

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

**WHITE TANKS WASH
FLOOD INSURANCE STUDY**

FCD 90-64

HYDROLOGIC ANALYSIS

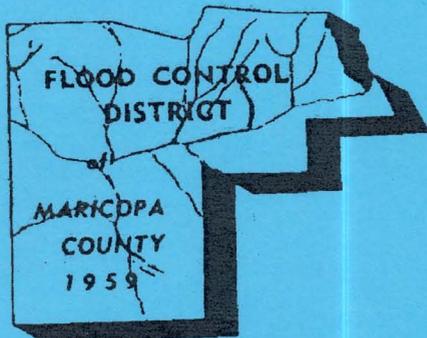
BOOK A



Peter H. Hemingway

PREPARED BY:

Harding Lawson Associates, Inc.
Alpha Engineering Group
2800 North 44th Street, Suite 500
Phoenix, Arizona 85013
602/954-0436



January 30, 1996

Harding Lawson Associates
Infrastructure, Inc.

Alpha Engineering Group



January 31, 1996

Property of
Flood Control District of MC Library
Please Return to
2801 W. Durango
Phoenix, AZ 85009

Mr. Timothy M. Murphy
Hydrologist
Flood Control District of Maricopa County
2801 West Durango
Phoenix, AZ 85009

**SUBJECT: WHITE TANKS WASH FLOOD INSURANCE STUDY
FINAL REPORT**

17777.OVR

Dear Mr. Murphy:

Enclosed is the Final Reports (Books A, B and C), Flood Insurance Study Work Maps and Flood Profiles for submittal to the Federal Emergency Management Agency (FEMA). Books A and B were previously approved and have not been modified since the last submittal except to update the table of contents. The work maps, profiles and Book C were revised to reflect the comments you provided in December 1995.

The required FEMA review forms are also attached. The community acknowledgment forms will need to be signed by representatives of Maricopa County and the Town of Buckeye. You may wish to consider including copies of a recently published public notice and any additional base mapping material that you wish to have included with this physical map revision (street maps, recently revised corporate boundaries, etc.).

If you have any questions, please do not hesitate to contact us.

Sincerely,

HARDING LAWSON ASSOCIATES


Mark E. Forest, P.E.
Associate Engineer


Peter H. Hemingway, P.E.
Managing Principal

enclosure: Final Report (Books A, B and C)
Work maps and profiles
FEMA review forms

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

**WHITE TANKS WASH
FLOOD INSURANCE STUDY**

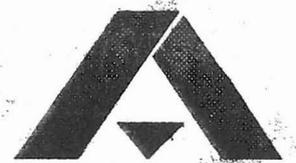
FCD 90-64

HYDROLOGIC ANALYSIS

BOOK A

PREPARED BY:

**Harding Lawson Associates, Inc.
Alpha Engineering Group
2800 North 44th Street, Suite 500
Phoenix, ASRiozna 85013
602/954-0436**



January 30, 1996

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 2.13 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and reviewing the form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden, to: Information Collections Management, Federal Emergency Management Agency, 500 C Street, S.W., Washington, DC 20472; and to the Office of Management and Budget, Paperwork Reduction Project (3067-0148), Washington, DC 20503.

1. OVERVIEW

1. The basis for this revision request is (are): (check all that apply)

- Physical change
 - Existing
 - Proposed
- Improved methodology
- Improved data
- Floodway revision
- Other Flood Insurance Study for Previously Unstudied Area

Explain _____

2. Flooding Source: White Tanks Wash and Tributaries

3. Project Name/Identifier: White Tanks Wash Flood Insurance Study

4. FEMA zone designations affected: X
 (example: A, AH, AO, A1-A30, A99, AE, V, V1-30, VE, B, C, D, X)

5. The NFIP map panel(s) affected for all impacted communities is (are):

Community No.	Community Name	County	State	Map No.	Panel No.	Effective Date
EX: 480301	Katy, City	Harris, Fort Bend	TX	480301	0005D	02/08/83
480287	Harris County	Harris	TX	48201C	0220G	09/28/90
040037	Maricopa County	Maricopa County	AZ	04013C	2025E	09/04/91
040039	Buckeye, Town	Maricopa County	AZ	04013C	2025E	09/04/91
040037	Maricopa County	Maricopa County	AZ	04013C	1550F	12/03/93
040039	Buckeye, Town	Maricopa County	AZ	04013C	1550F	12/03/93

6. The area of revision encompasses the following types of flooding, structures, and associated disciplines: (check all that apply)

- | | | |
|---|---|---|
| <p>Types of Flooding</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Riverine <input type="checkbox"/> Coastal <input type="checkbox"/> Alluvial Fan <input type="checkbox"/> Shallow Flooding (e.g. Zones AO and AH) <input type="checkbox"/> Lakes <p>Affected by wind/wave action</p> <ul style="list-style-type: none"> <input type="checkbox"/> Yes <input type="checkbox"/> No | <p>Structures</p> <ul style="list-style-type: none"> <input type="checkbox"/> Channelization <input type="checkbox"/> Levee/Floodwall <input type="checkbox"/> Bridge/Culvert <input type="checkbox"/> Dam <input type="checkbox"/> Coastal <input type="checkbox"/> Fill <input type="checkbox"/> Pump Station <input type="checkbox"/> None <input type="checkbox"/> Channel Relocation <input type="checkbox"/> Excavation <input type="checkbox"/> Other (describe) | <p>Disciplines*</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Water Resources <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Hydrology <input checked="" type="checkbox"/> Hydraulics <input type="checkbox"/> Sediment Transport <input type="checkbox"/> Interior Drainage <input type="checkbox"/> Structural <input type="checkbox"/> Geotechnical <input checked="" type="checkbox"/> Land Surveying <input type="checkbox"/> Other (describe) |
|---|---|---|

Other (describe) _____

* Attach completed "Certification by Registered Professional Engineer and/or Land Surveyor" Form for each discipline checked. (Form 2)

2. FLOODWAY INFORMATION

7. Does the affected flooding source have a floodway designated on the effective FIRM or FBFM? Yes No
8. Does the revised floodway delineation differ from that shown on the effective FIRM or FBFM? Yes No
- If yes, give reason: New Study

Attach copy of either a public notice distributed by the community stating the community's intent to revise the floodway or a statement by the community that it has notified all affected property owners and affected adjacent jurisdictions.

9. Does the State have jurisdiction over the floodway or its adoption by communities participating in the NFIP?

Yes No

If yes, attach a copy of a letter notifying the appropriate State agency of the floodway revision and documentation of the approval of the revised floodway by the appropriate State agency.

3. PROPOSED ENCROACHMENTS

10. With floodways:

1A. Does the revision request involve fill, new construction, substantial improvement, or other development in the floodway? Yes No

1B. If yes, does the development cause the 100-year water surface elevation to increase at any location by more than 0.000 feet? Yes No

11. Without floodways:

2A. Does the revision request involve fill, new construction, substantial improvement, or other development in the 100-year floodplain? Yes No

2B. If yes, does the cumulative effect of all development that has occurred since the effective SFHA was originally identified cause the 100-year water surface elevation to increase at any location by more than one foot (or other surcharge limit if community or state has adopted more stringent criteria)? Yes No

If the answer to either Items 1B or 2B is yes, please provide documentation that all requirements of Section 65.12 of the NFIP regulations have been met, regarding evaluation of alternatives, notice to individual legal property owners, concurrence of CEO, and certification that no insurable structures are impacted.

4. REVISION REQUESTOR ACKNOWLEDGMENT

12. Having read NFIP Regulations, 44 CFR Ch. I, parts 59, 60, 61, and 72, I believe that the proposed revision is is not in compliance with the requirements of the aforementioned NFIP Regulations.

5. COMMUNITY OFFICIAL ACKNOWLEDGMENT

13. Was this revision request reviewed by the community for compliance with the community's adopted floodplain management ordinances? Yes No

14. Does this revision request have the endorsement of the community? Yes No

If no to either of the above questions, please explain: _____

Please note that community acknowledgment and /or notification is required for all requests as outlined in Section 65.4 (b) of the NFIP Regulations.

6. OPERATION AND MAINTENANCE

15. Does the physical change involve a flood control structure (e.g., levees, floodwalls, channelization, basins, dams)? Yes No

If yes, please provide the following information for each of the new flood control structures:

A. Inspection of the flood control project will be conducted periodically by _____ entity

_____ with a maximum interval of _____ months between inspections.

B. Based on the results of scheduled periodic inspections, appropriate maintenance of the flood control facilities will be conducted by _____

(entity)

to ensure the integrity and degree of flood protection of the structure.

C. A formal plan of operation, including documentation of the flood warning system, specific actions and assignments of responsibility by individual name or title, and provisions for testing the plan at intervals not less than one year, has has not been prepared for the flood control structure.

D. The community is willing to assume responsibility for performing overseeing compliance with the maintenance and operation plans of the N/A (Name)

flood control structure. If not performed promptly by an owner other than the community, the community will provide the necessary services without cost to the Federal government.

Attach operation and maintenance plans

7. REQUESTED RESPONSE FROM FEMA

16. After examining the pertinent NFIP regulations and reviewing the document entitled "Appeals, Revisions, and Amendments to Flood Insurance Maps: A guide for Community Officials," dated January 1990, this request is for a:

- a. CLOMR A letter from FEMA commenting on whether a proposed project, if built as proposed, would justify a map revision (LOMR or PMR), or proposed hydrology changes (see 44 CFR Ch. I, Parts 60, 65, and 72).
- b. LOMR A letter from FEMA officially revising the current NFIP map to show changes to floodplains, floodways, or flood elevations. LOMRs typically depict decreased flood hazards. (See 44 CFR Ch. I Parts 60 and 65.)
- c. PMR A reprinted NFIP map incorporating changes to floodplains, floodways, or flood elevations. Because of the time and cost involved to change, reprint, and redistribute an NFIP map, a PMR is usually processed when a revision reflects increased flood hazards or large-scope changes. (See 44 CFR Ch. I, Parts 60 and 65.)
- d. Other: Describe Physical Map Revision Based Upon New Flood Insurance Study

8. FORMS INCLUDED

7. Form 2 entitled, "Certification By Registered Professional Engineer and/or Land Surveyor" must be submitted.

The following forms should be included with this request if (check the included forms):

- Hydrologic analysis for flooding source differs from that used to develop FIRM Hydrologic Analysis Form (Form 3)
- Hydraulic analysis for riverine flooding differs from that used to develop FIRM Riverine Hydraulic Analysis Form (Form 4)
- The request is based on updated topographic information or a revised floodplain or floodway delineation is requested Riverine /Coastal Mapping Form (Form 5)
- The request involves any type of channel modification Channelization Form (Form 6)
- The request involves new bridge or culvert or revised analysis of an existing bridge or culvert Bridge/Culvert Form (Form 7)
- The request involves a new revised levee/floodwall system Levee/Floodwall System Analysis Form (Form 8)
- The request involves analysis of coastal flooding Coastal Analysis Form (Form 9)
- The request involves coastal structures credited as providing protection from the 100-year flood Coastal Structures (Form 10)
- The request involves an existing, proposed, or modified dam Dam Form (Form 11)
- The request involves structures credited as providing protection from the 100-year flood on an alluvial fan Alluvial Fan Flooding Form (Form 12)

9. INITIAL REVIEW FEE

18. The minimum initial review fee for the appropriate request category has been included. Yes No

Initial fee amount: \$ _____

Check or money order only. Make check or money order payable to : **National Flood Insurance Program**. If paying by Visa or Mastercard please refer to the credit card information form which follows this form.

or

19. This request is for a project that is for public benefit and is primarily intended for flood loss reduction to insurable structures in identified flood hazard areas which were in existence prior to the commencement of construction of the flood control project. Yes No

or

20. This request is to correct map errors, to include the effects of natural changes within the areas of special flood hazard, or solely to provide more detailed data. Yes No

Note: I understand that my signature indicates that all information submitted in support of this request is correct.

Signature of Revision Requester

Mark E. Forest, P.E., Associate Engineer

Printed Name and Title of Revision Requester

Harding Lawson Associates
Infrastructure, Inc.
Alpha Engineering Group

Company Name

(702) 329-6123

Telephone No.

1/31/96

Date

Note: Signature indicates that the community understands, from the revision requester, the impacts of the revision on flooding conditions in the community.

Signature of Community Official

Printed Name and Title of Community Official

Maricopa County

Community Name

Date

Does this request impact any other communities? Yes No

If yes, attach letters from all affected jurisdictions acknowledging revision request and approving changes to floodway, if applicable.

Note: Although a photograph of physical changes is not required, it may be helpful for FEMA's review.

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 2.13 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and reviewing the form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden, to: Information Collections Management, Federal Emergency Management Agency, 500 C Street, S.W., Washington, DC 20472; and to the Office of Management and Budget, Paperwork Reduction Project (3067-0148), Washington, DC 20503.

