4.30     4.72      .18  5894.84
    1030.      56.     974.       0.      12.      57.       0.       3.       4.  5894.72
      .03     4.82    17.07      .00     .045     .025     .045     .000  5892.25    31.49
  .050442     125.     150.     155.        7       11        0      .00    63.60   149.07
0
#SECNO 7.400
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      7.50      2.17  5894.4.  5895.57      .00  5898.72     4.50      4.7.      .10  5894.69
      1030.       56.     974.       0.      12.      57.       0.       3.       4.  5894.72
       .03      4.82    17.07      .00     .045     .025     .045     .000  5892.75    31.69
   .050642      125.     150.     155.       7       11        0      .00    63.60   149.07
0
 #SECNO 9.000

 3301 HV CHANGED MORE THAN HVINS

 3495 OVERBANK AREA ASSUMED NON-EFFECTIVE.ELLEA=     5889.90 ELREA=     5891.36

      9.00      2.14  5888.49  5889.33      .00  5891.12     2.63      7.10      .50  5889.90
      1030.       0.    1030.       0.       0.      79.       0.       4.       4.  5891.36
       .04       .00    13.01      .00     .045     .025     .045     .000  5886.75   228.01
   .029817      215.     165.     142.       5       14        0      .00    55.08   283.09
0
 #SECNO 10.000

 3301 HV CHANGED MORE THAN HVINS

     10.00      2.86  5883.70  5884.85      .00  5887.15     3.44      3.89      .08  5886.48
      1030.       0.    1025.       5.       0.      69.       3.       4.       4.  5883.25
       .04       .00    14.93     2.04     .045     .025     .045     .000  5880.84    21.89
   .027849      140.     135.     150.       6       17        0      .00    47.76    69.66
0
 #SECNO 11.000
     11.00      2.59  5880.54  5881.80      .00  5884.20     3.66      2.92      .02  5882.93
      1030.       0.     937.      93.       0.      59.      14.       4.       4.  5877.95
       .04       .00    15.98     6.44     .045     .025     .045     .000  5877.95    26.26
   .027962      115.     105.     100.       7       11        0      .00    39.64    65.90
0
1
  04/12/90    08:37:47                                                                    PAGE    7

    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
    Q         OLOB      GCH       GROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN      SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICUNT     COHAR     TOPWID     ENDST

 #SECNO 12.000
     12.00      1.63  5876.44  5877.52      .00  5880.33     3.89      3.85      .02  5878.70
      1030.       0.    1030.       0.       0.      65.       0.       4.       4.  5877.03
       .04       .00    15.83      .00     .045     .025     .045     .000  5874.81     8.49
   .050456      130.     105.     100.       8        8        0      .00    50.04    58.52
0
1
  04/12/90    08:37:47                                                                    PAGE    8


                                                                    THIS RUN EXECUTED 04/12/90    08:38:21
 ##############################################
   HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
   ERROR CORR -  01.02.03.04.05.06
   MODIFICATION -  50.51.52.53.54.55.56
   IBM-PC-XT VERSION
 ##############################################

 NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

 BKP100EE Q=1030; XSECS R
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THIS MICROIMAGE IS THE BEST POSSIBLE REPRODUCTION DUE TO THE POOR QUALITY OF THE ORIGINAL DOCUMENT.

SECNO	ALCH	KACHSL	ELMIN	DEPTH	CWSEL	CRIWS	AREA	TOPWID	VCH	HV	EG
1.000	.00	.00	5944.26	2.72	5946.98	5947.40	126.60	174.54	11.59	1.33	5948.32
2.000	243.00	-35.02	5935.75	1.58	5937.33	5937.74	119.93	142.92	9.55	1.29	5938.62
3.000	280.00	-44.96	5923.16	3.01	5926.17	5926.97	99.78	100.70	14.47	2.69	5928.86
4.000	105.00	-32.95	5919.70	1.79	5921.49	5922.31	93.69	127.79	16.32	3.23	5924.72
5.000	170.00	-32.94	5914.10	2.44	5916.54	5917.16	106.04	115.48	10.53	1.64	5918.17
6.100	75.00	-28.80	5911.94	2.48	5914.42	5915.08	104.28	72.08	13.00	2.12	5916.54
7.100	215.00	-32.74	5904.90	1.53	5906.43	5907.30	76.33	88.74	14.02	3.02	5909.45
7.200	170.00	-37.06	5898.60	2.50	5901.10	5901.86	108.48	128.10	14.12	2.51	5903.61
7.300	150.00	-42.33	5892.25	2.17	5894.42	5895.59	68.68	63.60	17.07	4.30	5898.72
9.000	185.00	-31.89	5886.35	2.14	5888.49	5889.33	79.17	55.08	13.01	2.63	5891.12
10.000	135.00	-40.82	5880.84	2.86	5883.70	5884.85	71.16	47.76	14.93	3.44	5887.15
11.000	105.00	-27.52	5877.95	2.59	5880.54	5881.80	73.07	39.64	15.98	3.66	5884.20
12.000	105.00	-29.91	5874.81	1.63	5876.44	5877.52	65.05	50.04	15.83	3.89	5880.33

1
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SUMMARY OF ERRORS AND SPECIAL NOTES

1
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THIS RUN EXECUTED 04/12/90 08:38:22

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*****************************************************
 HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
 ERROR CORR -  01,02,03,04,05,06
 MODIFICATION -  50,51,52,53,54,55,56
 IBM-PC-XT VERSION
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*****************************************************
*  WATER SURFACE PROFILES                           *
*  VERSION OF NOVEMBER 1976                         *
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*****************************************
*  U.S. ARMY CORPS OF ENGINEERS         *
*  THE HYDROLOGIC ENGINEERING CENTER    *
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THIS MICROIMAGE IS THE BEST POSSIBLE REPRODUCTION DUE TO THE POOR QUALITY OF THE ORIGINAL DOCUMENT.

GR	5929.000	.000	5938.410	56.170	5936.890	65.420	5937.280	107.730	5935.160	207.180
GR	5923.900	249.130	5937.030	254.180	5937.000	267.430	5936.910	282.020	5935.750	286.560
GR	5938.900	309.410	.000	.000	.000	.000	.000	.000	.000	.000
NC	.035	.045	.025	.000	.000	.000	.000	.000	.000	.000
X1	3.000	11.000	379.910	410.550	105.000	130.000	105.000	.000	.000	.000
GR	5929.900	.000	5928.829	113.750	5927.670	136.670	5928.710	147.680	5928.630	272.350
GR	5925.500	350.660	5925.270	369.410	5925.810	379.910	5923.160	398.130	5924.910	410.550
GR	5930.500	516.400	.000	.000	.000	.000	.000	.000	.000	.000

NC	.045	.035	.025	.000	.000	.000	.000	.000	.000	.000
X1	4.000	14.000	489.020	550.050	165.000	165.000	170.000	.000	.000	.000
GR	5924.000	.000	5922.010	93.790	5923.450	137.610	5923.440	248.050	5920.410	489.020
GR	5919.700	508.260	5923.030	550.050	5922.020	587.720	5923.770	592.640	5925.130	613.110
GR	5925.500	627.880	5925.210	632.150	5927.780	641.930	5929.600	693.810	.000	.000
NC	.035	.045	.025	.000	.000	.000	.000	.000	.000	.000
X1	5.000	18.000	543.780	611.650	60.000	85.000	75.000	.000	.000	.000
GR	5921.600	.000	5917.520	107.740	5917.760	151.470	5918.830	215.400	5916.790	242.110
GR	5918.600	267.150	5916.670	369.490	5917.210	481.060	5914.760	490.970	5916.350	498.530
GR	5916.500	513.550	5916.250	528.980	5915.170	533.380	5916.400	543.780	5914.160	579.520
GR	5914.100	587.680	5919.140	611.690	5922.010	766.520	.000	.000	.000	.000
NC	.045	.045	.040	.000	.000	.000	.000	.000	.000	.000
X1	6.100	15.000	56.500	89.500	226.000	204.000	215.000	.000	.000	.000
GR	5915.600	.000	5914.110	3.100	5915.250	8.500	5914.490	17.500	5913.110	35.500
GR	5912.800	44.500	5912.920	56.500	5912.500	64.500	5911.940	66.300	5911.970	74.500
GR	5912.800	80.500	5912.930	85.500	5915.190	89.500	5918.860	100.500	5915.950	113.500
NC	.040	.040	.040	.000	.000	.000	.000	.000	.000	.000
X1	7.100	4.000	115.000	145.000	172.000	144.000	158.000	.000	-1.060	.000
GR	5909.900	100.000	5904.900	115.000	5904.900	145.000	5909.900	160.000	.000	.000
NC	.040	.040	.040	.000	.000	.000	.000	.000	.000	.000
X1	7.200	4.000	115.000	145.000	1.000	1.000	1.000	.000	-.720	.000
GR	5903.600	100.000	5898.600	115.000	5898.600	145.000	5903.600	160.000	.000	.000
NH	3.000	.033	115.000	.025	145.000	.040	145.000	.000	.000	.000
X1	7.210	4.000	115.000	145.000	132.000	159.000	145.000	.000	-.760	.000
GR	5903.600	100.000	5898.600	115.000	5898.600	145.000	5903.600	160.000	.000	.000
NH	3.000	.035	115.000	.025	145.000	.040	145.000	.000	.000	.000
X1	7.310	4.000	115.000	145.000	175.000	145.000	160.000	.000	.130	.000
GR	5897.200	100.000	5892.250	115.000	5892.250	145.000	5897.250	160.000	.000	.000
NH	4.000	.045	225.000	.040	240.000	.025	270.000	.040	316.720	.000
X1	9.000	16.000	225.000	285.000	140.000	150.000	135.000	.000	.000	.000
X3	10.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
GR	5895.400	.000	5895.980	39.120	5894.520	48.900	5895.430	52.180	5895.130	76.150
GR	5893.500	81.440	5895.430	90.580	5890.750	152.050	5887.930	159.630	5887.790	168.270
GR	5889.900	175.460	5889.900	223.400	5891.350	225.000	5886.350	240.000	5886.350	270.000
GR	5891.300	285.000	.000	.000	.000	.000	.000	.000	.000	.000
NC	.040	.040	.025	.000	.000	.000	.000	.000	.000	.000
X1	10.000	6.000	12.060	58.550	115.000	100.000	105.000	.000	.000	.000
GR	5887.400	.000	5886.480	12.060	5881.220	30.680	5880.840	42.070	5883.250	58.550
GR	5884.700	94.170	.000	.000	.000	.000	.000	.000	.000	.000

NC	.045	.045	.025	.000	.000	.000	.000	.000	.000	.000
X1	11.000	6.000	16.120	54.760	130.000	130.000	105.000	.000	.000	.000
GR	5883.500	.000	5882.930	16.120	5878.050	36.790	5877.950	54.760	5880.790	64.950

THIS MICROIMAGE IS THE BEST POSSIBLE REPRODUCTION DUE TO THE POOR QUALITY OF THE ORIGINAL DOCUMENT.