1. OVERVIEW

1. The basis for this revision request is (are): *(check all that apply)*

- Physical change
 - Existing
 - Proposed
- Improved methodology
- Improved data
- Floodway revision
- Other Flood Insurance Study for Previously Unstudied Area

Explain _____

2. Flooding Source: White Tanks Wash and Tributaries

3. Project Name/Identifier: White Tanks Wash Flood Insurance Study

4. FEMA zone designations affected: X

(example: A, AH, AO, A1-A30, A99, AE, V, V1-30, VE, B, C, D, X)

5. The NFIP map panel(s) affected for all impacted communities is (are):

Community No.	Community Name	County	State	Map No.	Panel No.	Effective Date
EX: 480301	Katy, City	Harris, Fort Bend	TX	480301	0005D	02/08/83
480287	Harris County	Harris	TX	48201C	0220G	09/28/90
040037	Maricopa County	Maricopa County	AZ	04013C	2025E	09/04/91
040039	Buckeye, Town	Maricopa County	AZ	04013C	2025E	09/04/91
040037	Maricopa County	Maricopa County	AZ	04013C	1550F	12/03/93
040039	Buckeye, Town	Maricopa County	AZ	04013C	1550F	12/03/93

6. The area of revision encompasses the following types of flooding, structures, and associated disciplines: *(check all that apply)*

Types of Flooding

- Riverine
- Coastal
- Alluvial Fan
- Shallow Flooding (e.g. Zones AO and AH)
- Lakes

Affected by wind/wave action

- Yes
- No

Structures

- Channelization
- Levee/Floodwall
- Bridge/Culvert
- Dam
- Coastal
- Fill
- Pump Station
- None
- Channel Relocation
- Excavation
- Other (describe)

Disciplines*

- Water Resources
 - Hydrology
 - Hydraulics
 - Sediment Transport
 - Interior Drainage
- Structural
- Geotechnical
- Land Surveying
- Other (describe)

Other (describe) _____

* Attach completed "Certification by Registered Professional Engineer and/or Land Surveyor" Form for each discipline checked. (Form 2)

2. FLOODWAY INFORMATION

7. Does the affected flooding source have a floodway designated on the effective FIRM or FBFM? Yes No

8. Does the revised floodway delineation differ from that shown on the effective FIRM or FBFM Yes No

If yes, give reason: New Study

Attach copy of either a public notice distributed by the community stating the community's intent to revise the floodway or a statement by the community that it has notified all affected property owners and affected adjacent jurisdictions.

9. Does the State have jurisdiction over the floodway or its adoption by communities participating in the NFIP? Yes No

If yes, attach a copy of a letter notifying the appropriate State agency of the floodway revision and documentation of the approval of the revised floodway by the appropriate State agency.

3. PROPOSED ENCROACHMENTS

10. With floodways:

1A. Does the revision request involve fill, new construction, substantial improvement, or other development in the floodway? Yes No

1B. If yes, does the development cause the 100-year water surface elevation to increase at any location by more than 0.000 feet? Yes No

11. Without floodways:

2A. Does the revision request involve fill, new construction, substantial improvement, or other development in the 100-year floodplain? Yes No

2B. If yes, does the cumulative effect of all development that has occurred since the effective SFHA was originally identified cause the 100-year water surface elevation to increase at any location by more than one foot (or other surcharge limit if community or state has adopted more stringent criteria)? Yes No

If the answer to either Items 1B or 2B is yes, please provide documentation that all requirements of Section 65.12 of the NFIP regulations have been met, regarding evaluation of alternatives, notice to individual legal property owners, concurrence of CEO, and certification that no insurable structures are impacted.

4. REVISION REQUESTOR ACKNOWLEDGMENT

12. Having read NFIP Regulations, 44 CFR Ch. I, parts 59, 60, 61, and 72, I believe that the proposed revision is is not in compliance with the requirements of the aforementioned NFIP Regulations.

5. COMMUNITY OFFICIAL ACKNOWLEDGMENT

13. Was this revision request reviewed by the community for compliance with the community's adopted floodplain management ordinances? Yes No

14. Does this revision request have the endorsement of the community? Yes No

If no to either of the above questions, please explain: _____

Please note that community acknowledgment and /or notification is required for all requests as outlined in Section 65.4 (b) of the NFIP Regulations.

6. OPERATION AND MAINTENANCE

15. Does the physical change involve a flood control structure (e.g., levees, floodwalls, channelization, basins, dams)? Yes No

If yes, please provide the following information for each of the new flood control structures:

A. Inspection of the flood control project will be conducted periodically by _____ entity
_____ with a maximum interval of _____ months between inspections.

B. Based on the results of scheduled periodic inspections, appropriate maintenance of the flood control facilities will be conducted by _____ (entity)

to ensure the integrity and degree of flood protection of the structure.

C. A formal plan of operation, including documentation of the flood warning system, specific actions and assignments of responsibility by individual name or title, and provisions for testing the plan at intervals not less than one year, has has not been prepared for the flood control structure.

D. The community is willing to assume responsibility for performing overseeing compliance with the maintenance and operation plans of the N/A _____
(Name)

flood control structure. If not performed promptly by an owner other than the community, the community will provide the necessary services without cost to the Federal government.

Attach operation and maintenance plans

7. REQUESTED RESPONSE FROM FEMA

16. After examining the pertinent NFIP regulations and reviewing the document entitled "Appeals, Revisions, and Amendments to Flood Insurance Maps: A guide for Community Officials," dated January 1990, this request is for a:

- a. CLOMR A letter from FEMA commenting on whether a proposed project, if built as proposed, would justify a map revision (LOMR or PMR), or proposed hydrology changes (see 44 CFR Ch. I, Parts 60, 65, and 72).
- b. LOMR A letter from FEMA officially revising the current NFIP map to show changes to floodplains, floodways, or flood elevations. LOMRs typically depict decreased flood hazards. (See 44 CFR Ch. I Parts 60 and 65.)
- c. PMR A reprinted NFIP map incorporating changes to floodplains, floodways, or flood elevations. Because of the time and cost involved to change, reprint, and redistribute an NFIP map, a PMR is usually processed when a revision reflects increased flood hazards or large-scope changes. (See 44 CFR Ch. I, Parts 60 and 65.)
- d. Other: Describe Physical Map Revision Based Upon New Flood Insurance Study

8. FORMS INCLUDED

7. Form 2 entitled, "Certification By Registered Professional Engineer and/or Land Surveyor" must be submitted.

The following forms should be included with this request if (check the included forms):

- Hydrologic analysis for flooding source differs from that used to develop FIRM Hydrologic Analysis Form (Form 3)
- Hydraulic analysis for riverine flooding differs from that used to develop FIRM Riverine Hydraulic Analysis Form (Form 4)
- The request is based on updated topographic information or a revised floodplain or floodway delineation is requested Riverine /Coastal Mapping Form (Form 5)
- The request involves any type of channel modification Channelization Form (Form 6)
- The request involves new bridge or culvert or revised analysis of an existing bridge or culvert Bridge/Culvert Form (Form 7)
- The request involves a new revised levee/floodwall system Levee/Floodwall System Analysis Form (Form 8)
- The request involves analysis of coastal flooding Coastal Analysis Form (Form 9)
- The request involves coastal structures credited as providing protection from the 100-year flood Coastal Structures (Form 10)
- The request involves an existing, proposed, or modified dam Dam Form (Form 11)
- The request involves structures credited as providing protection from the 100-year flood on an alluvial fan Alluvial Fan Flooding Form (Form 12)

9. INITIAL REVIEW FEE

18. The minimum initial review fee for the appropriate request category has been included. Yes No

Initial fee amount: \$ _____

Check or money order only. Make check or money order payable to : **National Flood Insurance Program**. If paying by Visa or Mastercard please refer to the credit card information form which follows this form.

or

19. This request is for a project that is for public benefit and is primarily intended for flood loss reduction to insurable structures in identified flood hazard areas which were in existence prior to the commencement of construction of the flood control project. Yes No

or

20. This request is to correct map errors, to include the effects of natural changes within the areas of special flood hazard, or solely to provide more detailed data. Yes No

Note: I understand that my signature indicates that all information submitted in support of this request is correct.

Signature of Revision Requester

Mark E. Forest, P.E., Associate Engineer

Printed Name and Title of Revision Requester

Harding Lawson Associates
Infrastructure, Inc.
Alpha Engineering Group

Company Name

(702) 329-6123

1/31/96

Telephone No.

Date

Note: Signature indicates that the community understands, from the revision requester, the impacts of the revision on flooding conditions in the community.

Signature of Community Official

Printed Name and Title of Community Official

Town of Buckeye

Community Name

Date

Does this request impact any other communities? Yes No

If yes, attach letters from all affected jurisdictions acknowledging revision request and approving changes to floodway, if applicable.

Note: Although a photograph of physical changes is not required, it may be helpful for FEMA's review.

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average .23 hour per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and reviewing the form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden, to: Information Collections Management, Federal Emergency Management Agency, 500 C Street, S.W., Washington, DC 20472; and to the Office of Management and Budget, Paperwork Reduction Project (3067-0148), Washington, DC 20503.

1. This certification is in accordance with 44 CFR Ch. I, Section 65.2
2. I am licensed with an expertise in Water Resources (Hydrology, Hydraulics, Drainage Design)
[example: water resources (*hydrology, hydraulics, sediment transport, interior drainage*)* structural, geotechnical, land surveying.]
3. I have 15 years experience in the expertise listed above.
4. I have prepared reviewed the attached supporting data and analyses related to my expertise.
5. I have have not visited and physically viewed the project.
6. In my opinion, the following analyses and /or designs, is/are being certified:
Flood Insurance Study Hydrologic and Hydraulic Data and Work Maps
7. Base upon the following review, the modifications in place have been constructed in general accordance with plans and specifications.

Basis for above statement: (check all that apply)

 - a. Viewed all phases of actual construction.
 - b. Compared plans and specifications with as-built survey information.
 - c. Examined plans and specifications and compared with completed projects.
 - d. Other _____
8. All information submitted in support of this request is correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Name: Mark E. Forest, P.E. (please print or type)

Title: Associate Engineer (please print or type)

Registration No. 26129 Expiration Date: 03/31/98

State Arizona

Type of License Civil Engineer

Mark Forest
Signature

January 31, 1996
Date



Seal (Optional)

*Specify Subdiscipline

Note: Insert not applicable (N/A) when statement does not apply.

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 3.67 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and reviewing the form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden, to: Information Collections Management, Federal Emergency Management Agency, 500 C Street, S.W., Washington, DC 20472; and to the Office of Management and Budget, Paperwork Reduction Project (3067-0148), Washington, DC 20503.

Community Name: Maricopa County and Town of Buckeye, Arizona

Flooding Source: White Tanks Wash
(One form for each flooding source)

Project Name /Identifier: White Tanks Wash Flood Insurance Study

1. HYDROLOGIC ANALYSIS IN FIS

- Approximate study stream (Zone A)
- Detailed study stream (briefly explain methodology) Analysis Performed Using HEC-1 and Flood Control District of Maricopa County Hydrology Manual Procedures

2. REASON FOR NEW HYDROLOGIC ANALYSIS

- No existing analysis
- Improved data (see data revision on page 3)
- Changed physical conditions of watershed (explain) _____

- Alternative methodology (justify why the revised model is better than model used in the effective FIS)

- Evaluation of proposed conditions (CLOMRs only) (explain) _____

- Other _____

If a computer program/model was used in revising the hydrologic analysis, please provide a diskette with the input files for the 10-, 50-, 100 - and 500-year recurrence intervals.

Only the 100-year recurrence interval need be included for SFHAs designated as Zone A.

3. APPROVAL OF ANALYSIS

- Approval of hydrologic analysis, including the resulting peak discharge value (s) has been provided by the appropriate local, state, or Federal Agency. (i.e., Flood Control District of Maricopa County)

Attach evidence of approval.
- Approval of the hydrologic analysis is not required by any local, State, or Federal Agency.

4. REVIEW OF RESULTS

Stream: White Tanks Wash

Comparison of 100-year Discharges

Location:	Drainage area (Sq mi.)	FIS (cfs):	Revised (cfs):
At Buckeye Flood Control Structure	29.50	N/A	7209
At Confluence w/Tributary #1	13.83	N/A	6208
Below Sun Valley Parkway	2.97	N/A	2729
_____	_____	_____	_____
_____	_____	_____	_____

Note: When revised discharges are not significantly different than FIS discharges, FEMA may require a confidence limits analysis on attachment D at a later date to complete the review. (See Section 1.4, Book A)

As is often the case with revision requests, only a portion of a stream may actually be revised or be affected by a revision. Therefore, transition to the unrevised portion is important to maintain the continuity of the study. NFIP regulations stipulate that such a transition must be assured. What is the transition from the proposed discharges to the effective discharges? Please explain how the transition was made (*attach separate sheet if necessary*)

This is a new FIS for a previously unstudied area. The report (Book A) describes the Public Noticing Procedures used to advise land owners of the pending study.

ATTACH A COMPLETED REVIEW OF RESULTS PAGE FOR EACH FLOODING SOURCE.

Is the new hydrologic analysis being developed solely to revise the flow values presented in the FIS (*i.e. no changed hydraulic conditions*)? Yes No

If yes, does the 100-year water surface elevation change by 1.0 foot or more? Yes No

FEMA does not normally revise NFIP maps solely due to insignificant flow changes where changes in 100-year water surface elevation are less than 1.0 foot.

5. HISTORICAL FLOODING INFORMATION

Is historical data available for the flooding source? Yes No

If yes, provide the following:

Location along flooding source: _____

Maximum peak discharge: _____ cfs

Second highest peak discharge: _____ cfs

Source of information: _____

6. GAGE RECORD INFORMATION

Location of nearest gage to project site (along flooding source or similar watershed; specify) Salt River Tributary at South Mountain Park Section 1.4, Book A describes available Gage and Data Results

Gaging Station: _____

Drainage area at gage: _____ mi²

Number of years of data: _____

7. DATA REVISION

Please use the following table to list all the data and/or parameters affected by this request and identify them as new data (*New*) or as revising existing data (*Revised*). (If necessary, attach a separate sheet.)

No previous analysis - See Book B for description of data sources

Data Parameter	New	Revised	Data Source
_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
_____	<input type="checkbox"/>	<input type="checkbox"/>	_____

- Data source can be from a Federal, State, or local government agency, or from a private source. Some State and local governments may have less strict data requirements than Federal agencies, in which case the hydrologic data may not be accepted by FEMA unless it is demonstrated that the data give a better estimate of the flood discharge.
- Attach documentation corroborating each data source (i.e., certified statement, report, bibliographical reference to a published document). In the case of a published document or a government report, providing copies of the cover and pertinent pages may be helpful.

8. METHODOLOGY FOR NEW ANALYSIS

- Statistical Analysis of Gage Records (use Attachment A)
- Regional Regression Equations (use Attachment B)
- Precipitation/Runoff Model (use Attachment C) Book B (Attached)
- Other (specify; attach backup computations and supporting data) _____

ATTACHMENT A: STATISTICAL ANALYSIS OF GAGE RECORDS

Gaging Station: N/A

Gage Location (latitude and longitude): _____

	FIS:	Revised:
1. Number of years of data	_____	_____
Systematic	_____	_____
Historical	_____	_____
2. Homogeneous data	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
3. Data adjustments	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
4. Number of high outliers	_____	_____
Low outliers	_____	_____
Zero events	_____	_____
5. Generalized skew	_____	_____
6. Station skew	_____	_____
7. Adopted skew	_____	_____
8. Probability distribution used (justify if log-Pearson III was not used)	_____	_____
9. Transfer equations to ungaged sites		<input type="checkbox"/> Yes <input type="checkbox"/> No
If yes, specify method	_____	
_____	_____	
_____	_____	
10. Expected probability*	<input type="checkbox"/> Yes <input type="checkbox"/> No	
11. Comparison of results with other analyses	<input type="checkbox"/> Yes <input type="checkbox"/> No	
If yes, describe comparison	_____	
_____	_____	
_____	_____	

***FEMA does not accept expected probability analyses for the purpose of reflecting flood hazard information in a FIS.**

If any data is not available, indicate by N/A.

Attach analysis including plot of flood frequency curve.

ATTACHMENT B: REGIONAL REGRESSION EQUATIONS

1. **Bibliographical Reference:**

(Attach a copy of title page, table of contents, and pertinent pages including equations.)

2. **Gaged or ungaged stream:** _____

3. **Hydrologic region(s):** _____

Attach backup map.

4. **Provide parameters, values, and source of data used to define parameters.**

- | | FIS: | | Revised: | |
|---|------------------------------|-----------------------------|------------------------------|-----------------------------|
| 5. Urbanized conditions calculations | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 6. Percent of watershed urbanization | _____ | | _____ | |
| 7. Is the watershed controlled? | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 8. Comparison with other analyses | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

If the answer to 5, 7, or 8 is yes, explain methodology in Comments.

If data is not available, indicate by N/A.

Comments

Attach computation and supporting maps, delineating the watershed boundary and drainage area divides.

ATTACHMENT C: PRECIPITATION/RUNOFF MODEL

	FIS:	Revised
1. Method or model used:	N/A	HEC-1
Version:	N/A	4.0
Date:	N/A	9/90
2. Source of rainfall depth:		
3. Source of rainfall distribution:		NOAA-Atlas 2
4. Rainfall duration:		24 Hr
5. Areal adjustment to precipitation (%):		Varies
6. Maximum overland flow length		
7. Hydrograph development method:		UH Methods Used
8. Loss rate method:		Green-Ampt
Source of soils information:		OSCS Soil Survey
Source of land use information		Aerial Photos
9. Channel routing method:		Muskingum
10. Reservoir routing:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
11. Baseflow considerations:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
If yes, explain how baseflow was determined:		

12. Snowmelt considerations:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
13. Model calibration:	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
If yes, explain how calibration was performed <u>Comparison to Gage Data (Q/A Relationships)</u>		
and Regional Equations. See Book B.		

14. Future land use condition:		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
If yes, explain why		

NOTE: FEMA policy is to base flooding on existing conditions.
If data is not available, indicate by N/A.

Attach precipitation/runoff model, hydrologic model schematic, curve number calculations, time of concentration calculations, and supporting maps, delineating the watershed boundary and drainage area divides.

ATTACHMENT D: CONFIDENCE LIMITS EVALUATION

Stream: _____

Select one location for Confidence Limits Evaluation (describe location): _____

Discharges for selected location:

Exceedance Probability	FIS	Revised
10% (10-year)	_____ cfs	_____ cfs
2% (50-year)	_____ cfs	_____ cfs
1% (100-year)	_____ cfs	_____ cfs
0.2% (500-year)	_____ cfs	_____ cfs

1% (100-year) Flood Confidence Intervals

90% Confidence Interval:	5% limit _____	cfs
	95% limit _____	cfs
50% Confidence Interval:	25% limit _____	cfs
	75% limit _____	cfs

If the value of the 100-year frequency flood in the FIS is beyond the 50% confidence interval but within the 90% confidence interval, does the 100-year water surface elevation change by 1.0 foot or more? Yes No

An example of confidence limits analysis can be found in Appendix 9 of Bulletin 17B.

Attach Confidence Limits Analysis.

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 3.67 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and reviewing the form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden, to: Information Collections Management, Federal Emergency Management Agency, 500 C Street, S.W., Washington, DC 20472; and to the Office of Management and Budget, Paperwork Reduction Project (3067-0148), Washington, DC 20503.

Community Name: Maricopa County and Town of Buckeye, Arizona

Flooding Source: White Tanks Wash Tributary #1
(One form for each flooding source)

Project Name /Identifier: White Tanks Wash Flood Insurance Study

1. HYDROLOGIC ANALYSIS IN FIS

- Approximate study stream (Zone A)
- Detailed study stream (briefly explain methodology) Analysis Performed using HEC-1 and Flood Control District of Maricopa County Hydrology Manual Procedures

2. REASON FOR NEW HYDROLOGIC ANALYSIS

- No existing analysis
- Improved data (see data revision on page 3)
- Changed physical conditions of watershed (explain) _____
- Alternative methodology (justify why the revised model is better than model used in the effective FIS) _____
- Evaluation of proposed conditions (CLOMRs only) (explain) _____
- Other _____

If a computer program/model was used in revising the hydrologic analysis, please provide a diskette with the input files for the 10-, 50-, 100 - and 500-year recurrence intervals.

Only the 100-year recurrence interval need be included for SFHAs designated as Zone A.

3. APPROVAL OF ANALYSIS

- Approval of hydrologic analysis, including the resulting peak discharge value (s) has been provided by the appropriate local, state, or Federal Agency. (i.e., Flood Control District of Maricopa County)
Attach evidence of approval.
- Approval of the hydrologic analysis is not required by any local, State, or Federal Agency.

4. REVIEW OF RESULTS

Stream: White Tanks Wash Tributary #1

Comparison of 100-year Discharges

Location:	Drainage area (Sq mi.)	FIS (cfs):	Revised (cfs):
<u>Above Confluence w/White</u>	<u>1.06</u>	<u> </u>	<u>818</u>
<u>Tanks Wash</u>	<u> </u>	<u> </u>	<u> </u>
<u> </u>	<u> </u>	<u> </u>	<u> </u>
<u> </u>	<u> </u>	<u> </u>	<u> </u>

Note: When revised discharges are not significantly different than FIS discharges, FEMA may require a confidence limits analysis on attachment D at a later date to complete the review. (See Section 1.4, Book A)

As is often the case with revision requests, only a portion of a stream may actually be revised or be affected by a revision. Therefore, transition to the unrevised portion is important to maintain the continuity of the study. NFIP regulations stipulate that such a transition must be assured. What is the transition from the proposed discharges to the effective discharges? Please explain how the transition was made (*attach separate sheet if necessary*)

This is a new FIS for a previously unstudied area. The report (Book A) describes the
Public Noticing Procedures used to advise land owners of the pending study.

ATTACH A COMPLETED REVIEW OF RESULTS PAGE FOR EACH FLOODING SOURCE:

Is the new hydrologic analysis being developed solely to revise the flow values presented in the FIS (*i.e. no changed hydraulic conditions*)? Yes No

If yes, does the 100-year water surface elevation change by 1.0 foot or more? Yes No

FEMA does not normally revise NFIP maps solely due to insignificant flow changes where changes in 100-year water surface elevation are less than 1.0 foot.

5. HISTORICAL FLOODING INFORMATION

Is historical data available for the flooding source? Yes No
 If yes, provide the following:

Location along flooding source: _____
 Maximum peak discharge: _____ cfs
 Second highest peak discharge: _____ cfs
 Source of information: _____

6. GAGE RECORD INFORMATION

Location of nearest gage to project site (along flooding source or similar watershed; specify) Salt River
 Tributary at South Mountain Park Section 1.4, Book A describes available Gage Data and
 Results

Gaging Station: _____
 Drainage area at gage: _____ mi²
 Number of years of data: _____

7. DATA REVISION

Please use the following table to list all the data and/or parameters affected by this request and identify them as
 new data (*New*) or as revising existing data (*Revised*). (If necessary, attach a separate sheet.)

No previous analysis - See Book B for description of data sources

Data Parameter	New	Revised	Data Source
_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
_____	<input type="checkbox"/>	<input type="checkbox"/>	_____

- Data source can be from a Federal, State, or local government agency, or from a private source. Some State and local governments may have less strict data requirements than Federal agencies, in which case the hydrologic data may not be accepted by FEMA unless it is demonstrated that the data give a better estimate of the flood discharge.
- Attach documentation corroborating each data source (i.e., certified statement, report, bibliographical reference to a published document). In the case of a published document or a government report, providing copies of the cover and pertinent pages may be helpful.

8. METHODOLOGY FOR NEW ANALYSIS

- Statistical Analysis of Gage Records (use Attachment A)
- Regional Regression Equations (use Attachment B)
- Precipitation/Runoff Model (use Attachment C) Book B (Attached)
- Other (specify; attach backup computations and supporting data) _____

ATTACHMENT B: REGIONAL REGRESSION EQUATIONS

1. Bibliographical Reference:

(Attach a copy of title page, table of contents, and pertinent pages including equations.)

2. Gaged or ungaged stream:

3. Hydrologic region(s):

Attach backup map.

4. Provide parameters, values, and source of data used to define parameters.

- | | FIS: | | Revised: | |
|--|------------------------------|-----------------------------|------------------------------|-----------------------------|
| 5. Urbanized conditions calculations | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 6. Percent of watershed urbanization | | _____ | | _____ |
| 7. Is the watershed controlled? | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 8. Comparison with other analyses | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

If the answer to 5, 7, or 8 is yes, explain methodology in Comments.

If data is not available, indicate by N/A.

Comments

Attach computation and supporting maps, delineating the watershed boundary and drainage area divides.

ATTACHMENT C: PRECIPITATION/RUNOFF MODEL

	FIS:	Revised
1. Method or model used:	N/A	HEC-1
Version:	N/A	4.0
Date:	N/A	9/90
2. Source of rainfall depth:		
3. Source of rainfall distribution:		NOAA-Atlas 2
4. Rainfall duration:		24 Hr
5. Areal adjustment to precipitation (%):		Varies
6. Maximum overland flow length		
7. Hydrograph development method:		UH Methods Used
8. Loss rate method:		Green-Ampt
Source of soils information:		OSCS Soil Survey
Source of land use information		Aerial Photos
9. Channel routing method:		Muskingum
10. Reservoir routing:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
11. Baseflow considerations:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
If yes, explain how baseflow was determined:		

12. Snowmelt considerations:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
13. Model calibration:	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
If yes, explain how calibration was performed <u>Comparison to Gage Data (Q/A Relationships)</u> and Regional Equations. See Book B.		

14. Future land use condition:		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
If yes, explain why		

NOTE: FEMA policy is to base flooding on existing conditions.
If data is not available, indicate by N/A.

Attach precipitation/runoff model, hydrologic model schematic, curve number calculations, time of concentration calculations, and supporting maps, delineating the watershed boundary and drainage area divides.

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 2.25 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and reviewing the form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden, to: Information Collections Management, Federal Emergency Management Agency, 500 C Street, S.W., Washington, DC 20472; and to the Office of Management and Budget, Paperwork Reduction Project (3067-0148), Washington, DC 20503.

Community Name: Maricopa County and Town of Buckeye

Flooding Source: White Tanks Wash
(One form for each flooding source)

Project Name/Identifier: White Tanks Wash Flood Insurance Study

1. REACH TO BE REVISED

Downstream limit: Buckeye Flood Control Structure

Upstream limit: Sun Valley Parkway

2. EFFECTIVE FIS

- Not studied
- Studied by approximate methods
Downstream limit of study _____
Upstream limit of study _____
- Studied by detailed methods
Downstream limit of study _____
Upstream limit of study _____
- Floodway delineated
Downstream limit of Floodway _____
Upstream limit of Floodway _____

3. HYDRAULIC ANALYSIS

Why is the hydraulic analysis different from that used to develop the FIRM. *(Check all that apply)*

- Not studied in FIS
- Improved hydrologic data/analysis. Explain: _____

- Improved hydraulic analysis. Explain: _____

- Flood control structure. Explain: _____

- Other. Explain: _____

3. RIVERINE HYDRAULIC ANALYSIS FORM
Models Submitted

For areas which have detailed flooding:

Full input and output listings along with files on diskette (if available) for each of the models listed below (items 1, 2, 3, 4, and 5) and summary of the source of input parameters used in the models must be provided. The summary must include a complete description of any changes made from model to model (e.g. duplicate effective model to corrected effective model) At a minimum, the Duplicate Effective (item 1) and the Revised or Post-Project Conditions (item 4) models must be submitted. See instructions for directions on when other models may be required.