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NC      .045      .045      .025      .000      .000      .000      .000      .000      .000      .000
X1    11.000     6.000    16.120    54.760   130.000   100.000   105.000      .000      .000      .000
GR  5883.500      .000  5882.930    16.120  5878.050    36.790  5877.950    54.760  5880.780    66.950
GR  5881.700    78.780      .000      .000      .000      .000      .000      .000      .000      .000

NC      .045      .045      .025      .000      .000      .000      .000      .000      .000      .000
X1    12.000     5.000      .000    61.780      .000      .000      .000      .000      .000      .000
GR  5878.700      .000  5875.050    13.690  5874.810    49.550  5877.030    61.780  5879.400    98.190
EJ      .000      .000      .000      .000      .000      .000      .000      .000      .000      .000
1
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   SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       QLOSS    BANK ELEV
   Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA    LEFT/RIGHT
   TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
   SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST

#PROF 1

CCHV=    .100 CEHV=    .300
#SECNO 1.000

3265 DIVIDED FLOW

     1.00     2.72  5946.98  5947.43  5947.40  5948.32     1.33      .00      .00  5946.61
    1030.      74.      215.      741.      25.      19.      83.      0.      0.  5947.76
      .00     2.95     11.58     8.92     .045     .025     .035     .000  5944.26    28.45
  .035084       0.       0.       0.        0        5        8      .00   174.42   281.08
0
#SECNO 2.000

3265 DIVIDED FLOW

     2.00     1.58  5937.33  5937.74      .00  5938.62     1.29     9.68      .01  5939.28
    1030.       6.      903.      121.      2.      94.      23.      1.      1.  5937.03
      .01     2.59     9.55     5.26     .045     .035     .045     .000  5935.75    62.77
  .046572      240.      243.      238.      5       19        0      .00   142.89   298.02
0
#SECNO 3.000

3301 HV CHANGED MORE THAN HVINS

     3.00     3.02  5926.18  5926.97      .00  5928.87     2.69     9.61      .14  5925.61
    1030.      140.      830.      59.      27.      57.      15.      1.      2.  5924.91
      .01     5.14     14.47     3.92     .035     .023     .045     .000  5923.16   333.80
  .026013      315.      280.      275.      7       20        0      .00   160.72   434.52
0
#SECNO 4.000

3301 HV CHANGED MORE THAN HVINS

     4.00     1.79  5921.49  5922.31      .00  5924.73     3.24     4.09      .05  5920.41
    1030.      253.      777.      0.      46.      48.      0.      2.      2.  5923.03
      .02     5.50     16.33      .00     .045     .025     .035     .000  5919.70   403.43
  .063434      105.      105.      130.      7       15        0      .00   127.25   530.68
0
1
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   SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       QLOSS    BANK ELEV
   Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA    LEFT/RIGHT
   TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
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THIS MICROIMAGE IS THE BEST POSSIBLE REPRODUCTION DUE TO THE POOR QUALITY OF THE ORIGINAL DOCUMENT.

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#SECNO 5.000

3301 HV CHANGED MORE THAN HVINS

     5.00     2.45  5916.55  5917.22      .00  5918.30     1.75     5.98      .45  5916.40
    1030.      141.     889.      0.      28.      79.      0.       2.       2.  5919.14
      .02     5.02    11.25      .00     .035     .025     .045     .000  5914.10   403.76
 .022542      165.     170.     165.        7       14        0      .00   115.56   597.32
0
#SECNO 6.100

3265 DIVIDED FLOW

     6.10     2.47  5914.41  5914.93      .00  5916.12     1.72     2.16      .01  5912.92
    1030.      339.     691.      0.      43.      60.      0.       2.       3.  5915.19
      .02     7.92    11.58      .00     .045     .040     .045     .000  5911.94     2.49
 .042738       60.      75.      85.        6       11        0      .00    71.53    88.17
0
#SECNO 7.100
     7.10     2.50  5906.34  5906.87      .00  5908.36     2.02     7.74      .03  5903.84
    1030.      68.     894.     69.       9.      75.      9.       3.       3.  5903.84
      .03     7.24    11.91     7.24     .040     .040     .040     .000  5903.84   107.49
 .030255      226.     215.     204.        5       11        0      .00    45.01   152.51
0
#SECNO 7.200

3301 HV CHANGED MORE THAN HVINS

     7.20     2.28  5900.16  5900.91      .00  5902.68     2.52     5.63      .05  5897.88
    1030.      63.     905.     63.       8.      68.      8.       3.       3.  5897.88
      .03     8.07    13.26     8.07     .040     .040     .040     .000  5897.88   108.18
 .042598      172.     158.     144.        6       11        0      .00    43.65   151.82
0
1490 NH CARD USED
#SECNO 7.210
     7.21     2.49  5900.33  5900.95      .00  5902.57     2.25      .02      .06  5897.84
    1030.      51.     935.     44.       9.      75.      9.       3.       3.  5897.84
      .03     5.44    12.52     4.76     .035     .025     .040     .000  5897.84   107.53
 .013147       1.       1.       1.        4       11        0      .00    44.94   152.47
0
1
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   SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       DLOSS    BANK ELEV
   Q        QLOB     OCH      QROB     ALOB     ACH      AROB     VOL      TWA      LEFT/RIGHT
   TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN       SSTA
   SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID      ENDST

1490 NH CARD USED
#SECNO 7.310

3301 HV CHANGED MORE THAN HVINS

     7.31     1.75  5894.13  5895.49      .00  5899.08     4.95     3.22      .27  5892.38
    1030.      37.     961.     32.       5.      52.      5.       3.       3.  5892.38
      .03     7.99    18.37     6.98     .035     .025     .040     .000  5892.38   109.71
 .045504      132.     145.     159.        6       11        0      .00    40.52   150.23
0
1490 NH CARD USED
#SECNO 9.000

3301 HV CHANGED MORE THAN HVINS

3495 OVERBANK AREA ARCHIVED NON-EFFECTIVE FLOW
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THIS MICROIMAGE IS THE BEST POSSIBLE REPRODUCTION DUE TO THE POOR QUALITY OF THE ORIGINAL DOCUMENT.

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3495 NO ELEV USED
#SECNO 9.000

3301 HV CHANGED MORE THAN 1VING

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=     5891.35 ELREA=     5891.30

     9.00     1.86  5888.21  5889.33      .00  5891.96     3.75     6.76      .36  5891.35
     1030.      0.    1030.      0.       0.      66.       0.       3.       3.  5891.30
      .04      .00    15.54      .00     .045     .026     .040     .000  5886.35   234.42
  .039267     175.     160.     145.        7       14        0      .00    41.22   275.64
0
 #SECNO 10.000
    10.00     2.81  5883.65  5884.85      .00  5887.29     3.64     4.64      .03  5886.48
     1030.      0.    1026.      4.       0.      67.       2.       4.       3.  5883.25
      .04      .00    15.34     2.22     .040     .025     .040     .000  5880.84    22.07
  .030280     140.     135.     150.        6       17        0      .00    46.38    68.44
0
 #SECNO 11.000
    11.00     2.58  5880.53  5881.81      .00  5884.22     3.69     3.07      .01  5882.93
     1030.      0.     937.     93.       0.      58.      14.       4.       4.  5877.95
      .04      .00    16.04     6.46     .045     .025     .045     .000  5877.95    26.29
  .028287     115.     105.     100.        7       11        0      .00    39.57    65.87
0
 #SECNO 12.000
    12.00     1.63  5876.44  5877.52      .00  5880.33     3.69     3.88      .02  5878.70
     1030.      0.    1030.      0.       0.      65.       0.       4.       4.  5877.03
      .04      .00    15.83      .00     .045     .025     .045     .000  5874.81     8.48
  .050408     130.     105.     100.        8        8        0      .00    50.05    59.53
0
1
 04/10/90    07:56:02                                                                PAGE    7


                                                                THIS RUN EXECUTED 04/10/90    07:56:36
 ****************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55,56
  IBM-PC-XT VERSION
 ****************************************************

 NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

 BKP100PK G=1030     TRAP

 SUMMARY PRINTOUT

      SECNO     XLCH     X*CHSL    ELMIN    DEPTH    CWSEL    CRIWS    AREA     TOPWID    VEL      HV       EG
      1.000      .00       .00   5944.26     2.72   5946.98  5947.43   126.69   174.42   11.58     1.33   5948.32
      2.000   243.00    -35.02   5935.75     1.58   5937.33  5937.74   119.87   142.09    9.55     1.29   5938.62
      3.000   280.00    -44.96   5923.16     3.02   5926.18  5926.97    99.84   100.72   14.47     2.69   5928.87
      4.000   105.00    -32.95   5919.70     1.79   5921.49  5922.31    93.61   127.25   16.33     3.24   5924.73
      5.000   170.00    -32.94   5914.10     2.45   5916.55  5917.22   107.11   115.56   11.25     1.75   5918.30
      6.100    75.00    -28.80   5911.94     2.47   5914.41  5914.93   102.46    71.53   11.58     1.72   5916.12
      7.100   215.00    -37.67   5903.84     2.50   5906.34  5906.87    93.86    45.01   11.91     2.02   5908.36
```

THIS MICROIMAGE IS THE BEST POSSIBLE REPRODUCTION DUE TO THE POOR QUALITY OF THE ORIGINAL DOCUMENT.

7.200	158.00	-37.72	5897.08	2.28	5900.16	5900.41	83.78	45.65	13.26	2.52	5902.68
7.210	1.00	-39.55	5897.84	2.47	5900.33	5900.95	93.29	44.94	12.52	2.25	5902.57
7.310	145.00	-37.66	5892.38	1.75	5894.13	5895.49	61.50	40.62	18.37	4.95	5899.08
9.000	160.00	-37.69	5886.35	1.86	5888.21	5889.33	66.27	41.22	15.54	3.75	5891.96
10.000	135.00	-40.82	5880.84	2.81	5883.65	5884.85	68.84	46.38	15.34	3.64	5887.29
11.000	105.00	-27.52	5877.95	2.58	5880.53	5881.81	72.76	39.57	16.04	3.67	5884.22
12.000	105.00	-29.91	5874.81	1.63	5876.44	5877.52	65.07	50.05	15.63	3.69	5880.33

SUMMARY OF ERRORS AND SPECIAL NOTES

THIS RUN EXECUTED 04/10/90 07:56:37

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*****************************************
 HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
 ERROR CORR -  01,02,03,04,05,06
 MODIFICATION -  50,51,52,53,54,55,56
 IBM-PC-XT VERSION
*****************************************
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*****************************************
*  WATER SURFACE PROFILES               *
*  VERSION OF NOVEMBER 1976             *
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*****************************************
*  U.S. ARMY CORPS OF ENGINEERS         *
*  THE HYDROLOGIC ENGINEERING CENTER    *
```

THIS MICROFILMED IS THE BEST POSSIBLE REPRODUCTION DUE TO THE POOR QUALITY OF THE ORIGINAL DOCUMENT.

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*****************************************************
*  WATER SURFACE PROFILES                           *
*  VERSION OF NOVEMBER 1976                         *
*  UPDATED MAY 1984                                 *
*  IBM-PC-XT VERSION                                *
*  RUN DATE  04/10/90  TIME  08:14:56               *
*****************************************************
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*************************************
*  U.S. ARMY CORPS OF ENGINEERS     *
*  THE HYDROLOGIC ENGINEERING CENTER *
*  609 SECOND STREET, SUITE D       *
*  DAVIS, CALIFORNIA 95616          *
*  (916) 440-2105 (FTS) 448-2105    *
*************************************
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X     X  XXXXXXX   XXXXX              XXXXX
X     X  X        X     X            X     X
X     X  X        X                        X
XXXXXXX  XXXX     X           XXXXX    XXXXX
X     X  X        X                  X
X     X  X        X     X            X
X     X  XXXXXXX   XXXXX              XXXXXXX
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1
04/10/90 08:14:57


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*************************************************
 HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
 ERROR CORR -  01,02,03,04,05,06
 MODIFICATION -  50,51,52,53,54,55,56
 IBM-PC-XT VERSION
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THIS RUN EXECUTED 04/10/90 08:14:57

```
FR
T1      BARKER SUPERCRIT 0.1# Q100 PROP. COND. SMOOTH SLOPE 6.1-9 TRAP CHAN XSEC
T2      7.1-9,RIPRAP S. ONLY 7.21-9, BOTH 9(NAT+TRAP) & 10(NAT); 9-10 NAT BOTTOM
T3      BKP1PK Q=103      TRAP CHAN M=3H:1V S=30 RIPRAP D50=12" N=.040

J1  ICHECK    INQ       NINV      IDIR      STOT      METRIC    HVINS     Q         WSEL      FQ
     0.       0.        0.        1.      .035000     .00       .0      103.   5946.000     .000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE
   -1.000     .000     -1.000     1.000     5.000     .000      .000      .000      .000      .000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

   38.000    39.000    33.000    42.000     8.000    1.000     2.000    25.000     4.000    26.000

   10.000     3.000     .000      .000      .000     .000      .000      .000      .000      .000

NC     .045      .035      .025      .100      .300      .000      .000      .000      .000      .000
X1    1.000    16.000   167.310   188.960   240.000   238.000   243.000    .900      .000      .000
GR 5948.200     .000  5946.350    43.290  5947.610   113.430  5946.130   134.930  5947.160   138.700
GR 5947.000   153.540 5946.610   167.310  5944.910   172.110  5947.760   188.960  5945.810   223.360
GR 5945.900   239.130 5945.740   266.670  5944.260   274.030  5946.430   277.310  5947.310   283.290
GR 5950.000   348.640     .000      .000      .000      .000      .000      .000      .000      .000

NC     .045      .045      .035      .000      .000      .000      .000      .000      .000      .000
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THIS MICROFIMCH IS THE BEST POSSIBLE REPRODUCTION DUE TO POOR QUALITY OF THE ORIGINAL DOCUMENT.

GR	5939.000	.000	[illegible]	[illegible]	[illegible]	[illegible]	5939.180	[illegible]	[illegible]	[illegible]
GR	5935.900	249.330	5937.030	254.180	5937.000	267.430	5936.810	282.020	5935.750	286.560
GR	5936.900	309.410	.000	.000	.000	.000	.000	.000	.000	.000
NC	.035	.045	.025	.000	.000	.000	.000	.000	.000	.000
X1	3.000	11.000	379.910	410.550	105.000	130.000	105.000	.000	.000	.000
GR	5929.900	.000	5928.830	113.750	5927.670	136.670	5925.710	147.610	5928.630	272.590
GR	5925.500	350.660	5925.270	369.910	5925.810	379.910	5927.160	396.130	5924.910	410.550
GR	5930.500	516.490	.000	.000	.000	.000	.000	.000	.000	.000

1

04/10/90 08:14:57 PAGE 2

NC	.045	.035	.025	.000	.000	.000	.000	.000	.000	.000
X1	4.000	14.000	489.020	550.080	165.000	165.000	170.000	.000	.000	.000
GR	5924.000	.000	5922.010	93.790	5923.450	137.410	5923.440	248.050	5920.410	489.020
GR	5919.700	504.260	5923.030	550.080	5922.020	587.710	5927.770	592.640	5925.130	613.110
GR	5925.500	627.880	5925.210	632.150	5927.780	641.930	5929.600	693.810	.000	.000
NC	.035	.045	.025	.000	.000	.000	.000	.000	.000	.000
X1	5.000	18.000	543.780	611.670	60.000	85.000	75.000	.000	.000	.000
GR	5921.600	.000	5917.520	107.740	5917.780	151.470	5918.830	215.400	5916.790	242.110
GR	5918.600	267.150	5916.670	369.490	5917.210	481.080	5914.780	490.970	5916.350	496.520
GR	5916.500	513.550	5916.250	528.980	5915.170	533.780	5916.400	543.780	5914.160	579.520
GR	5914.100	587.690	5919.140	611.690	5922.010	766.520	.000	.000	.000	.000
NC	.045	.045	.040	.000	.000	.000	.000	.000	.000	.000
X1	6.100	15.000	56.500	89.500	226.000	204.000	215.000	.000	.000	.000
GR	5915.600	.000	5914.110	3.100	5915.250	8.500	5914.490	17.500	5913.110	35.500
GR	5912.800	44.500	5912.920	56.500	5912.500	64.500	5911.940	66.500	5911.970	74.500
GR	5912.800	80.500	5912.830	85.500	5915.190	89.500	5919.880	100.500	5915.950	113.500
NC	.040	.040	.040	.000	.000	.000	.000	.000	.000	.000
X1	7.100	4.000	115.000	145.000	172.000	144.000	156.000	.000	-1.060	.000
GR	5909.900	100.000	5904.900	115.000	5904.900	145.000	5909.900	160.000	.000	.000
NC	.040	.040	.040	.000	.000	.000	.000	.000	.000	.000
X1	7.200	4.000	115.000	145.000	1.000	1.000	1.000	.000	-.720	.000
GR	5903.600	100.000	5898.600	115.000	5898.600	145.000	5903.600	160.000	.000	.000
NH	3.000	.035	115.000	.025	145.000	.040	145.000	.000	.000	.000
X1	7.210	4.000	115.000	145.000	132.000	159.000	145.000	.000	-.760	.000
GR	5903.600	100.000	5898.600	115.000	5898.600	145.000	5903.600	160.000	.000	.000
NH	3.000	.035	115.000	.025	145.000	.040	145.000	.000	.000	.000
X1	7.300	4.000	115.000	145.000	175.000	145.000	160.000	.000	.130	.000
GR	5897.200	100.000	5892.250	115.000	5892.250	145.000	5897.250	160.000	.000	.000
NH	4.000	.045	225.000	.040	240.000	.025	270.000	.040	16.720	.000
X1	9.000	16.000	225.000	285.000	140.000	150.000	135.000	.000	.000	.000
X3	10.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
GR	5895.400	.000	5895.980	39.120	5894.520	48.900	5895.430	52.180	5895.130	76.150
GR	5893.500	81.440	5895.430	90.380	5890.750	152.050	5887.930	159.630	5887.790	168.270
GR	5889.900	175.460	5889.900	183.400	5891.350	225.000	5886.350	240.000	5886.350	270.000
GR	5891.300	285.000	.000	.000	.000	.000	.000	.000	.000	.000
NC	.040	.040	.025	.000	.000	.000	.000	.000	.000	.000
X1	10.000	6.000	12.060	58.550	115.000	100.000	105.000	.000	.000	.000
GR	5887.400	.000	5886.480	12.060	5881.220	30.680	5880.840	42.070	5883.250	58.550
GR	5884.700	94.170	.000	.000	.000	.000	.000	.000	.000	.000

1

04/10/90 08:14:57 PAGE 3

NC	.045	.045	.025	.000	.000	.000	.000	.000	.000	.000
X1	11.000	6.000	16.170	54.760	130.000	100.000	105.000	.000	.000	.000
GR	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

THIS MICROIMAGE IS THE BEST POSSIBLE REPRODUCTION DUE TO THE POOR QUALITY OF THE ORIGINAL DOCUMENT.


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NC      .045     .045     .025     .000     .000     .000     .000     .000     .000     .000
XI    11.000    6.000   16.120   54.760  130.000  100.000  105.000     .000     .000     .000
GR  5883.500     .000 5882.930   16.120 5878.050   34.790 5877.950   54.760 5880.780   66.950
GR  5881.700   98.780     .000     .000     .000     .000     .000     .000     .000     .000

NC      .045     .045     .025     .000     .000     .000     .000     .000     .000     .000
XI    12.000    5.000     .000   61.780     .000     .000     .000     .000     .000     .000
GR  5878.700     .000 5871.050   13.690 5874.810   49.550 5877.030   61.780 5879.400   98.190
EJ      .000     .000     .000     .000     .000     .000     .000     .000     .000     .000
1
```



```
   SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS    BANK ELEV
   Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA    LEFT/RIGHT
   TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
   SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST

#PROF 1

CCHV=    .100 CEHV=    .300
#SECNO 1.000

3265 DIVIDED FLOW

     1.00     1.67  5945.93  5946.07  5946.00  5946.47      .54      .00      .00  5946.61
     103.      0.     32.      71.      0.       5.      13.      0.       0.   5947.76
      .00      .09    6.95     5.38     .045     .025     .035     .000  5944.26   169.23
  .034910      0.      0.       0.       0        8        7      .00    64.21   276.55
0
#SECNO 2.000

3265 DIVIDED FLOW

     2.00      .56  5936.31  5936.40      .00  5936.65      .34     9.75      .06  5939.28
     103.      0.     98.       5.      0.      20.       2.      0.       0.   5937.03
      .01      .00    4.77     3.03     .045     .035     .045     .000  5935.75   195.93
  .047452    240.    243.     238.       4       19        0      .00    61.57   290.60
0
#SECNO 3.000

3301 HV CHANGED MORE THAN HVINS

     3.00     1.34  5924.50  5924.84      .00  5925.55     1.05    11.03      .07  5925.81
     103.      0.    103.       0.      0.      11.       0.      0.       1.   5924.91
      .02      .00    8.24      .00     .035     .025     .045     .000  5923.16   388.93
  .033267    315.    280.     275.       7       23        0      .00    18.69   407.63
0
#SECNO 4.000
     4.00      .84  5920.54  5920.81      .00  5921.42      .88     4.08      .05  5920.41
     103.      1.    102.       0.      1.      14.       0.      0.       1.   5923.03
      .03     1.10    7.55      .00     .045     .025     .035     .000  5919.70   479.23
  .046032    105.    105.     130.       7       15        0      .00    39.48   518.72
0
#SECNO 5.000
1
```



```
   SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS    BANK ELEV
   Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA    LEFT/RIGHT
   TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
   SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST
```