For areas which do not have detailed flooding:

Only the 100-year flood profile is required. A hydraulic model is not required for areas which do not have detailed flooding; however, BFEs may not be added to the revised FIRM. If a hydraulic model is developed for the area, items 3 and 4 described below must be submitted.

If hydraulic models are not developed, hydraulic analyses for existing or pre-project conditions and revised or post-project conditions must be submitted. All calculations must be submitted for these analyses. (See item 6 below)

1. Duplicate Effective Model

Copies of the hydraulic analysis used in the effective FIS, referred to as the effective models (*10-, 50-, 100-, and 500-year multi-profile runs and the floodway run*) must be obtained and then reproduced on the requestor's equipment to produce the duplicate effective model. This is required to assure that the effective model input data has been transferred correctly to the requestor's equipment and to assure that the revised data will be integrated into the effective data to provide a continuous FIS model upstream and downstream of the revised reach.

Natural Floodway

N/A

2. Corrected Effective Model

The corrected effective model is the model that corrects any errors that occur in the duplicate effective model, adds any additional cross sections to the duplicate effective model, or incorporates more detailed topographic information than that used in the currently effective model. The corrected effective model must not reflect any man-made physical changes since the date of the effective model. An error could be a technical error in the modeling procedures, or any construction in the floodplain that occurred prior to the date of the effective model but was not incorporated into the effective model.

Natural Floodway

N/A

3. Existing or Pre-Project Conditions Model

The duplicate effective or corrected model is modified to produce the existing or pre-project conditions model to reflect any modifications that have occurred within the floodplain since the date of the effective model but prior to the construction of the project for which the revision is being requested. If no modification has occurred since the date of the effective model, then this model would be identical to the corrected effective or duplicate effective model.

Natural Floodway

N/A

4. Revised or Post-Project Conditions Model

The existing or pre-project conditions model (or *duplicate effective or corrected effective model, as appropriate*) is revised to reflect revised or post-project conditions. This model must incorporate any physical changes to the floodplain since the effective model was produced as well as the effects of the project. When the request is for proposed project this model should reflect proposed conditions.

Natural Floodway

N/A

5. Other: Please attach a sheet describing all other models submitted.

Natural Floodway

6. Hydraulic Analyses (Only if Hydraulic Models are not developed)

Please attach all calculations for the existing or pre-project conditions and the revised or post-project conditions. Proceed to Form 5, "Riverine/Coastal Mapping Form".

4. MODEL PARAMETERS (from model used to revise 100-year water surface elevation)

1. Discharges:	Upstream Limit	Downstream Limit
10-year	_____	_____
50-year	_____	_____
100-year	871	7209
500-year	_____	_____

Attach diagram showing changes in 100-year discharge

2. Explain how the starting water surface elevations were determined For BFE's, the starting WSE is based on maximum stage in the Buckeye Flood Control Structure. For Floodway Modeling, the starting WSE is based on the Slope-Area Method.

3. Give range of friction loss coefficients (Manning's "N") Channel040 to 0.045
 Overbanks050 to .06

Higher Values Used to Code Out Ineffective Flow Areas
 If friction loss coefficients are different anywhere along the revised reach from those used to develop the FIRM, give location, value used in the effective FIS, and revised values and an explanation as to how the revised values were determined. N/A

Location	FIS	Revised
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Explain: _____

4. Describe how the cross section geometry data were determined (e.g., field survey, topographic map, taken from previous study) and list cross sections that were added.

Digitized using Photogrammetric Methods by Aerial Mapping, Inc.

5. Were natural channel banks selected as the location of the left and right channel banks in the model?

Yes No If no, explain why not: _____

4. MODEL PARAMETERS (Cont'd)

6. Explain how reach lengths for channel and overbanks were determined:

Measured from 400 scale work map

5. RESULTS (from model used to revise 100-year water surface elevations)

1. Do the results indicate:

- a. Water surface elevations higher than end points of cross sections? Yes No
- b. Supercritical depth? Yes No
- c. Critical depth? Yes No
- d. Other unique situations Yes No

If yes to any of the above, attach an explanation that discusses the situation and how it is presented on the profiles, tables, and maps.

2. What is the maximum change in energy ^{grade elevation} ~~gradient~~ between cross-sections? 8.65'

Specify location Between Sections 9.52 and 9.61

3. What is the distance between the cross-sections in 2 above? 470'

4. What is the maximum distance between cross-sections? 670'

Specify location Section 8.13

5. Floodway determination

a. What is the maximum surcharge allowed by the community or State? 1.0 foot

b. What is the maximum surcharge for the revised conditions? 0.91 foot

Specify location Several Locations

c. What is the maximum velocity? 9.99 fps

Specify location Section 3.96

d. Are there any negeative surcharge values at any cross-section? Yes No

If yes, the floodway may need to be widened. If it is not widened, please explain and indicate the maximum negative surcharge.

Explain: Maximum negative surcharge is 0.2' at Section 8.5. Changing width at
that section did not eliminate it. Based upon discussions with the
Flood Control District, an attempt was made to use a consistent floodway
width.

5. RESULTS (Cont'd)

6. Is the discharge value used to determine the floodway anywhere different from that used to determine the natural 100-year flood elevations? Yes No

If Yes, explain:

7. Do 100-year water surface elevations increase at any location? *No Previous BFE's* Yes No

If yes, please attach a list of the locations where the increases occur, state whether or not the increases are located on the requestor's property, and provide an explanation of the reason for the increases. (For example: State if the increase is due to fill placed within the floodway fringe or placed within the currently adopted floodway limits)

Please attach a completed comparison table entitled: Water Surface Elevation Check (See page 6)

6. REVISED FIRM/FBFM AND FLOOD PROFILES

A. The revised water surface elevations tie into those computed by the effective FIS Model (10-, 50-, 100-, and 500-year), downstream of the project at cross-section _____ within _____ feet (vertical) and upstream of the project at cross section _____ within _____ feet (vertical).

B. The revised floodway elevations tie into those computed by the effective FIS model, downstream of the project at cross section _____ within _____ feet (vertical) and upstream of the project at cross section _____ within _____ feet (vertical).

C. Attach profiles, at the same vertical and horizontal scale as the profiles in the effective FIS report, showing stream bed and profiles of all floods studied (without encroachment). Also, label all cross sections, road crossings (including low chord and top-of-road data), culverts, tributaries, corporate limits, and study limits. If channel distance has changed, the stationing should be revised for all profile sheets.

D. Attach a Floodway Data Table showing data for each cross section listed in the published Floodway Data Table in the FIS report.

Proceed to Riverine /Coastal Mapping Form

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 2.25 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and reviewing the form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden, to: Information Collections Management, Federal Emergency Management Agency, 500 C Street, S.W., Washington, DC 20472; and to the Office of Management and Budget, Paperwork Reduction Project (3067-0148), Washington, DC 20503.

Community Name: Maricopa County and Town of Buckeye

Flooding Source: White Tanks Wash Tributary #1
(One form for each flooding source)

Project Name/Identifier: White Tanks Wash Flood Insurance Study

1. REACH TO BE REVISED

Downstream limit: White Tanks Wash

Upstream limit: Sun Valley Parkway

2. EFFECTIVE FIS

Not studied

Studied by approximate methods

Downstream limit of study _____

Upstream limit of study _____

Studied by detailed methods

Downstream limit of study _____

Upstream limit of study _____

Floodway delineated

Downstream limit of Floodway _____

Upstream limit of Floodway _____

3. HYDRAULIC ANALYSIS

Why is the hydraulic analysis different from that used to develop the FIRM. *(Check all that apply)*

Not studied in FIS

Improved hydrologic data/analysis. Explain: _____

Improved hydraulic analysis. Explain: _____

Flood control structure. Explain: _____

Other. Explain: _____

3. RIVERINE HYDRAULIC ANALYSIS FORM
Models Submitted

For areas which have detailed flooding:

Full input and output listings along with files on diskette (if available) for each of the models listed below (items 1, 2, 3, 4, and 5) and summary of the source of input parameters used in the models must be provided. The summary must include a complete description of any changes made from model to model (e.g. duplicate effective model to corrected effective model) At a minimum, the Duplicate Effective (item 1) and the Revised or Post-Project Conditions (item 4) models must be submitted. See instructions for directions on when other models may be required.

For areas which do not have detailed flooding:

Only the 100-year flood profile is required. A hydraulic model is not required for areas which do not have detailed flooding; however, BFEs may not be added to the revised FIRM. If a hydraulic model is developed for the area, items 3 and 4 described below must be submitted.

If hydraulic models are not developed, hydraulic analyses for existing or pre-project conditions and revised or post-project conditions must be submitted. All calculations must be submitted for these analyses. (See item 6 below)

1. Duplicate Effective Model

Copies of the hydraulic analysis used in the effective FIS, referred to as the effective models (10-, 50-, 100-, and 500-year multi-profile runs and the floodway run) must be obtained and then reproduced on the requestor's equipment to produce the duplicate effective model. This is required to assure that the effective model input data has been transferred correctly to the requestor's equipment and to assure that the revised data will be integrated into the effective data to provide a continuous FIS model upstream and downstream of the revised reach.

Natural	Floodway
<input type="checkbox"/>	<input type="checkbox"/>
N/A	

2. Corrected Effective Model

The corrected effective model is the model that corrects any errors that occur in the duplicate effective model, adds any additional cross sections to the duplicate effective model, or incorporates more detailed topographic information than that used in the currently effective model. The corrected effective model must not reflect any man-made physical changes since the date of the effective model. An error could be a technical error in the modeling procedures, or any construction in the floodplain that occurred prior to the date of the effective model but was not incorporated into the effective model.

Natural	Floodway
<input type="checkbox"/>	<input type="checkbox"/>
N/A	

3. Existing or Pre-Project Conditions Model

The duplicate effective or corrected model is modified to produce the existing or pre-project conditions model to reflect any modifications that have occurred within the floodplain since the date of the effective model but prior to the construction of the project for which the revision is being requested. If no modification has occurred since the date of the effective model, then this model would be identical to the corrected effective or duplicate effective model.

Natural	Floodway
<input type="checkbox"/>	<input type="checkbox"/>
N/A	

4. Revised or Post-Project Conditions Model

The existing or pre-project conditions model (or duplicate effective or corrected effective model, as appropriate) is revised to reflect revised or post-project conditions. This model must incorporate any physical changes to the floodplain since the effective model was produced as well as the effects of the project. When the request is for proposed project this model should reflect proposed conditions.

Natural	Floodway
<input type="checkbox"/>	<input type="checkbox"/>
N/A	

5. Other: Please attach a sheet describing all other models submitted.

Natural	Floodway
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

6. Hydraulic Analyses (Only if Hydraulic Models are not developed)

Please attach all calculations for the existing or pre-project conditions and the revised or post-project conditions. Proceed to Form 5, "Riverine/Coastal Mapping Form".

4. MODEL PARAMETERS (from model used to revise 100-year water surface elevation)

1. Discharges:	Upstream Limit	Downstream Limit
10-year	_____	_____
50-year	_____	_____
100-year	6.03	816
500-year	_____	_____

Attach diagram showing changes in 100-year discharge

2. Explain how the starting water surface elevations were determined Slope-Area Method

3. Give range of friction loss coefficients (*Manning's "N"*) Channel 0.040 to 0.045
 Overbanks 0.050 to 0.060

Higher Values Used to Code Out Ineffective Flow Areas

If friction loss coefficients are different anywhere along the revised reach from those used to develop the FIRM, give location, value used in the effective FIS, and revised values and an explanation as to how the revised values were determined. N/A

<u>Location</u>	<u>FIS</u>	<u>Revised</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Explain: _____

4. Describe how the cross section geometry data were determined (e.g., field survey, topographic map, taken from previous study) and list cross sections that were added.

Digitized using Photogrammetric Methods by Aerial Mapping, Inc.

5. Were natural channel banks selected as the location of the left and right channel banks in the model?

Yes No If no, explain why not: _____

4. MODEL PARAMETERS (Cont'd)

6. Explain how reach lengths for channel and overbanks were determined:

Measured from 400 scale aerial photos

5. RESULTS (from model used to revise 100-year water surface elevations)

1. Do the results indicate:

- a. Water surface elevations higher than end points of cross sections? Yes No
- b. Supercritical depth? Yes No
- c. Critical depth? Yes No
- d. Other unique situations Yes No

If yes to any of the above, attach an explanation that discusses the situation and how it is presented on the profiles, tables, and maps.

2. What is the maximum change in energy ^{grade elevation} ~~gradient~~ between cross-sections? 6.05

Specify location Sections 1.89 to 2.01

3. What is the distance between the cross-sections in 2 above? 595

4. What is the maximum distance between cross-sections? 600

Specify location Sections 1.21 to 1.10

5. Floodway determination

a. What is the maximum surcharge allowed by the community or State? 1.0 foot

b. What is the maximum surcharge for the revised conditions? 1.0 foot

Specify location At First Section

c. What is the maximum velocity? 7.73 fps

Specify location Section 3.53

d. Are there any negative surcharge values at any cross-section? Yes No

If yes, the floodway may need to be widened. If it is not widened, please explain and indicate the maximum negative surcharge.

Explain: The maximum negative surcharge is 0.1' at Section 3.05. Based upon
discussions with the Flood Control District, the floodway was smoothed to
obtain a relatively consistent width.

5. RESULTS (Cont'd)

6. Is the discharge value used to determine the floodway anywhere different from that used to determine the natural 100-year flood elevations? Yes No

If Yes, explain:

7. Do 100-year water surface elevations increase at any location? No Previous BFE's Yes No

If yes, please attach a list of the locations where the increases occur, state whether or not the increases are located on the requestor's property, and provide an explanation of the reason for the increases. (For example: State if the increase is due to fill placed within the floodway fringe or placed within the currently adopted floodway limits)

Please attach a completed comparison table entitled: Water Surface Elevation Check (See page 6)

6. REVISED FIRM/FBFM AND FLOOD PROFILES

A. The revised water surface elevations tie into those computed by the effective FIS Model (10-, 50-, 100-, and 500-year), downstream of the project at cross-section _____ within _____ feet (vertical) and upstream of the project at cross section _____ within _____ feet (vertical).

B. The revised floodway elevations tie into those computed by the effective FIS model, downstream of the project at cross section _____ within _____ feet (vertical) and upstream of the project at cross section _____ within _____ feet (vertical).

C. Attach profiles, at the same vertical and horizontal scale as the profiles in the effective FIS report, showing stream bed and profiles of all floods studied (without encroachment). Also, label all cross sections, road crossings (including low chord and top-of-road data), culverts, tributaries, corporate limits, and study limits. If channel distance has changed, the stationing should be revised for all profile sheets.

D. Attach a Floodway Data Table showing data for each cross section listed in the published Floodway Data Table in the FIS report.

Proceed to Riverine /Coastal Mapping Form

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 1.5 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and reviewing the form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden, to: Information Collections Management, Federal Emergency Management Agency, 500 C Street, S.W., Washington, DC 20472; and to the Office of Management and Budget, Paperwork Reduction Project (3067-0148), Washington, DC 20503.

Community Name: Maricopa County and Town of Buckeye

Flooding Source: White Tanks Wash and Tributaries

Project Name/Identifier: White Tanks Wash Flood Insurance Study

1. MAPPING CHANGES

1. A topographic work map of suitable scale, contour interval, and planimetric definition must be submitted showing (indicate N/A when not applicable):

- | | Included |
|--|--|
| A. Revised approximate 100-year floodplain boundaries (Zone A) | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A |
| B. Revised detailed 100- and 500-year floodplain boundaries | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A |
| C. Revised 100-year floodway boundaries | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A |
| D. Location and alignment of all cross sections used in the revised hydraulic model with stationing control indicated | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A |
| E. Stream alignments, road and dam alignments | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A |
| F. Current community boundaries | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A |
| G. Effective 100- and 500-year floodplain and 100-year floodway boundaries from the FIRM/FBFM reduced or enlarged to the scale of the topographic work map | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A |
| H. <u>Tie-ins</u> between the <u>effective</u> and <u>revised</u> 100- and 500-year floodplains and 100-year floodway boundaries | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A |
| I. The requestor's property boundaries and community easements | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A |
| J. The signed certification of a registered professional engineer | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A |
| K. Location and description of reference marks | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A |
| L. Vertical datum (example: NGVD, NAVD etc.) | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A |
| M. Coastal zone designations tie into adjacent areas not being revised | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A |
| N. Location and alignment of all coastal transects used to revise the coastal analyses | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A |

If any of the items above are marked no or N/A, please explain: The requestor is the Flood Control District of Maricopa County.

2. What is the source and date of the updated topographic information (example: orthophoto maps, July 1985; field survey, May 1979, beach profiles, June 1987, etc.)? October 1991

3. What is the scale and contour interval of the following workmaps?
 a. Effective FIS 1" = 2000' scale Unknown Contour interval
 b. Revision Request 1" = 400' scale 4' Contour interval

NOTE: Revised topographic information must be of equal or greater detail.

4. Attach an annotated FIRM and FBFM at the scale of the effective FIRM and FBFM showing the revised 100-year and 500-year floodplains and the 100-year floodway boundaries and how they tie into those shown on the effective FIRM and FBFM downstream and upstream of the revision or adjacent to the area of revision for coastal studies. Attach additional pages if needed.

1. MAPPING CHANGES (Cont'd)

5. Flood Boundaries and 100-year water surface elevations:

Has the 100-year floodplain been shifted or increased or the 100-year water surface elevation increased at any location on property other than the requestor's or community's? Yes No

If yes, please give the location of shift or increase and an explanation for the increase.

The majority of the area was previously unstudied. The approximate Zone A boundary at the Buckeye Flood Control Structure is also adjusted.

a. Have the affected property owners been notified of this shift or increase and the effect it will have on their property? ..Notified of Pending Study..... Yes No

If yes, please attach letters from these property owners stating they have no objections to the revised flood boundaries if a LOMR is being requested. (See Book A)

b. What is the number of insurable structures that will be impacted by this shift or increase? Unknown

6. Have the floodway boundaries shifted or increased at any location compared to those shown on the effective FBFM or FIRM? Yes No

If yes, explain:

New floodway boundaries for previously unstudied watercourse.

7. If a V- zone has been designated, has it been delineated to extend landward to the heel of the primary frontal dune? Yes No

If no, explain:

8. Manual or digital map submission:

Manual

Digital

Digital map submissions may be used to update digital FIRM's (DFIRM's). For updating DFIRM's, these submissions must be coordinated with FEMA Headquarters as far in advance of submission as possible.

2. EARTH FILL PLACEMENT

1. The fill is: Existing Proposed
2. Has fill been/will be placed in the regulatory floodway? Yes No
If yes, please attach completed Riverine Hydraulic Analysis Form.
3. Has fill been/will be placed in floodway fringe (area between the floodway and 100-year floodplain boundaries)? Yes No

If yes, then complete A, B, C, and D below.

- A. Are fill slopes for granular materials steeper than one vertical on one-and-one-half horizontal? Yes No

If yes, justify steeper slopes _____

- B. Is adequate erosion protection provided for fill slopes exposed to moving flood waters? (Slopes exposed to flows with velocities of up to 5 feet per second (fps) during the 100-year flood must, at a minimum, be protected by a cover of grass, vines, weeds, or similar vegetation; slopes exposed to flows with velocities greater than 5 fps during the 100-year flood must, at a minimum, be protected by stone or rock riprap.)
..... Yes No

If no, describe erosion protection provided _____

- C. Has all fill placed in revised 100-year floodplain been compacted to 95 percent of the maximum density obtainable with the Standard Proctor Test Method or acceptable equivalent method? Yes No
- D. Can structures conceivably be constructed on the fill at any time in the future? Yes No

If yes, provide certification of fill compaction (item C. above) by the community's NFIP permit official, a registered professional engineer, or an accredited soils engineer.

4. Has fill been/will be placed in a V-zone? Yes No
- If yes, is the fill protected from erosion by a flood control structure such as a revetment or seawall? Yes No

If yes, attach the coastal structures form.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WHITE TANKS WASH FLOOD INSURANCE STUDY

FCD 90-64

HYDROLOGIC ANALYSIS

BOOK A



Peter H. Hemingway

PREPARED BY:

Harding Lawson Associates, Inc.
Alpha Engineering Group
2800 North 44th Street, Suite 500
Phoenix, ARIZONA 85013
602/954-0436



January 30, 1996

TABLE OF CONTENTS

	<u>Book & Page</u>
Cover Letter	A
FEMA Review Forms	A
I INTRODUCTION	
a. Purpose of Study	A-1
b. Authority for Study	A-1
c. Coordination and Acknowledgements	A-1
II AREA STUDIED	
a. Scope of Study	A-3
b. Community Description	A-3
c. Principal Flood Problems	A-4
d. Flood Protection	A-4
III ENGINEERING METHODS	
a. Hydrologic Analyses	A-5
b. Hydraulic Analyses	A-6
IV FLOODPLAIN MANAGEMENT APPLICATIONS	
a. Flood Boundaries	A-8
b. Floodways	A-8
V. INSURANCE APPLICATION	A-10
VI OTHER STUDIES	A-11
VII LOCATION OF DATA	A-12
VIII BIBLIOGRAPHY	A-13
IX STUDY DOCUMENTATION	
Section 1: General Documentation and Correspondence	A-DOC
1.1 Special Problem Reports (none)	
1.2 Contact (Telephone) Reports (included in 1.4)	
1.3 Meeting Minutes or Reports	
1.4 General Correspondence	
1.5 Contract Documents (Scope of Work)	

Section 2: Mapping and Survey Information	A
2.1 Description of mapping, map control and any other survey information.	
2.2 Elevation reference marks	
2.3 GPS daily reports	
2.4 Horizontal control	
2.5 Coordinate field ties	
2.6 State plane coordinates	
2.7 Vertical level notes	
2.8 Benchmark data	
2.9 Aerial adjustments	
2.10 Final coordinates	
2.11 Culvert data	
2.12 Cross section check	
2.13 Sun Valley Parkway data	
2.14 Miscellaneous maps	
Flow Paths	
Basins and USGS Quads	
Basins, Soils and Topo	
Basins and Soils	
Section 3: Hydrologic Analysis	
3.1 Method description	B-2
3.2 Parameter estimation	B-3
3.2.1 Drainage area boundaries	B-2
3.2.2 Physical parameters	B-7
3.2.3 Statistical parameters	B-11
3.2.4 Precipitation	B-12
3.2.5 Gage data	B-14
3.3 Calibration	B-15
3.4 Special problems/solutions	B-16
3.5 Final results/computer runs	B-20
Section 4: Hydraulic Analysis	
4.1 Method Description	C-1
4.2 Parameter Estimation	C-1
4.2.1 Cross Section Data and Descriptions	C-1
4.2.2 Manning's N-values	C-2
4.2.3 Expansion and contraction coefficients	C-2
4.2.4 Peak Discharge Values	C-2
4.2.5 Ineffective Flow Areas	C-2
4.2.6 Floodway Analyses	C-4

Book & Page

4.3	White Tanks Wash	C-5
4.4	White Tanks Wash Tributary #1	
4.5	White Tanks Wash Tributaries #2 and #3	
4.6	Photographs	
4.7	Results	

Appendix A - White Tanks Wash - Photographs of Stream Sections	C
Appendix B - White Tanks Wash - HEC-2 Output - Water Surface Profile	C
Appendix C - White Tanks Wash - HEC-2 Output - Floodway Method 4	C
Appendix D - White Tanks Wash - HEC-2 Output - Floodway Method 1	C
Appendix E - White Tanks Wash - Plotted Cross Sections	C
Appendix F - White Tanks Wash Tributary #1 - Photographs of Stream Sections	C
Appendix G - White Tanks Wash Tributary #1 - HEC-2 Output - Water Surface Profile	C
Appendix H - White Tanks Wash Tributary #1 - HEC-2 Output - Floodway Method 4	C
Appendix I - White Tanks Wash Tributary #1 - HEC-2 Output - Floodway Method 1	C
Appendix J - White Tanks Wash Tributary #1 - Plotted Cross Sections	C
Appendix K - White Tanks Wash Tributary #2 Approximate Analysis	C
Appendix L - White Tanks Wash Tributary #2b Approximate Analysis	C
Appendix M - White Tanks Wash Tributary #3 Approximate Analysis	C
Diskette Containing Hydrology Files	C
Diskette Containing Hydraulics Files	C

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
WHITE TANKS WASH
FLOOD INSURANCE STUDY

I. INTRODUCTION

a. Purpose of Study

The purpose of this Flood Insurance Study is to investigate the extent of flooding along the White Tanks Wash and one tributary from the United States Soil Conservation Service's (USSCS) Buckeye Structure Number One to the Sun Valley Parkway and prepare a Federal Emergency Management Agency (FEMA) Flood Insurance Study (FIS) report based on that information. The study area is in a portion of the unincorporated area of Maricopa County, Arizona.

b. Authority for Study

The sources of authority for this Flood Insurance Study are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

This project was authorized by Contract FCD 90-64 by the Flood Control District of Maricopa County, Arizona (FCDMC) issued to *ALPHA Engineering Group, Inc.* on September 25, 1991.

c. Coordination and Acknowledgements

The Flood Control District of Maricopa County assisted in the selection of the stream tributary to be studied and included in the study. They also provided a copy of their Drainage Design Manual for Maricopa County, two, six and 24 hour rainfall distributions, a copy of Geologic Mapping of Flood Hazards in Maricopa County, Buckeye FRS Hydrology Study, S-Graph Study, Estimated Manning's Roughness Coefficients for Stream Channels and Flood Plains In Maricopa County, Arizona, four computer programs (MCUHP1, MCUHP2, Prefree and Rational) and guidance and sample formats for the report.

Soil Surveys of Maricopa County, Arizona, Central Part and Aguila-Carefree Area, Parts of Maricopa and Pinal Counties, Arizona were obtained from the US Soil Conservation Service. File records for the Buckeye Structures were graciously made available by Tom Daya and others at SCS for determining the beginning water surface condition.

The Maricopa County Department of Transportation provided access to copies of reports on the Sun Valley Parkway as did Collar, Williams and White Engineering Company for use in determining the design data on the culvert crossings of the Parkway.

This study was coordinated with and reviewed by the Water Resources Department of the State of Arizona.