THIS MICROIMAGE IS THE BEST POSSIBLE REPRODUCTION DUE TO THE POOR QUALITY OF THE ORIGINAL DOCUMENT.

```
3265 DIVIDED FLOW

      5.00      .93  5915.03  5915.25      .00  5915.70      .67      5.65      .06  5916.40
      103.       1.     102.       0.       0.      16.       0.        0.       1.  5919.14
       .03     1.75     6.58      .00     .035     .025     .045      .000  5914.10   469.86
   .025129      165.     170.     165.        5        8        0       .00    28.65   592.13
0
 #SECNO 6.100
      6.10     1.13  5913.07  5913.15      .00  5913.45      .38      2.17      .09  5912.92
      103.       7.      96.       0.       4.      19.       0.        0.       1.  5915.19
       .04     1.97     5.08      .00     .045     .040     .045      .000  5911.94    36.75
   .034085       60.      75.      85.        3       11        0       .00    49.15    85.90
0
 #SECNO 7.100
      7.10      .59  5904.43  5904.53      .00  5904.92      .48      8.52      .01  5903.84
      103.       2.      99.       2.       1.      18.       1.        0.       1.  5903.84
       .05     3.42     5.63     3.42     .040     .040     .040      .000  5903.84   113.23
   .046512      226.     215.     204.        4       14        0       .00    33.53   146.77
0
 #SECNO 7.200
      7.20      .66  5898.54  5898.58      .00  5898.92      .38      5.97      .03  5897.88
      103.       2.      99.       2.       1.      20.       1.        1.       1.  5897.88
       .06     3.03     4.99     3.03     .040     .040     .040      .000  5897.88   113.02
   .031280      172.     148.     144.        3        8        0       .00    33.97   146.96
0
 1490 NH CARD USED
 #SECNO 7.210
      7.21      .70  5898.54  5898.54      .00  5898.89      .35      .02      .01  5897.84
      103.       2.     100.       1.       1.      21.       1.       1.       1.  5897.84
       .06     2.06     4.79     1.82     .035     .025     .040      .000  5897.84   112.91
   .010495       1.       1.       1.        0        8        0       .00    34.18   147.09
0
 1490 NH CARD USED
 #SECNO 7.300

 3301 HV CHANGED MORE THAN HVINS

 04/10/90    08:14:57                                                                    PAGE    6

    SECNO     DEPTH    CHSEL    CRINS    WSELK     EG       HV       HL      OLOSS   BANK ELEV
    Q         GLOB     QCH      QROB     ALOB      ACH      AROB     VOL     TWA     LEFT/RIGHT
    TIME      VLOB     VCH      VROB     XNL       XNCH     XNR      WTN     ELMIN      SSTA
    SLOPE     XLOBL    XLCH     XLOBR    ITRIAL    IDC      ICONT    CORAR   TOPWID     ENDST

      7.30      .29  5892.67  5893.09      .00  5894.72     2.05     4.00      .17  5892.38
      103.       1.     102.       1.       0.       9.       0.       1.       1.  5892.38
       .06     5.02    11.54     4.39     .035     .025     .040      .000  5892.38   114.11
   .192899      132.     145.     159.        6        5        0       .00    31.77   145.88
0
 1490 NH CARD USED
 #SECNO 9.000

 3301 HV CHANGED MORE THAN HVINS

 3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=     5891.35 ELREA=     5891.30

      9.00      .61  5886.96  5887.05      .00  5887.41      .46     6.83      .48  5891.35
      103.       0.     103.       0.       0.      19.       0.       1.       1.  5891.30
       .07      .00     5.43      .00     .045     .025     .040      .000  5886.35   238.21
   .018240      175.     160.     145.        4       17        0       .00    33.60   271.81
0
 #SECNO 10.000

 3301 HV CHANGED MORE THAN HVINS
```

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```
    103.      0.     103.      0.      0.     17.      0.      1.      1.   5891.20
     .07     .00     5.43     .00    .045    .025    .040    .000  5886.35   238.21
   .018240   175.    160.    145.       4      17       0     .00   33.60   271.81
0
 #SECNO 10.000

 3301 HV CHANGED MORE THAN HVINS

    10.00     .86  5881.70  5882.13     .00  5883.20    1.50    4.11     .10  5886.48
    103.      0.     103.      0.      0.     10.      0.      1.      2.   5883.25
     .07     .00     9.83     .00    .040    .025    .040    .000  5880.84    29.00
   .060755   140.    135.    150.       [illegible]      17       0     .00   18.92    47.92
0
 #SECNO 11.000

 3301 HV CHANGED MORE THAN HVINS

    11.00     .80  5879.75  5878.95     .00  5879.45     .69    3.51     .24  5882.93
    103.      0.     99.      4.      0.     15.      1.      1.      2.   5877.95
     .08     .00     6.79     2.57    .045    .025    .045    .000  5877.95    33.80
   .021130   115.    105.    100.       5       8       0     .00   24.44    58.23
0
 #SECNO 12.000
    12.00     .50  5875.31  5875.54     .00  5876.09     .78    3.35     .01  5878.70
    103.      0.     103.      0.      0.     15.      0.      1.      2.   5877.03
     .08     .00     7.07     .00    .045    .025    .045    .000  5874.81    12.70
   .033812   130.    105.    100.       6      11       0     .00   39.62    52.32
0
1
  04/10/90    08:14:57                                                          PAGE    7


                                                          THIS RUN EXECUTED 04/10/90    08:15:24
 ************************************************
   HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
   ERROR CURR -  01,02,03,04,05,06
   MODIFICATION -  50,51,52,53,54,55,56
   IBM-PC-XT VERSION
 ************************************************

 NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

 SKP1PK Q=103      TRAP CH

 SUMMARY PRINTOUT

      SECNO     XLCH     K*CHSL    FLMIN    DEPTH    CWSEL    CRIWS    AREA     TOPWID    VCH      HV       EG
      1.000      .00       .00   5944.26     1.67   5945.93   5946.07   17.81    64.21    6.95     .54   5946.47
      2.000   243.00    -35.02   5935.75      .56   5936.31   5936.40   22.24    61.57    4.77     .34   5936.65
      3.000   280.00    -44.96   5923.16     1.34   5924.50   5924.84   12.51    18.69    8.24    1.05   5925.55
      4.000   105.00    -32.95   5919.70      .84   5920.54   5920.81   14.15    39.48    7.55     .88   5921.42
      5.000   170.00    -32.94   5914.10      .93   5915.03   5915.25   15.87    28.65    6.58     .67   5915.70
      6.100    75.00    -28.80   5911.94     1.13   5913.07   5913.15   22.42    49.15    5.08     .36   5913.45
      7.100   215.00    -37.67   5903.84      .59   5904.43   5904.53   18.71    33.53    5.63     .48   5904.92
      7.200   158.00    -37.72   5897.80      .66   5898.54   5898.58   21.16    33.97    4.99     .38   5898.92
      7.210     1.00    -39.55   5897.84      0.70  5898.59   5898.54   25.38    39.18    4.39     .35   5898.89
```

THIS MICROIMAGE IS THE BEST POSSIBLE REPRODUCTION DUE TO THE POOR QUALITY OF THE ORIGINAL DOCUMENT.

7.300	145.00	-37.66	5892.30	.29	5892.67	5893.09	9.08	31.77	11.54	2.05	5894.72
9.000	160.00	-37.69	5886.35	.61	5886.96	5887.05	18.97	33.60	5.43	.46	5887.41
10.000	135.00	-40.82	5880.84	.86	5881.70	5882.13	10.48	18.92	9.83	1.50	5883.20
11.000	105.00	-27.52	5877.95	.80	5878.75	5878.95	16.05	24.44	6.79	.69	5879.45
12.000	105.00	-29.91	5874.81	.50	5875.31	5875.54	14.57	39.62	7.07	.78	5876.09

1
04/10/90 08:14:57 PAGE 8

SUMMARY OF ERRORS AND SPECIAL NOTES

1
04/10/90 08:15:26 PAGE 1

THIS RUN EXECUTED 04/10/90 08:15:26

```
*************************************************
 HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
 ERROR CORR -  01,02,03,04,05,06
 MODIFICATION -  50,51,52,53,54,55,56
 IBM-PC-XT VERSION
*************************************************
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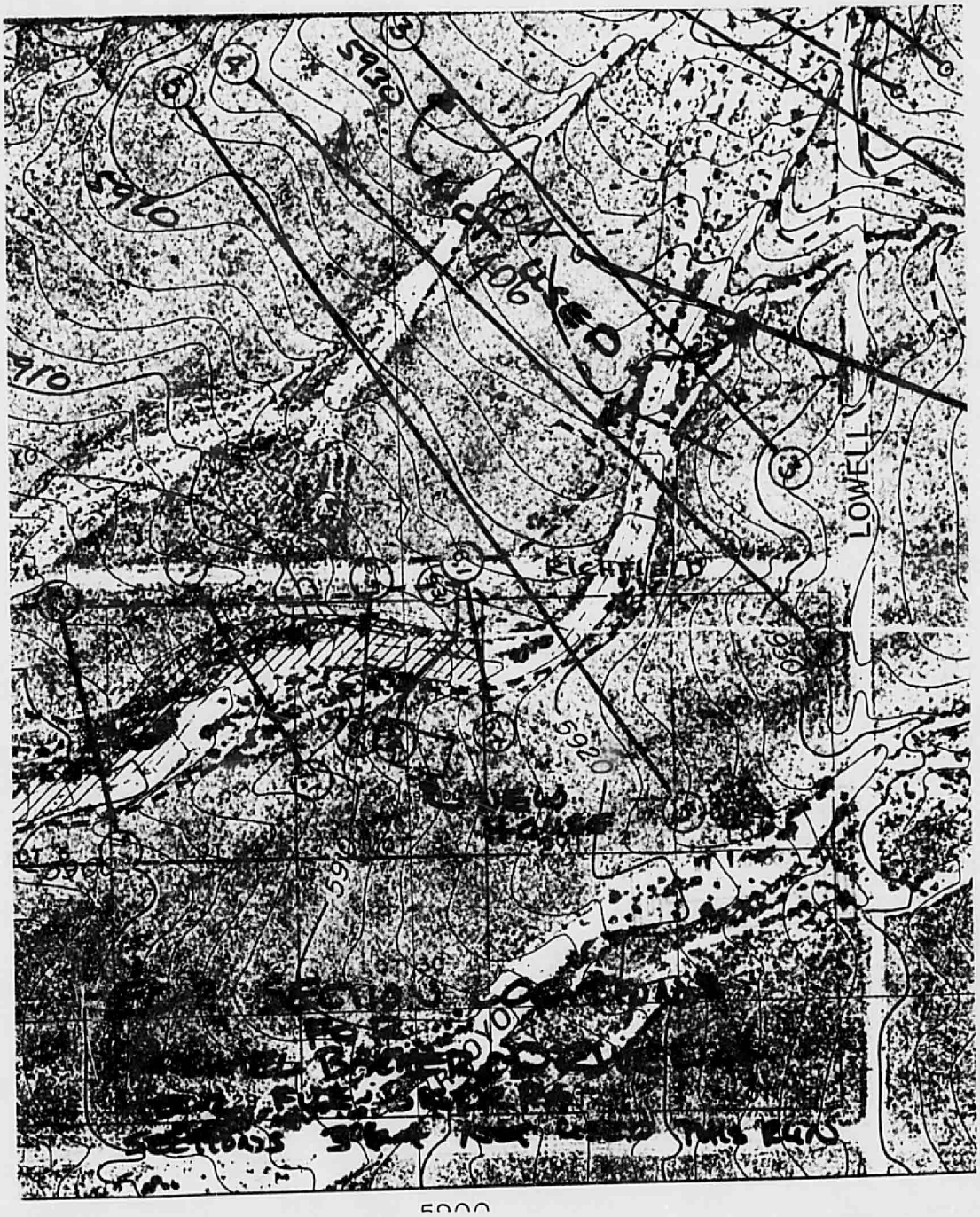
THIS MICROIMAGE IS THE BEST POSSIBLE REPRODUCTION DUE TO THE POOR QUALITY OF THE ORIGINAL DOCUMENT.



THIS MICROIMAGE IS THE BEST POSSIBLE REPRODUCTION DUE TO THE POOR QUALITY OF THE ORIGINAL DOCUMENT.

HEC-5 SECTION LOCATIONS
to
WICHITA BARNES DISTRICT
HEC-5 LIFE BRDSBY
SECTIONS 3 & 4 NOT USED THIS RUN

RECEIVED
JUL 10 1990
HYDROLOGY DIVISION

Homer
& hem

WICHITA

not used

```
1*****************************************************
 *  WATER SURFACE PROFILES                           *
 *  VERSION OF NOVEMBER 1976                         *
 *  UPDATED MAY 1984                                 *
 *  IBM-PC-XT VERSION                                *
 *  RUN DATE  07/05/90  TIME  05:10:07               *
*****************************************************
```

```
*****************************************
 *  U.S. ARMY CORPS OF ENGINEERS         *
 *  THE HYDROLOGIC ENGINEERING CENTER    *
 *  609 SECOND STREET, SUITE D           *
 *  DAVIS, CALIFORNIA 95616              *
 *  (916) 440-2105 (FTS) 448-2105        *
*****************************************
```

RECEIVED
JUL 10 1990
HYDROLOGY DIVISION

```
X     X  XXX XXX   XXXXX              XXXXX
X     X  X         X     X           X     X
X     X  X         X                 X     X
XXXXXXX  XXXX      X           XXXXX  XXXXX
X     X  X         X                 X
X     X  X         X     X           X
X     X  XXXXXXX   XXXXX              XXXXXXX
```