Valuable insight concerning the problems of sediment transport and deposition, cross-over flows and the control provided by the Parkway and its culverts was provided by Emmett M. Laursen, Professor Emeritus at the University of Arizona. The professor is a renowned expert in sediment transport particularly in the Southwestern United States and served as consultant to Alpha during the study.

Subconsultants on the study were McEwen Global Positioning Systems, Inc. for the horizontal control, Brooks, Hersey and Associates, Inc. who provided the vertical control and panelling, Aerial Mapping Company, Inc. who performed the aerial photography and mapping and GIS Consultants of Arizona, Ltd who digitized the graphic data and converted it into the County Geographic Information System (GIS).

II. AREA STUDIED

a. Scope of Study

The area selected for study under this contract were based upon expected future development and severity and predictability of flooding. The study was limited to areas of the watershed that were riverain in nature as opposed to those that might be considered active alluvial fan areas. The division between these areas was clearly delineated by the Sun Valley Parkway with the streams to the west of the Parkway excised into the terrain and exhibiting only slow migration caused by bank erosion and meandering. The study area is outlined on the Vicinity Map (Fig. 1) on page 4.

b. Community Description

Maricopa County is located in south-central Arizona and encompasses an area of 9,238 square miles. A large portion of the County remains either undeveloped or rural in nature although the 1990 population was 2,122,000 and growing at about three percent per year. This rapidly increasing population represents a constant pressure to develop new areas every year for residential, commercial and industrial growth. The study area is very lightly populated at present. With the exception of less than 10 developed homesites scattered in the eastern basin, all of the development is in the very southwestern corner of the area. Even there, only about 30 of the subdivided lots have been developed.

The terrain in the County varies from steep, rugged mountains to flat stream and river valleys. The entire area is desert but with widely varied vegetation, terrain and rainfall. Small intermittent streams and washes flow from the mountains and elevated terrain towards the major river valleys which include the Salt, Gila, New, Agua Fria and Hassayampa Rivers. Many of these streams now are at least partially controlled by irrigation, recreational and flood control projects.

The Hassayampa River borders the study area on the west and flows southerly to join the Gila River about eight miles west of Buckeye. The river drains areas of northwestern Maricopa County and south-central Yavapai County. It originates in the heavily forest covered Bradshaw Mountains near Prescott, across rolling hills in the middle third of its course and for the final third flows through a gently rolling desert valley. The river, like most desert rivers, is susceptible to flash floods primarily following summer thunderstorms that flow from the steep (400 ft/mi) upper reaches to the relatively flat lower reaches (20 ft/mi).

The study area is dominated by the rugged White Tank Mountains on the eastern edge which rise in elevation to 4083 feet. The mountain area is cut with well defined stream valleys that pour out onto the alluvial valleys at the base of the mountains. These valleys are concentrated by the culverts under the Sun Valley Parkway into well defined stream channels that are currently incising themselves into the beds that existed prior to the Parkway construction. The County is within the Sonoran Desert with long, hot summers reaching 120° Fahrenheit. Winters vary from short and mild in the south to surprisingly cold in the upper elevations of the northern mountains.

c. Principal Flood Problems

Flooding in the project area is essentially limited to runoff from the drainage basin. Only small areas on the extreme western edge of the basin area lie within the flood plain of the Hassayampa River and none of those are within the flood plain study area. Although flooding may occur at any time of the year in the study area, the high rainfall intensity of summer thunderstorms, the lack of significant snow pack and the high infiltration rate of much of the soil in the stream valleys, limits the major floods to the summer "monsoon" season following a very intense storm. Observation of the area during the winter of 1992/93 has indicated that even during heavy daily rainfall (1 to 3") the runoff in the streams remains low and well within the channels of even minor streams. The major flood runoff that originates from thunderstorms in the mountains and carries substantial quantities of sediment has deposited almost all of it by the time it emerges from the culverts into the study area. These major flood flows will occasionally fill the low flow channels which are bordered by heavy desert brush and overflow into the broader high flow channels which typically are covered by sparse desert shrubs and grasses. The defined low flow channels and widely spaced floods leads unsuspecting homeowners into acting on their belief that flooding is limited to these low flow channels.

d. Flood Protection

The only flood protection facility that affects the study area is the USSCS Buckeye Structures 1, 2 and 3 which divert the runoff north of Interstate 10 from the White Tank Mountains to the west and into the Hassayampa River. These dikes were built to protect the farm areas surrounding Buckeye and will detain a 100 year design storm before overtopping the spillway. The Sun Valley Parkway might be considered a partial flood control structure since it diverts any flows above the capacity of the culverts to the south along the east side of the Parkway and into the Buckeye Structure.

III. ENGINEERING METHODS

Standard hydrologic and hydraulic study methods were used in this study to determine the flood hazard information in this study. The 100 year recurrence interval was selected by the FCDMC as the basis for determining the flooding potential within the study area. The 100 year recurrence interval is the average time interval in years between floods of a given or greater magnitude. It can also be defined as the size of flood that has a one percent chance of being equaled or exceeded during any year. Although the recurrence interval statistically represents the average time between floods of a given magnitude, in reality, 100 year floods may occur very close together. This is particularly true of hydrologic events since the controlling factors appear to be cyclic in nature and produce wet and dry cycles. Risk analysis also should be considered in that the chance of a 100 year flood occurring in any 50 year period is approximately 40 percent. The study analysis reflects the mathematical projection of flooding potential based on existing conditions in the study area.

a. Hydrologic Analyses

The hydrology for the study basin was developed using the U.S. Army, Corps of Engineers, Hydraulic Engineering Center's HEC-1 computer program, version 4.0 updated to September 1990. The program used was HEC-1, Version 6.1 as implemented for the PC in Fortran by Haestad Methods. Two different storms were used for analyzing precipitation. A 100-year 6-hour storm using the FCD's distributions with the Corps of Engineers' Queen Creek areal reduction and a 100-year 24-hour storm using SCS Type II Distribution and NOAA HYDRO-40 areal reduction. Losses were calculated using the Green-Ampt method based on SCS soil types. The S-Graph Phoenix Mountain or Valley unit hydrograph was used with the division between types at the western toe of the White Tank Mountains.

The subbasins for this study were carefully selected to have as boundaries, watershed divides that are not subject to split flows for at least one 100-year storm. In addition, basin boundaries are continuous from the mountains to outlet. This results in some subbasins that are larger than optimum and with parallel streams rather than a single stream. The resulting basins will remain stable entities unless changed by man or a low probability major flood event. This approach also removes the need for judgement in dividing split flows between subbasins.

In the study channels, transmission losses are a significant factor in small (under 10-year) floods, because the channel normally has not received enough rainfall to saturate it prior to arrival of the peak. For large floods, such as the 100-year event, the channel will be essentially saturated when the peak arrives. If the initial and uniform infiltration rates have been properly determined and applied for the subbasin, transmission losses from infiltration will have only a very minor effect on the peak flow rate.

b. Hydraulic analysis

Water surface profiles for the 100-year flood in the study area were determined using standard backwater curve methods as programmed in the USCE HEC-2 computer program, version 4.6.2 of September 1990, updated to August 1991 and implemented by Boss Corporation's version 3.10. Preliminary runs were checked and verified with Haestad Methods implementation of the same version.

Cross sections for the study area were digitized directly from the 1:16,300 scale aerial photography that was used for the four foot contours of the same area. Locations of the cross sections are shown in the flood profiles (Section 2.6 Book A - Maps) and on the Flood Boundary/Floodway Map. Manning's "n" values, which ranged from 0.035 to 0.061 were determined during field reconnaissance trips on November 11, 12, 16 and 17, 1992. Consistency with other studies was obtained through use of a field trip for "n" value coordination with Russ Cruff, Tim Murphy and Sandy Storey of the FCDMC on June 26, 1991 and by use of the U.S. Geological Survey manual on "Estimating Manning's Roughness Coefficients for Stream Channels and Flood Plains in Maricopa County, Arizona" (Reference 63).

The starting water surface at the SCS Buckeye Structure No. 1 was determined assuming that the storage area was full to the spillway crest elevation of 1179.8. A 100-year event is required to fill the structures to this level with the outfall pipe plugged, so it provides a conservative backwater curve for the lower reaches of White Tanks Wash. The 800' length of the emergency spillway provides assurance that backwater elevations will not be significantly higher in any 100-year flood in the wash. Lower starting elevations probably will prevail in the field when the wash peaks because of the 16 hours required for flow from Structures 1A, 2 and 3 to reach and fill Structure 1 to its peak. However, White Tanks Wash will still be flowing on the trailing edge of its hydrograph when the pool is full. Water surface elevations near the pool, therefore will be close to those at peak flow because of the back water effect. Dames & Moore calculated that the maximum water surface for a 100 year storm with a peak flow of 21,297 cfs would be 1180.3 feet with the 60 inch outfall pipe plugged.

The study was limited to the use of the simplified conservation of energy concepts of steady, gradually varied, one-dimensional, rigid boundary flow with constant fluid properties for the hydraulic analysis as implemented in the HEC-2 program. The culverts under the Sun Valley Parkway are considered to be unobstructed. These culverts control the incoming flow to the hydraulic study area. When a culvert reaches its maximum capacity, the excess flow will divert south in the eastern roadside ditch to the next culvert. During floods, water will pond upstream of each of the culverts and the majority of the bed load will settle out near the upper edge of the back-water. The Town of Buckeye has assumed the maintenance of these culverts which will protect the Parkway from overtopping. They will remove the sediment when it starts to obstruct stream flow and maintain control elevations in the roadside ditch on the southeast side of each culvert. The loss of the majority of the sediment load upstream of the study area will result in some incising of the existing channels or an increase in side cutting in a few areas with very hard bed material. The result will be a small lowering of the maximum flood elevations in the area immediately to the west of the Parkway. This effect will diminish as the stream regains bed load from local erosion of the channels. The flood elevations determined in this study are accurate to 0.5 feet based on current field conditions. The elevation datum is the National Geodetic Vertical Datum of 1929. All elevations were set with second order accuracies based on five benchmarks on USCGS first order level line 101. Horizontal control was set by Geodetic Positioning System (GPS) methods from five first and second order USCGS horizontal control points. Control was determined by block adjustment and converted to Arizona State Plane Coordinates, Central Zone, on the North American 1927 Datum. Locations of the Elevation Reference Marks used in this study are described in the Elevation Reference Marks Table (page 4, Section 2.1) and shown on the Watershed Map (Section 2.4).

IV. FLOODPLAIN MANAGEMENT APPLICATIONS

This study has been performed to meet the standards of the National Flood Insurance Program (NFIP) as defined in Reference 26.

The NFIP encourages state and local governments to adopt sound floodplain management programs. The flood boundary map produced by this study is designed to assist Maricopa County and the Town of Buckeye communities in developing sound floodplain management measures.

a. Flood Boundaries

To provide a national standard without regional discrimination, the 100-year flood has been established by FEMA as the base flood for purposes of floodplain management measures. The boundary of the 100-year flood has been delineated using the flood elevation determined at each cross section. Between cross sections the boundary was interpolated using the topographic maps at a scale of 1:4800 with a contour interval of four feet.

The 100-year floodplain boundary is shown on the Flood Boundary and Floodway Map (Section 2.6). Small areas within the flood boundaries may lie above the flood elevations, and therefore, may not be subject to flooding. Small valleys outside of the Flood Boundary may also flood. Due to limitations of the map scale and lack of detailed topographic data, such areas are not shown.

b. Floodways

Encroachment on floodplains, such as structures or fill, reduces the flood carrying capacity, increases flood heights and velocities of streams, and increases flood hazards in areas beyond the encroachment itself. One aspect of floodplain management involves balancing the economic gain from floodplain development against the resulting increase in flood hazard. For the purposes of the NFIP, the concept of a floodway is used as a tool to assist local communities in this aspect of floodplain management. Under this concept, the area of a 100-year flood is divided into a floodway and a floodway fringe. The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 100-year flood can be carried without substantial increase in flood heights. Minimum FEMA standards limit such increases in flood heights to 1.0 feet, provided that hazardous velocities are not produced. Typical relationships between the floodway and the floodway fringe and their significance to floodplain development are shown in Figure 2 below.

The floodway presented in this study was computed on the basis of equal conveyance reduction on each side of the floodplain and adjusted for high velocities and physical discontinuities. The results are tabulated at selected cross sections for each stream segment for which a floodway was computed.

As shown on the Flood Boundary and Floodway Map (Section 2.6), the floodway widths were determined at cross sections. Between cross sections, the boundaries were interpolated. In cases where the boundaries of the floodway and the 100-year floodplain boundaries are either close together or collinear, only the floodway boundary is shown.

The area between the floodway and the boundary of the 100-year flood is defined as the floodway fringe. The floodway fringe encompasses the portion of the floodplain that could be completely obstructed without increasing the water-surface elevation of the 100-year flood by more than 1.0 feet at any point.

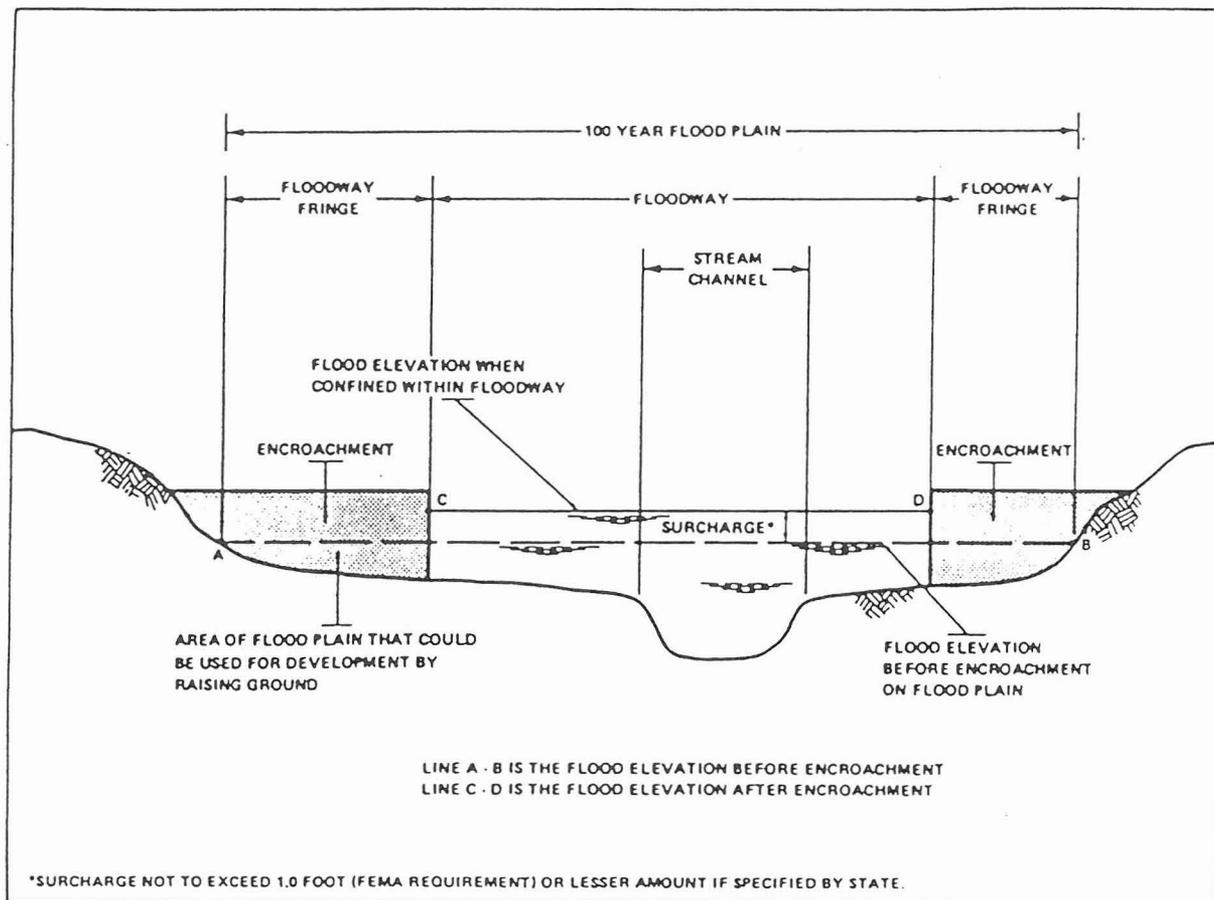


FIGURE 2

V. INSURANCE APPLICATION

For flood insurance rating purposes, flood insurance zone designations are assigned to a community based on the results of the engineering analyses. These zones are as follows:

- Zone A:** Zone A is the flood insurance rate zone that corresponds to 100-year floodplains that are determined in the Flood Insurance Study by approximate methods. No base flood elevations or depths are shown within the zone.
- Zone AE:** Zone AE is the flood insurance rate zone that corresponds to 100-year floodplains that are determined in the Flood Insurance Study by detailed methods. In most instances, whole-foot base flood elevations derived from detailed hydraulic analyses are shown within the zone.
- Zone AH:** Zone AH is the flood insurance rate zone that corresponds to the areas of 100-year shallow flooding (usually areas of ponding) where average depths are between 1 and 3 feet. Whole-foot base flood elevations derived from detailed hydraulic analyses are shown at selected intervals within the zone.
- Zone X:** Zone X is the flood insurance rate zone that corresponds to areas outside 500-year floodplain, areas within the 500-year floodplain, areas of 100-year flooding where average depths are less than 1 foot, areas of 100-year flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 100-year flood by levees. No base flood elevations or depths are shown within the zone.

VI. OTHER STUDIES

A Flood Insurance Study for Maricopa County, Arizona and Incorporated Areas was performed by the Federal Emergency Management Agency that covered the Hassayampa River and other large streams in the County (Reference 25)

The US Soil Conservation Service performed design and hydrologic studies for the Buckeye Structures prior to construction. (Unpublished). The calculations and as built drawings are on file in SCS depository storage. Stage/storage and discharge curves and spillway as-built data was hand copied for use in this study. Drainage studies were performed by Collar, Williams and White for the Sun Valley Parkway design. (References 15, 16, 17, 18, and 19).

The Buckeye Flood Retarding Structure study by Dames and Moore for the Flood Control District of Maricopa County was performed as a check on the design and sedimentation effects for the Buckeye Structures. This study covered the same area as this study, but with much less detail and for a different purpose. Peak flows were comparable.(Reference 22 & 23)

A study was performed and a report prepared on the Geologic Mapping of Flood Hazards in Maricopa County (Reference 67) which used the development and disturbance of desert varnish on exposed rocks to determine the areas that had been disturbed by water in recent geological periods. The results of this study compared closely with the floodways determined herein.

VII. LOCATION OF DATA

Information concerning the survey, hydrologic, hydraulic and other pertinent data used in this study may be obtained from the Flood Control District of Maricopa County, 2801 West Durango Street, Phoenix, Arizona 85009.

VIII BIBLIOGRAPHY

1. Aerial Mapping Company, Inc., White Tanks Area Photos, Scale 1:24,000, October 3, 1991 and Scale 1:16,300, October 25, 1991.
2. Aerial Mapping Company, Inc., White Tanks Topographic Maps, Scale 1:4800, Contour Interval 4 feet, 1991.
3. American Society of Civil Engineers, M & R 43, Nomenclature for Hydraulics, 1962.
4. American Iron and Steel Institute (AISI), Modern Sewer Design, Washington, D.C., 1980.
5. Arizona Department of Transportation, Hydrologic Design for Highway Drainage in Arizona, March 1969.
6. Arizona Department of Transportation, Hydrologic Design for Highway Drainage in Arizona, revised 1979.
7. Arizona Department of Transportation, Hydrologic Design for Highway Drainage in Arizona, December 1968.
8. Arizona Department of Water Resources, Engineering Division, Flood Management Section, Instructions for Organizing and Submitting Technical Documentation for Flood Study, August 1990, revised September 1991.
9. Arizona Geological Survey, Field and Pearthree, Geologic Mapping of Flood Hazards in Maricopa County - White Tank Mountains Flood Hazard Maps, 1991.
10. Boss Corporation, Boss HEC-2 Computer Program for PCs and User's Manual, May 1992.
11. Brater, Ernest F. and Horace Williams King, Handbook of Hydraulics, McGraw-Hill, Inc., New York, 1976.
12. Brazel, Clark, Reich, Storm Rainfall Probability Atlas for Arizona, October 1988.
13. Chow, Ven Te, Open-Channel Hydraulics, New York: McGraw-Hill Book Company, 1959.
14. Chow, Ven Te, Handbook of Applied Hydrology, 1964.
15. Chow, Ven Te, Hydrologic Determination of Waterway Areas for the Design of Drainage Structures in Small Drainage Basins, 1962.

16. Collar, Williams and White Engineering, Inc., Hydrologic/Hydraulic Design Analysis of Proposed Sun Valley Parkway Crossing of the Buckeye Watershed Structure, April 1987, revised August 1987.
17. Collar, Williams and White Engineering, Inc., Drainage Enhancements for Sun Valley Parkway, October 1988.
18. Collar, Williams and White Engineering, Inc., Drainage Report Sun Valley Parkway Phase II, March 1987, revised April 1987.
19. Collar, Williams and White Engineering, Inc., Drainage Report Sun Valley Parkway Phase III, January 1987, revised April 1987.
20. Collar, Williams and White Engineering, Inc., Drainage Design Report for Sun Valley Parkway Drainage Enhancement, November 1988.
21. Creager, Justin and Hinds, Engineering for Dams, 1945.
22. Dames and Moore, Dam-Break Analysis, Buckeye Floodwater Retarding Structures #1, #2 and #3 for Flood Control District of Maricopa County, January 1990.
23. Dames and Moore, Hydrologic Analysis, Buckeye Floodwater Retarding Structures #1, #2 and #3 for Flood Control District of Maricopa County, January 1990.
24. Davis, Calvin Victor and Kenneth E. Sorensen, Editors, Handbook of Applied Hydraulics, McGraw-Hill, Inc., New York, 1969.
25. Federal Emergency Management Agency, Flood Insurance Study, Maricopa County, Arizona and Incorporated Areas, Volumes 1 through 3, May 1990.
26. Federal Emergency Management Agency, Flood Insurance Study Guidelines and Specifications for Study Contractors, FEMA 37, July 1992.
27. Flood Control District of Maricopa County, Memo from Nicholas Karran, Sun Valley Parkway - Review of Damage from August 20, 1988 Flood, September 8, 1988.
28. Flood Control District of Maricopa County, Uniform Drainage Policies and Standards for Maricopa County, Arizona, February 1987.
29. Flood Control District of Maricopa County, Hydrologic Design Manual for Maricopa County, June 1992.

30. Flood Control District of Maricopa County, Watershed Work Plan, Buckeye Watershed, Maricopa County, Arizona, October 1963.
31. Flood Control District of Maricopa County, S-Graph Study, November 1987.
32. Flood Control District of Maricopa County, Drainage Design Manual for Maricopa County, Arizona, November 1991.
33. Greiner Engineering Sciences, Inc., Sun Valley Parkway Design Criteria, February 1987.
34. Haestad Methods Inc., Full Microcomputer Implementation of HEC-1, version 6.1, May 1991.
35. Haestad Methods Inc., Full Microcomputer Implementation of HEC-2, version 6.4, August, 1991.
36. Hiemstra and Reich, Engineering Judgment and Small Area Flood Peaks, April 1967.
37. Hoggan, Daniel H., Computer-Assisted Floodplain Hydrology & Hydraulics, 1989.
38. Leeds, Hill and Jewett, Watershed Models and the Flood Hydrograph Package (HEC-1), A Review of Theory and Applications, July 1974.
39. Linsley, Kohler, Paulhus, Applied Hydrology, 1949.
40. Malvick, Allan J., A Magnitude-Frequency-Area Relation for Floods in Arizona, January 1980.
41. Reich, B.M., Design Hydrographs for Very Small Watersheds from Rainfall, July 1962.
42. Reich, Brian M., Flood Frequency Methods for Arizona Streams, October 1988.
43. Simons, Li & Associates, Engineering Analysis of Fluvial Systems, 1982.
44. U.S. Army, Corps of Engineers, Hydrologic Engineering Center, Accuracy of Computer Water Surface Profiles, December 1986.
45. U.S. Army, Corps of Engineers, Hydrologic Engineering Center, Application of the HEC-2 Split Flow Option, April 1982.
46. U.S. Army, Corps of Engineers, Hydrologic Engineering Center, Computing Water Surface Profiles with HEC-2 on a Personal Computer, January 1987.

47. U.S. Army, Corps of Engineers, Hydrologic Engineering Center, Floodway Determination Using Computer Program HEC-2, January 1988.
48. U.S. Army, Corps of Engineers, Hydrologic Engineering Center, HEC-1 Flood Hydrograph Package, Davis, California, version 4.0, September 1990.
49. U.S. Army, Corps of Engineers, Hydrologic Engineering Center, HEC-1 Flood Hydrograph Package Users' Manual, September 1990.
50. U.S. Army, Corps of Engineers, Hydrologic Engineering Center, HEC-2 Water Surface Profiles, Version 4.6.0, September 1991, revised February 1991.
51. U.S. Army, Corps of Engineers, Hydrologic Engineering Center, Hydrologic Analysis of Ungaged Watersheds Using HEC-1, April 1982.
52. U.S. Army, Corps of Engineers, Hydrologic Engineering Center, HEC-2 Water Surface Profiles Users' Manual, January 1981.
53. U.S. Army, Corps of Engineers, Hydrologic Engineering Center, Infiltration and Soil Moisture Redistribution in HEC-1, January 1984.
54. U.S. Army, Corps of Engineers, Sacramento District, Statistical Methods in Hydrology, Leo R. Beard, January 1962.
55. U.S. Army, Corps of Engineers, Hydrologic Engineering Center, The New HEC-1 Flood Hydrograph Package, May 1981.
56. U.S. Bureau of Public Roads (BPR), Hydraulic Charts for the Selection of Highway Culverts, HEC No. 5, U.S. Department of Commerce, December 1965.
57. U.S. Department of Agriculture, Soil Conservation Service, Technical Release No. 55, Urban Hydrology for Small Watersheds, January 1975.
58. U.S. Department of Agriculture, Soil Conservation Service, Technical Release No. 20, Computer Programs for Project Formulation - Hydrology, May 1982.
59. U.S. Department of Agriculture, Soil Conservation Service, Soil Survey of Maricopa County, Arizona, Central Part, September 1977.
60. U.S. Department of Agriculture, Soil Conservation Service, Soil Survey of Aguila-Carefree Area, Parts of Maricopa County and Pinal Counties, Arizona, April 1986.