1
07/05/90 05:10:08 PAGE 1

THIS RUN EXECUTED 07/05/90 05:10:08

```
*****************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55,56
  IBM-PC-XT VERSION
*****************************************************
```

```
FR
T1      BARKER (LA CUEVA ARROYO TRIB NEAR LOWELL & RICHFIELD)
T2      SUPERCRITICAL Q100; EXIST COND + DRIVEWAY (6.3) ON SLANT - COSa=0.72
T3      BKDRPA Q=1030; 6.3==> DRIVE, 6.5 "NATURAL" JUST DOWNSTREAM FROM DRIVE

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ
       0.       0.        0.        1.   .000000       .00        .0     1030.  5916.540      .000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE
     -1.000    1.000      .000     1.000     5.000      .000      .000      .000      .000      .000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

     38.000   39.000    33.000    42.000     8.000     1.000     2.000    25.000     4.000    26.000

     10.000    3.000      .000      .000      .000      .000      .000      .000      .000      .000

NC      .035      .045      .025      .100      .300      .000      .000      .000      .000      .000
X1     5.000    18.000   528.980   611.690    60.000    85.000    75.000      .000      .000      .000
GR  5921.600      .000  5917.520   107.740  5917.760   151.470  5918.830   215.400  5916.790   242.110
GR  5918.600   267.150  5916.670   369.490  5917.210   481.060  5914.760   490.970  5916.350   496.530
GR  5916.500   513.550  5916.250   528.980  5915.170   533.360  5916.400   543.780  5914.160   579.520
GR  5914.100   587.680  5919.140   611.690  5922.010   766.520      .000      .000      .000      .000
```

```
NC      .045      .045      .025      .100      .300      .000      .000      .000      .000      .000
X1     6.100    15.000    56.500    89.500    33.000    70.000    52.000      .000      .000      .000
GR  5915.600      .000  5914.110     3.100  5915.250     8.500  5914.490    17.500  5913.110    35.500
GR  5912.800    44.500  5912.920    56.500  5912.500    64.500  5911.940    66.300  5911.970    74.500
GR  5912.800    80.500  5912.830    85.500  5915.190    89.500  5915.880   100.500  5915.950   113.500

X1     6.300    15.000    58.000   112.000    58.000    28.000    46.000      .720      .000      .000
GR  5915.000      .000  5915.000    12.000  5914.800    17.000  5914.000    26.500  5913.000    37.000
GR  5912.000    43.000  5911.000    58.000  5910.000    73.000  5909.800    86.000  5910.000    99.000
GR  5911.000   112.000  5912.000   123.000  5913.000   132.000  5913.350   137.000  5914.000   155.000
1
 07/05/90    05:10:08                                                                          PAGE    2


X1     6.500    11.000    21.000    75.000   120.000   100.000   113.000      .000      .000      .000
GR  5911.700      .000  5911.060    11.000  5908.290    21.000  5908.140    45.000  5908.890    48.000
GR  5908.700    57.000  5909.480    71.000  5910.000    75.000  5911.000    82.000  5913.000    95.000
GR  5913.500   106.000      .000      .000      .000      .000      .000      .000      .000      .000

X1     7.100    15.000    67.000   150.000   160.000   170.000   170.000      .000      .000      .000
GR  5906.700      .000  5905.790     2.500  5906.800    14.500  5906.990    34.500  5906.950    54.500
GR  5906.100    67.000  5904.920    69.200  5904.900    88.000  5905.660   104.500  5905.960   114.500
GR  5905.500   123.000  5905.980   138.000  5907.500   150.000  5908.090   157.000  5908.700   180.000

X1     7.200    20.000   135.000   162.500   125.000   155.000   150.000      .000      .000      .000
GR  5903.100      .000  5901.200    25.800  5900.800    44.000  5901.230    81.000  5900.250    99.500
GR  5900.700   107.000  5900.720   113.000  5900.310   116.000  5900.550   122.300  5900.230   127.000
GR  5900.500   135.000  5898.670   141.500  5898.850   154.000  5899.000   157.000  5899.180   162.500
GR  5898.600   164.000  5898.730   167.000  5901.270   173.000  5902.060   188.000  5901.840   200.000
EJ      .000      .000      .000      .000      .000      .000      .000      .000      .000      .000
1
 07/05/90    05:10:08                                                                          PAGE    3


   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST


*PROF 1

CCHV=    .100 CEHV=    .300
*SECNO 5.000
     5.00      2.44  5916.54  5917.17  5916.54  5918.16      1.62       .00       .00  5916.25
    1030.       79.      951.       0.      16.      90.       0.        0.        0.  5919.14
      .00      4.81     10.53      .00     .035     .025      .045      .000  5914.10   483.77
  .022668        0.        0.       0.        0       10         0       .00    115.53   599.30
0
CCHV=    .100 CEHV=    .300
*SECNO 6.100

3265 DIVIDED FLOW

     6.10      2.48  5914.42  5915.08      .00  5916.54      2.11      1.57       .05  5912.92
    1030.      244.      786.       0.      44.      61.       0.        0.        0.  5915.19
      .00      5.56     12.99      .00     .045     .025      .045      .000  5911.94     2.43
  .020664       60.       75.      85.        6       11         0       .00     72.10    88.21
0
*SECNO 6.300

3301 HV CHANGED MORE THAN HVINS
```

```
      6.30      2.18  5911.98  5912.98       .00  5915.23      3.24      1.20       .11  5911.00
     1030.       12.     1005.       13.       3.      69.       4.        0.        0.  5911.00
       .00      3.43     14.62     3.44      .045     .025      .045      .000  5909.80     34.71
   .028381       33.       52.       70.        6       11         0       .00     53.69     88.40
0
 *SECNO 6.500
      6.50      1.73  5909.87  5910.84       .00  5913.47      3.60      1.72       .04  5908.29
     1030.       28.     1002.        0.       5.      65.       0.        0.        0.  5910.00
       .00      6.24     15.40       .00      .045     .025      .045      .000  5908.14     15.29
   .051272       58.       46.       28.        8       11         0       .00     58.72     74.01
0
 *SECNO 7.100

 3265 DIVIDED FLOW

1
  07/05/90     05:10:08                                                                          PAGE     4

     SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
     Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
     TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
     SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST


 3301 HV CHANGED MORE THAN HVINS

      7.10      1.74  5906.64  5907.29       .00  5908.61      1.97      4.37       .49  5906.10
     1030.       22.     1008.        0.       7.      89.       0.        1.        0.  5907.50
       .01      2.98     11.37       .00      .045     .025      .045      .000  5904.90       .16
   .030133      120.      113.      100.        5       11         0       .00     96.68    143.23
0
 *SECNO 7.200

 3265 DIVIDED FLOW


 3301 HV CHANGED MORE THAN HVINS

      7.20      2.42  5901.02  5901.86       .00  5903.85      2.83      4.67       .09  5900.50
     1030.       91.      812.      127.      29.      55.      17.        1.        1.  5899.18
       .01      3.18     14.86     7.66      .045     .025      .045      .000  5898.60     33.68
   .025304      160.      170.      170.        5       14         0       .00    117.44    172.43
0
1
 CROSS SECTION       5.00
 STREAM  BKDRPA Q=1030; 6.3==> DR
 DISCHARGE=      1030.


 PLOTTED POINTS (BY PRIORITY)-B=BOTTOM BRIDGE,T=TOP BRIDGE,X=GROUND,W=WATER SUR,E=ENERGY GRADIENT,C=CRITICAL WSEL

 ELEV 5914.     5915.     5916.     5917.     5918.     5919.     5920.     5921.     5922.     5923.     5924.


     STA-FEET

  2   0. .        .         .         .         .         .         .         .         X   .         .         .         .
      5. .        .         .         .         .         .         .         .       X     .         .         .         .
     10. .        .         .         .         .         .         .         .     X       .         .         .         .
     15. .        .         .         .         .         .         .         X         .         .         .         .         .
     20. .        .         .         .         .         .         .       X   .         .         .         .         .
     25. .        .         .         .         .         .         .     X     .         .         .         .         .
     30. .        .         .         .         .         .         .   X       .         .         .         .         .
     35. .        .         .         .         .         .         . X         .         .         .         .         .
     40. .        .         .         .         .         .         .
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```
     50. .                                                  X
     55. .                                                 X
     60. .                                                X
     65. .                                               X
     70. .                                             X.
     75. .                                           X
     80. .                                         X
     85. .                                       X
     90. .                                     . X
     95. .                                     X E
    100. .                                   X . E
    105. .                                 X   . E
  3 110. .                               X     . E
    115. .                               X     . E
    120. .                                 X   . E
    125. .                                 X   . E
    130. .                                 X   . E
    135. .                                   X . E
    140. .                                   X . E
    145. .                                   X . E
  4 150. .                                     X . E
    155. .                                     X . E
    160. .                                      X. E
    165. .                                      X E
    170. .                                      .XE
    175. .                                      . X
    180. .                                      .  X
    185. .                                      .  X
    190. .                                      .   X
    195. .                                      .    X
    200. .                                      .     X
    205. .                                      .      X
    210. .                                      .       X
  5 215. .                                      .       X
    220. .                                      .     X
    225. .                                      .XE
    230. .                                   X  . E
    235. .                             X     . E
  6 240. .                         X . C     . E
    245. .                             X     . E
    250. .                               X   . E
    255. .                                  X. E
    260. .                                  . X
  7 265. .                                  .    X
    270. .                                  .     X
    275. .                                  .    X
    280. .                                  .  X
    285. .                                  . X
    290. .                                  .XE
    295. .                                  X E
    300. .                                  X. E
    305. .                                 X . E
    310. .                                 X . E
    315. .                                X  . E
    320. .                              X    . E
    325. .                            X      . E
    330. .                          X        . E
    335. .                        X          . E
    340. .                      X            . E
    345. .                     .XC           . E
    350. .                    X C            . E
    355. .                   X. C            . E
    360. .                  X . C            . E
    365. .                 X  . C            . E
  8 370. .                 X  . C            . E
    375. .                 X  . C            . E
    380. .                 X  . C            . E
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   385. .         .         .       X . C       . E         .         .         .         .         .         .         .
   390. .         .         .        X . C      . E         .         .         .         .         .         .         .
   395. .         .         .        X . C      . E         .         .         .         .         .         .         .
   400. .         .         .        X . C      . E         .         .         .         .         .         .         .
   405. .         .         .        X . C      . E         .         .         .         .         .         .         .
   410. .         .         .         X. C      . E         .         .         .         .         .         .         .
   415. .         .         .         X. C      . E         .         .         .         .         .         .         .
   420. .         .         .         X. C      . E         .         .         .         .         .         .         .
   425. .         .         .         X. C      . E         .         .         .         .         .         .         .
   430. .         .         .          X C      . E         .         .         .         .         .         .         .
   435. .         .         .          X C      . E         .         .         .         .         .         .         .
   440. .         .         .          X C      . E         .         .         .         .         .         .         .
   445. .         .         .          X C      . E         .         .         .         .         .         .         .
   450. .         .         .          .XC      . E         .         .         .         .         .         .         .
   455. .         .         .          .XC      . E         .         .         .         .         .         .         .
   460. .         .         .          .XC      . E         .         .         .         .         .         .         .
   465. .         .         .          .XC      . E         .         .         .         .         .         .         .
   470. .         .         .           . X     . E         .         .         .         .         .         .         .
   475. .         .         .           . X     . E         .         .         .         .         .         .         .
 9 480. .         .         .           . X     . E         .         .         .         .         .         .         .
   485. .         .         .       X    W      . C         . E         .         .         .         .         .         .
10 490. .       X .         .        W     . C      . E         .         .         .         .         .         .         .
11 495. .         .         .       XW     . C      . E         .         .         .         .         .         .         .
   500. .         .         .       XW     . C      . E         .         .         .         .         .         .         .
   505. .         .         .       XW     . C      . E         .         .         .         .         .         .         .
   510. .         .         .        X     . C      . E         .         .         .         .         .         .         .
12 515. .         .         .        X     . C      . E         .         .         .         .         .         .         .
   520. .         .         .       XW     . C      . E         .         .         .         .         .         .         .
   525. .         .         .      X W     . C      . E         .         .         .         .         .         .         .
13 530. .         .         .      X W     . C      . E         .         .         .         .         .         .  BANK.
14 535. .         . X       .        W     . C      . E         .         .         .         .         .         .         .
   540. .         .       X .        W     . C      . E         .         .         .         .         .         .         .
15 545. .         .         .       XW     . C      . E         .         .         .         .         .         .         .
   550. .         .         .X       W     . C      . E         .         .         .         .         .         .         .
   555. .         .       X .        W     . C      . E         .         .         .         .         .         .         .
   560. .         .     X   .        W     . C      . E         .         .         .         .         .         .         .
   565. .         .X        .        W     . C      . E         .         .         .         .         .         .         .
   570. .       X .         .        W     . C      . E         .         .         .         .         .         .         .
   575. .     X   .         .        W     . C      . E         .         .         .         .         .         .         .
16 580. . X       .         .        W     . C      . E         .         .         .         .         .         .         .
   585. .X        .         .        W     . C      . E         .         .         .         .         .         .         .
17 590. .X        .         .        W     . C      . E         .         .         .         .         .         .         .
   595. .         .X        .        W     . C      . E         .         .         .         .         .         .         .
   600. .         .         . X      W     . C      . E         .         .         .         .         .         .         .
   605. .         .         .         .     . X      . E         .         .         .         .         .         .         .
18 610. .         .         .         .     .        .         .X        .         .         .         .         .  BANK.
   615. .         .         .         .     .        .         . X       .         .         .         .         .         .
   620. .         .         .         .     .        .         .  X      .         .         .         .         .         .
   625. .         .         .         .     .        .         .   X     .         .         .         .         .         .
   630. .         .         .         .     .        .         .    X    .         .         .         .         .         .
   635. .         .         .         .     .        .         .     X   .         .         .         .         .         .
   640. .         .         .         .     .        .         .      X  .         .         .         .         .         .
   645. .         .         .         .     .        .         .       X .         .         .         .         .         .
   650. .         .         .         .     .        .         .        X.         .         .         .         .         .
   655. .         .         .         .     .        .         .         X         .         .         .         .         .
   660. .         .         .         .     .        .         .         .X        .         .         .         .         .
   665. .         .         .         .     .        .         .         . X       .         .         .         .         .
   670. .         .         .         .     .        .         .         .  X      .         .         .         .         .
   675. .         .         .         .     .        .         .         .  X      .         .         .         .         .
   680. .         .         .         .     .        .         .         .   X     .         .         .         .         .
   685. .         .         .         .     .        .         .         .    X    .         .         .         .         .
   690. .         .         .         .     .        .         .         .     X   .         .         .         .         .
   695. .         .         .         .     .        .         .         .      X  .         .         .         .         .
   700. .         .         .         .     .        .         .         .       X .         .         .         .         .
   705. .         .         .         .     .        .         .         .        X.         .         .         .         .
   710. .         .         .         .     .        .         .         .         X         .         .         .         .
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    715. .         .         .         
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PLOTTED POINTS (BY PRIORITY)-B=BOTTOM BRIDGE,T=TOP BRIDGE,X=GROUND,W=WATER SUR,E=ENERGY GRADIENT,C=CRITICAL WSEL

ELEV 5909.     5910.     5911.     5912.     5913.     5914.     5915.     5916.     5917.     5918.     5919.

    STA-FEET

 2   0. .        .         .                             .        X E       .         .         .         .         .
     5. .        .         .                             .        X E       .         .         .         .         .
 4  10. .        .         .                             .       XXX E      .         .         .         .         .
    15. .        .         .                             . X        . E      .         .         .         .         .
 5  20. .        .         .                             X          . E      .         .         .         .         .
 6  25. .        .         .                   X         .          . E      .         .         .         .         .
    30. .        .         .             X     C         .          . E      .         .         .         .         .
 7  35. .        .         .         X         C         .          . E      .         .         .         .         .
 8  40. .        .         X         W         C         .          . E      .         .         .         .         .
    45. .        .    X    .         W         C         .          . E      .         .         .         .      BANK.
    50. .       .X         .         W         C         .          . E      .         .         .         .         .
 9  55. .       X          .         W         C         .          . E      .         .         .         .         .
10  60. .      X .         .         W         C         .          . E      .         .         .         .         .
    65. .     X.           .         W         C         .          . E      .         .         .         .         .
11  70. .     X            .         W         C         .          . E      .         .         .         .         .
    75. .        .    X    .         W         C         .          . E      .         .         .         .         .
12  80. .        .         X         W         C         .          . E      .         .         .         .      BANK.
    85. .        .         .     X   W         C         .          . E      .         .         .         .         .
13  90. .        .         .         X         C         .          . E      .         .         .         .         .
14  95. .        .         .                   X         .          . E      .         .         .         .         .
15 100. .        .         .                             X          . E      .         .         .         .         .
   105. .        .         .                               X        . E      .         .         .         .         .
16 110. .        .         .                             X          . E      .         .         .         .         .

NRD=        0 ELLC=  9999999.00 ELTRD=  9999999.00

  EL(I),STA(I)
    5915.00          .00     5915.00        8.64     5914.80       12.24     5914.00       19.08     5913.00       26.64
    5912.00        34.56     5911.00       41.76     5910.00       52.56     5909.80       61.92     5910.00       71.28
    5911.00        80.64     5912.00       88.56     5913.00       95.04     5913.35       98.64     5914.00      111.60
1
CROSS SECTION      6.50
STREAM  BKDRPA Q=1030; 6.3==> DR
DISCHARGE=     1030.


PLOTTED POINTS (BY PRIORITY)-B=BOTTOM BRIDGE,T=TOP BRIDGE,X=GROUND,W=WATER SUR,E=ENERGY GRADIENT,C=CRITICAL WSEL

ELEV 5908.     5909.     5910.     5911.     5912.     5913.     5914.     5915.     5916.     5917.     5918.

    STA-FEET

 2   0. .        .         .         .       X .         .       E .         .         .         .         .         .
     5. .        .         .         .     X   .         .       E .         .         .         .         .         .
 3  10. .        .         .        .X       .         .       E .         .         .         .         .         .
    15. .        .       X W.      C .       .         .       E .         .         .         .         .         .
 4  20. .  X     .         W.      C .       .         .       E .         .         .         .         .      BANK.
    25. .  X     .         W.      C .       .         .       E .         .         .         .         .         .
    30. . X      .         W.      C .       .         .       E .         .         .         .         .         .
    35. . X      .         W.      C .       .         .       E .         .         .         .         .         .
    40. . X      .         W.      C .       .         .       E .         .         .         .         .         .
 5  45. .X       .         W.      C .       .         .       E .         .         .         .         .         .
 6  50. .      X.          W.      C .       .         .       E .         .         .         .         .         .
 7  55. .    X  .          W.      C .       .         .       E .         .         .         .         .         .
    60. .      X           W.      C .       .         .       E .         .         .         .         .         .
```

```
    65. .        . X    W.       C .        .        .   E .        .        .        .        .        .
 8  70. .        .   X  W.       C .        .        .   E .        .        .        .        .        .   BANK.
 9  75. .        .      X        C .        .        .   E .        .        .        .        .        .
10  80. .        .        .        X        .        .   E .        .        .        .        .        .
    85. .        .        .        .        . X      .   E .        .        .        .        .        .
    90. .        .        .        .        .      X .   E .        .        .        .        .        .
11  95. .        .        .        .        .        . X E .        .        .        .        .        .
   100. .        .        .        .        .        .   X E        .        .        .        .        .
12 105. .        .        .        .        .        .   X .        .        .        .        .        .

NRD=       0 ELLC=  9999999.00 ELTRD=  9999999.00

  EL(I),STA(I)
    5911.70        .00     5911.06       11.00     5908.29       21.00     5908.14       45.00     5908.89       48.00
    5908.70      57.00     5909.48       71.00     5910.00       75.00     5911.00       82.00     5913.00       95.00
    5913.50     106.00
1
 CROSS SECTION      7.10
 STREAM  BKDRPA Q=1030; 6.3==> DR
 DISCHARGE=     1030.

 PLOTTED POINTS (BY PRIORITY)-B=BOTTOM BRIDGE,T=TOP BRIDGE,X=GROUND,W=WATER SUR,E=ENERGY GRADIENT,C=CRITICAL WSEL

 ELEV 5904.     5905.     5906.     5907.     5908.     5909.     5910.     5911.     5912.     5913.     5914.


    STA-FEET

 3   0. .        .      XXXXXXXXXX  . C      .     E .        .        .        .        .        .
     5. .        .        . X   W   . C      .     E .        .        .        .        .        .
    10. .        .        .   X     . C      .     E .        .        .        .        .        .
 4  15. .        .        .       X . C      .     E .        .        .        .        .        .
    20. .        .        .       X . C      .     E .        .        .        .        .        .
    25. .        .        .         X. C      .     E .        .        .        .        .        .
    30. .        .        .         X. C      .     E .        .        .        .        .        .
 5  35. .        .        .           X C      .     E .        .        .        .        .        .
    40. .        .        .           X C      .     E .        .        .        .        .        .
    45. .        .        .           X C      .     E .        .        .        .        .        .
    50. .        .        .           X C      .     E .        .        .        .        .        .
 6  55. .        .        .           X C      .     E .        .        .        .        .        .
    60. .        .        .     X     . C      .     E .        .        .        .        .        .
 7  65. .        .        .X    W     . C      .     E .        .        .        .        .        .   BANK.
 8  70. .      X.         .     W     . C      .     E .        .        .        .        .        .
    75. .      X.         .     W     . C      .     E .        .        .        .        .        .
    80. .      X.         .     W     . C      .     E .        .        .        .        .        .
    85. .      X.         .     W     . C      .     E .        .        .        .        .        .
 9  90. .      X.         .     W     . C      .     E .        .        .        .        .        .
    95. .       .X        .     W     . C      .     E .        .        .        .        .        .
   100. .        .   X    .     W     . C      .     E .        .        .        .        .        .
10 105. .        .     X  .     W     . C      .     E .        .        .        .        .        .
   110. .        .      X .     W     . C      .     E .        .        .        .        .        .
11 115. .        .        X     W     . C      .     E .        .        .        .        .        .
   120. .        .     X  .     W     . C      .     E .        .        .        .        .        .
12 125. .        .   X    .     W     . C      .     E .        .        .        .        .        .
   130. .        .     X  .     W     . C      .     E .        .        .        .        .        .
   135. .        .      X .     W     . C      .     E .        .        .        .        .        .
13 140. .        .        X     W     . C      .     E .        .        .        .        .        .
   145. .        .        .     X     . C      .     E .        .        .        .        .        .   BANK.
14 150. .        .        .           .   X    .     E .        .        .        .        .        .
15 155. .        .        .           .      .X     E .        .        .        .        .        .
   160. .        .        .           .      . X    E .        .        .        .        .        .
   165. .        .        .           .      .   X E .        .        .        .        .        .
   170. .        .        .           .      .    XE .        .        .        .        .        .
   175. .        .        .           .      .     X .        .        .        .        .        .
16 180. .        .        .           .      .      X .        .        .        .        .        .
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NRD=       0 ELLC=  9999999.00 ELTRD=  9999999.00

  EL(I),STA(I)
    5906.70          .00      5905.79         2.50      5906.80        14.50      5906.99        34.50      5906.95        54.50
    5906.10        67.00      5904.92        69.20      5904.90        88.00      5905.68       104.50      5905.96       114.50
    5905.50       123.00      5905.98       138.00      5907.50       150.00      5908.09       157.00      5908.70       180.00
1
CROSS SECTION       7.20
STREAM  BKDRPA Q=1030; 6.3==> DR
DISCHARGE=     1030.


PLOTTED POINTS (BY PRIORITY)-B=BOTTOM BRIDGE,T=TOP BRIDGE,X=GROUND,W=WATER SUR,E=ENERGY GRADIENT,C=CRITICAL WSEL

ELEV 5898.     5899.     5900.     5901.     5902.     5903.     5904.     5905.     5906.     5907.     5908.


    STA-FEET

 2   0. .         .         .                   .        .X      E.         .         .         .         .
     5. .         .         .                   .      X  .      E.         .         .         .         .
    10. .         .         .                   .    X    .      E.         .         .         .         .
    15. .         .         .                  X         .      E.         .         .         .         .
    20. .         .         .               X  C.        .      E.         .         .         .         .
 3  25. .         .         .             X    C.        .      E.         .         .         .         .
    30. .         .         .            X     C.        .      E.         .         .         .         .
    35. .         .         .           X      C.        .      E.         .         .         .         .
    40. .         .         .          XW      C.        .      E.         .         .         .         .
 4  45. .         .         .         X W      C.        .      E.         .         .         .         .
    50. .         .         .          XW      C.        .      E.         .         .         .         .
    55. .         .         .          XW      C.        .      E.         .         .         .         .
    60. .         .         .           X      C.        .      E.         .         .         .         .
    65. .         .         .           X      C.        .      E.         .         .         .         .
    70. .         .         .            X     C.        .      E.         .         .         .         .
    75. .         .         .            X     C.        .      E.         .         .         .         .
 5  80. .         .         .             X    C.        .      E.         .         .         .         .
    85. .         .         .           X      C.        .      E.         .         .         .         .
    90. .         .         .       X   W      C.        .      E.         .         .         .         .
    95. .         .         .     X     W      C.        .      E.         .         .         .         .
 6 100. .         .         .   X       W      C.        .      E.         .         .         .         .
 7 105. .         .         .       X   W      C.        .      E.         .         .         .         .
   110. .         .         .       X   W      C.        .      E.         .         .         .         .
 9 115. .         .         .   XXXXX   W      C.        .      E.         .         .         .         .
10 120. .         .         .     X     W      C.        .      E.         .         .         .         .
11 125. .         .         . X         W      C.        .      E.         .         .         .         .
   130. .         .         .   X       W      C.        .      E.         .         .         .         .
12 135. .         .         .     X     W      C.        .      E.         .         .         .         .
13 140. .       X .         .           W      C.        .      E.         .         .         .      BANK.
   145. .       X .         .           W      C.        .      E.         .         .         .         .
   150. .        X .        .           W      C.        .      E.         .         .         .         .
15 155. .         XX        .           W      C.        .      E.         .         .         .         .
16 160. .          . X      .           W      C.        .      E.         .         .         .         .
18 165. .      XX .         .           W      C.        .      E.         .         .         .      BANK.
   170. .         .         .         X W      C.        .      E.         .         .         .         .
19 175. .         .         .             X    C.        .      E.         .         .         .         .
   180. .         .         .               X  C.        .      E.         .         .         .         .
   185. .         .         .                 XC.        .      E.         .         .         .         .
20 190. .         .         .                  .X        .      E.         .         .         .         .
   195. .         .         .                  X         .      E.         .         .         .         .
21 200. .         .         .                 XC.        .      E.         .         .         .         .

NRD=       0 ELLC=  9999999.00 ELTRD=  9999999.00
```

EL(I),STA(I)

5903.10	.00	5901.20	25.80	5900.80	44.00	5901.23	81.00	5900.25	99.50
5900.70	107.00	5900.72	113.00	5900.31	116.00	5900.55	122.30	5900.23	127.00
5900.50	135.00	5898.67	141.50	5898.85	154.00	5899.00	157.00	5899.18	162.50
5898.60	164.00	5898.73	167.00	5901.27	173.00	5902.06	188.00	5901.84	200.00

1
PROFILE FOR STREAM BKDRPA Q=1030; 6.3==> DR

PLOTTED POINTS (BY PRIORITY)-E-ENERGY,W-WATER SURFACE,I-INVERT,C-CRITICAL W.S.,L-LEFT BANK,R-RIGHT BANK.M-LOWER END STA

```
ELEVATION  5895.     5900.     5905.     5910.     5915.     5920.     5925.     5930.     5935.     5940.
   SECNO   CUMDIS
                                                                                                          .
    5.00    0.  .         .         .         .       I .  WC E R .  M      .         .         .         .
            10. .         .         .         .       I . LWC ER  . M       .         .         .         .
            20. .         .         .         .      I  .LWC ER   M         .         .         .         .
            30. .         .         .         .     I   LW C E  M .         .         .         .         .
            40. .         .         .         .     I  L.WC RE M  .         .         .         .         .
            50. .         .         .         .    I  L W CREM    .         .         .         .         .
            60. .         .         .         .    I L  WCR E     .         .         .         .         .
            70. .         .         .         .   I L  WCRME      .         .         .         .         .
    6.10    80. .         .         .         .   I L  WCM E      .         .         .         .         .
            90. .         .         .         .  I L  WC.M E      .         .         .         .         .
           100. .         .         .         . I L  W CM E       .         .         .         .         .
           110. .         .         .         .I  L W CM. E       .         .         .         .         .
           120. .         .         .         .I LRW C M.E        .         .         .         .         .
    6.30   130. .         .         .         I L W C M E         .         .         .         .         .
           140. .         .         .        I.LRW C M  E         .         .         .         .         .
           150. .         .         .       I LRW C M  E.         .         .         .         .         .
           160. .         .         .      IL .W C M  E .         .         .         .         .         .
           170. .         .         .      I  W C M  E  .         .         .         .         .         .
    6.50   180. .         .         .     IL  W CM   E  .         .         .         .         .         .
           190. .         .         .     I  WRC M  E   .         .         .         .         .         .
           200. .         .         .    IL  WC M  E    .         .         .         .         .         .
           210. .         .         .    I  WRCM  E     .         .         .         .         .         .
           220. .         .         .   IL WRCM  E      .         .         .         .         .         .
           230. .         .         .  I L WRC.  E      .         .         .         .         .         .
           240. .         .         .  IL WRC . E       .         .         .         .         .         .
           250. .         .         . I L WC  .E        .         .         .         .         .         .
           260. .         .         . IL WRC  E         .         .         .         .         .         .
           270. .         .         .I L WC  E.         .         .         .         .         .         .
           280. .         .         .I LWCR E .         .         .         .         .         .         .
    7.10   290. .         .         I LW C E  .         .         .         .         .         .         .
           300. .         .        I. LWC  E  .         .         .         .         .         .         .
           310. .         .       I .LWC  E   .         .         .         .         .         .         .
           320. .         .       I LWRC  E   .         .         .         .         .         .         .
           330. .         .      I  LWC  E    .         .         .         .         .         .         .
           340. .         .     I  LWC  E     .         .         .         .         .         .         .
           350. .         .    I  LWMC  E     .         .         .         .         .         .         .
           360. .         .    I  LWC  E      .         .         .         .         .         .         .
           370. .         .   I  LWC.  E      .         .         .         .         .         .         .
           380. .         .  I  LWMC. E       .         .         .         .         .         .         .
           390. .         . I  RLWC . E       .         .         .         .         .         .         .
           400. .         . I RLWMC .E        .         .         .         .         .         .         .
           410. .         .I RLW C  .E        .         .         .         .         .         .         .
           420. .         I R LWC   E         .         .         .         .         .         .         .
           430. .        I.R LWMC  E.         .         .         .         .         .         .         .
           440. .        IR LW C   E.         .         .         .         .         .         .         .
           450. .       IR. LWC   E .         .         .         .         .         .         .         .
    7.20   460. .      IR .LW C   E .         .         .         .         .         .         .         .
```

1
07/05/90 05:10:08

THIS RUN EXECUTED 07/05/90 05:10:55

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*****************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55,56
  IBM-PC-XT VERSION
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NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

BKDRPA Q=1030; 6.3==> DR

SUMMARY PRINTOUT

	SECNO	XLCH	K*CHSL	ELMIN	DEPTH	CWSEL	CRIWS	AREA	TOPWID	VCH	HV	EG
	5.000	.00	.00	5914.10	2.44	5916.54	5917.17	106.77	115.53	10.53	1.62	5918.16
	6.100	75.00	-28.80	5911.94	2.48	5914.42	5915.08	104.36	72.10	12.99	2.11	5916.54
DRIVE	6.300	52.00	-41.16	5909.80	2.18	5911.98	5912.98	76.01	53.69	14.62	3.24	5915.23
	6.500	46.00	-36.08	5908.14	1.73	5909.87	5910.84	69.57	58.72	15.40	3.60	5913.47
	7.100	113.00	-28.67	5904.90	1.74	5906.64	5907.29	96.11	96.68	11.37	1.97	5908.61
	7.200	170.00	-37.06	5898.60	2.42	5901.02	5901.86	99.91	117.44	14.86	2.83	5903.85

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07/05/90 05:10:08 PAGE 6

SUMMARY OF ERRORS AND SPECIAL NOTES

1
07/05/90 05:10:56 PAGE 1

THIS RUN EXECUTED 07/05/90 05:10:56

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  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55,56
  IBM-PC-XT VERSION
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PLAN/PLATS

ON

FILE