61. U.S. Department of Agriculture, Soil Conservation Service, Technical Release No. 55, Urban Hydrology for Small Watersheds, June 1986.
62. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Weather Service, Precipitation-Frequency Atlas of the Western United States, Volume VIII-Arizona, 1973.
63. U.S. Department of the Interior, Geological Survey, Estimating Manning's Roughness Coefficients for Stream Channels and Floodplains in Maricopa County, Arizona, April 1991.
64. U.S. Department of the Interior, Geological Survey, Compilation of Flood Data for Maricopa County, Arizona Through September 1965, June 1967.
65. U.S. Department of the Interior, Geological Survey. Compilation of Flood Data for Maricopa County, Arizona Through 1970.
66. U.S. Department of the Interior, Geological Survey, USGS #91-40-41, Basin Characteristics and Stream Flow Statistics, 1991.
67. U.S. Department of the Interior, Geological Survey, Flood Hazards of Tributary-Flow Areas in Southwestern Arizona, WIR/91-4171, Dec 1991.
68. U.S. Department of the Interior, Geological Survey, Roughness Characteristics of Natural Channels, WSP/849, 1967.
69. U.S. Department of the Interior, Geological Survey, 7.5-Minute Topographic Map Series, Scale 1:24,000: Buckeye NW, Arizona: 1958, Photorevised 1982, Wagner Wash Well, Arizona: Provisional Edition 1988, White Tanks Mountains Southeast, Arizona: Photorevised 1971, Valencia, Arizona: Photorevised 1982.
70. U.S. Department of Transportation, Federal Highway Administration (FHWA), Capacity Charts for the Hydraulic Design of Highway Culverts, Hydraulic Engineering Circular No. 10, March 1978.
71. U.S. Department of Transportation, Federal Highway Administration (FHWA), Hydraulic Design of Highway Culverts, Hydraulic Design Series No. 5, 1985.
72. U.S. Department of Transportation, Hydraulic Design of Highway Culverts, Hydraulic Design Series No. 5, FHWA Report No. 1P-85-15, September 1985.



ALPHA
 Engineering
 Group,
 Inc.

MINUTES OF PROJECT KICKOFF MEETING

PREPARED BY:	Jim Barr, P.E.		
ALPHA PROJECT# PROJECT NAME:	5115-01-01 White Tanks Wash Flood Insurance Study		
MEETING DATE:	September 12, 1991		
LOCATION:	Flood Control District of Maricopa County Offices		
ATTENDEES:	Tim Murphy	FCDMC	Project Manager
	Pedro Calza	FCDMC	Flood Plain Br Manager
	Eric Seldman	FCDMC	GIS Technician
	Sandy Storey	FCDMC	Project Hydrologist
	Marta Dent	FCDMC	GIS Br Supervisor
	Amir Motamedi	FCDMC	Watershed Br Manager
	Pete Hemingway	Alpha	Project Engineer
	Jim Barr	Alpha	Project Manager
	Lari Spire	GIS Cons	Vice President
	Glen McEwen	McEwen GPS	President

Tim reviewed the Contract and Scope of Work with discussion only when there were questions or an item needed to be emphasized.

Tim Murphy and Jim Barr as project managers for the FCDMC and Alpha will be the official technical contacts. Contractual contacts remain as in the contract. Informational technical contacts may be made directly with the person involved. Both project managers would appreciate being informed of the results of all such meetings.

Alpha may obtain data under Task 1 from the County. These include Parkway information, SCS Buckeye Structure information, Buckeye structure dam break calculations, ownership lists for the study area for access, a copy of the report on surface rock age on the ancient outwash slopes of the mountains, a sample of AGK's submittal drawings, and a sample form letter of notification to the residents of the area.

Plastic panels for aerial survey must be removed after the photos are complete. Painted targets may be used on County roads and need not be removed. Easily worn paint is requested.

Informal review of reports prior to official submittal was requested by the FCD.

The field trip at the start of the project will be scheduled by Tim with a attempt to schedule it so that Dave Creighton, ADWR, can be with us. Jim Barr requested that the date not be from Sept 26 to Oct 6.

Winn Hjelmerson of the Tucson office of the USGS is producing a Maricopa County "n" Value Assessment study for the FCD that would be an excellent standard to use for this study in conjunction with Russ Cruiff's field trip taken earlier.

Page 8 of the Scope Task 5.1 will be revised to require use of the 1991 version 4.6 of HEC 2.

The coordination meetings to be held every three weeks will be informal meetings of all of those involved in the current work being performed.



There is a revision of the FCD's Hydrologic Design Manual in progress but even the draft will not be ready in less than about a month. The major change that will affect our work is that the log of the area is to be used in some hydrology calculations instead of the area itself. There is also going to be a minor revision of the GIS Data Specification that will be incorporated into the final contract. A copy of the Specification dated July 19, 1991 was supplied to Alpha. It added the Flood Plain polygon under item I on page 5.

The first field work that Alpha will have done will be when Aerial Mapping flies the recon photos for the entire drainage basin.

Tim requested that 2 original affidavits of the advertisements be supplied to the FCD. A sample was supplied. The ads should run twice in the Republic or Gazette on Wednesday and in the weekly Buckeye Valley News, Mark Sheppard Editor.

Billings should be submitted prior to the Wednesday after the first Tuesday of each month and should include a progress report. The report should be submitted to the project manager for review at least three days prior to this date.

The Community Rating System

A copy of the Department of Water Resources manual "Instructions for Organizing and Submitting Technical Documentation for Flood Studies" dated August 1990 was supplied to Alpha.

Alpha is to add to the final submittal data the area of the floodplain in acres, the area of the floodway in acres and the total reach in miles.

There will be a public meeting at the end of the project.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

DISCLAIMER CLAUSE

"SOILS ANALYSIS SPREADSHEET"

Date: 11-22-91

Re: SOILS ANALYSIS SPREADSHEET FOR FCD 90-64 WHITE TANKS WASH

Dear MR. BARR :

The District is providing you a copy of software for a "soils analysis spreadsheet." This software is solely for your use in completing the above-referenced contract for the District, and it will remain the property of the District and must be returned to the District upon completion of the contract.

The software is not to be reproduced and used for your firm in work for other clients and, should such use take place, the District is not responsible for any damages resulting from unauthorized use.

Your signature on this letter will indicate that you have read and understand the limitations on the use of the software. A duplicate letter is enclosed for your files.

Sincerely,

Tim Murphy
FCDMC

James R. Barr
Contractor

ASSUMPTIONS/CRITERIA USED IN DEVELOPING
XKSAT TABLES FOR THE 1991 UPDATE,
HYDROLOGIC DESIGN MANUAL FOR MARICOPA COUNTY

1. Soil textures determined in the SCS Soil Surveys were used as a basis for calculating XKSAT rather than individual sieve analyses.
2. If a soil texture was described as "gravelly", "very gravelly", "extremely gravelly", etc., it's textural classification was bumped up one level in Table 4.2 to account for higher infiltration rates caused by increased biotic activity below surface gravels, and the decrease in areal pore clogging from falling raindrops. Example: a "gravelly loam" became a "sandy loam". Exception: sandy loams were not bumped to loamy sands unless they were described as "very gravelly" or "extremely gravelly". Also, in the opposite direction, "fine" and "very fine" sandy loams were bumped down to loams, due mostly to their sieve analyses.
3. If a surface soil horizon was less than 3 inches deep, it's XKSAT value was compared to the adjoining horizon, and the slower rate was reported in the table.
4. Minor Soil Textures: If more than one texture is assigned to a soil name in the map unit descriptions, then it's minor soil designation was assigned as that which most closely matched the major soil(s) for the map unit in question. Each minor soil was given equal weight in determining the weighted map unit average XKSAT.
5. Rock Outcrop: Soil percentages within map units were normalized based on the percentage of rock outcrop stated in the Soil Surveys. Rock outcrop listed as a minor was ignored.
6. In the Maricopa Central Part soil survey: In the few cases where a minor soil percentage was not given, 5-15% was assumed depending on percentages assigned to other soils in the series. In the Eastern Maricopa survey, minor soils were ignored since no percentages were given and since their textures generally match those of the major soils.

WATERSHED MANAGEMENT BRANCH SUBBASIN LOSS PARAMETER
SPREADSHEET -- ASSUMPTIONS AND USE

ASSUMPTIONS

- * The minor soils described in the soil survey for a given map unit are evenly represented. Furthermore, all minor soils are present in every area mapped with the given map unit name.
- * The composite map unit hydraulic conductivity is best represented by logarithmic averaging of major and minor soils' XKSATs to determine map unit XKSAT values.
- * Rock outcrops are not included in the calculation of map unit XKSAT values.
- * The percent of rock outcrops stated in the soil surveys for a given map unit is the same in every area mapped as that unit.
- * Log averaging of map unit XKSAT values in a subbasin produces the most realistic value of average subbasin hydraulic conductivity.
- * The influence of vegetation cover on infiltration is significant only for XKSAT and not for DTHETA or PSIF.
- * Actual subbasin land uses can be reasonably represented by the land use categories listed in the spreadsheet and that the impervious areas assigned to these land uses are representative in the subbasin in question. (SEE the accompanying Table and its explanation sheet for the categorization scheme developed for use in this spreadsheet.) Furthermore, the DTHETA condition assigned to these land uses is also representative.
- * XKSAT values are only adjusted for vegetation cover if the average subbasin vegetation cover is greater than ten percent.
- * Impervious areas from rock outcrops and urban sources are not mutually exclusive. That is to say, rock outcrops potentially covered by urban impervious areas are not included in the calculation of subbasin RTIMP.

The user may compensate for some of the above assumptions if more specific data is available or required. This can be accomplished by disabling the cell protection (Alt-D) of the "idiot" mode of data entry to the spreadsheet.

If good aerial photography exists or needs to be examined for the study, the percent of rock outcrops can be estimated and entered into the spreadsheet directly.

Vegetation cover can also be set as an average for the subbasin by filling in the AVERAGE = cell with the desired value.

The user may also edit and classify land uses according to their desire as long as new rows are not inserted and the DTHETA condition does not change from the condition specified for that particular row. Furthermore, impervious areas not specified in the land use section of the spreadsheet may be defined in place of those given. If DTHETA conditions need to be changed, the cell ranges defined in the

PERCENT SUBBASIN DRY =
 NORMAL =
 WET =

section may also be redefined in the cells containing the formulas. To do this global cell protection must be disabled (Alt-D).

USE OF THE SPREADSHEET

****DISCLAIMER****

This spreadsheet program is intended solely to ease the process of subbasin loss parameters. Use of the spreadsheet does not relieve the user from any liability with respect to its accuracy or the application of data generated with the spreadsheet.

NOTE: This spreadsheet was written on LOTUS 123 release 2.3. It is not known what effect the use of different releases will have upon the performance of the spreadsheet.

Before using the spreadsheet it is suggested that the user make a directory in DOS which will receive the subsequent subbasin files which will be created (i.e. md [dir name]).

To use the spreadsheet, load the LOTUS program by:

```
cd 123r23 (enter)
123 (enter)
/File Retrieve (select appropriate spreadsheet i.e.
SGRAPH.WK1 or CLARK.WK1) (enter)
```

The spreadsheet loads itself directly into data input mode which allows the user to move only through those cells which appear in blue. To move through these cells use of the right arrow key is recommended.

Enter into cells in the format shown in the cells. The "UNITS" cell must be entered in all capital letters for the spreadsheet to perform properly. The use of square miles (SQ.MI.) is recommended. It is further recommended that if the units SQ.MI. are used, the user should enter the area

values only to the three decimal places. If greater accuracy is required or if correspondingly accurate data are available, alternate units could be used (e.g. ACRES). Otherwise the use of more than three decimal places implies that that soil map unit areas or land use areas are known to within 1/2 acre certainty. Map unit names must also be entered in all capital letters since the lookup function which finds the appropriate XKSAT values is case sensitive. If the map unit names are not entered properly the spreadsheet will return an "ERR" statement in the XKSAT column for that row.

Enter data only in those cells where you need. The "|" symbol in the first cell of a line tells the printer not to print that entire row. Therefore, these unused lines will be excluded from any printouts made.

After entering the land use, vegetation covers, and initial abstractions (IA) you will move to a cell containing either an "OK" or an "ERR" in the C column at the bottom of the Land Use portion of the table. The "OK" indicates that the total areas entered for all map units and for all land uses are equivalent. An "ERR" indicates that the total areas are different.

To edit a mistake regarding total areas or any other part of the data entry portion of the sheet, simply back up through the sheet using the left arrow key.

Once all data has been entered correctly press "ESC" once. To create a new file containing the table and the calculated subbasin parameters, press Alt-X (i.e. run the XTRACT macro). This will create a new file in the designated drive and directory with the same name as the subbasin name you entered at the beginning.

To begin entering data for the next subbasin on a clean sheet press Alt-N (i.e. run the NEW macro). This will retrieve the spreadsheet program without saving the changes you made upon data entry for the previous subbasin.

When the user is done entering data for all subbasins and the last new file has been created using Alt-X, the spreadsheet and 123 may be exited by running the QUIT macro (i.e. Alt-Q).

Alternatively, Alt-C (macro CLOSE) may be used to close the worksheet without saving the changes to CLARK.WK1 (or SGRAPH.WK1) but keep 123 loaded (i.e. same as /Worksheet Erase Yes).

When the user wishes to print any of the subbasin tables that were created and saved with the XTRACT macro, simply retrieve the file of interest (i.e. File Retrieve and then select the file with the name of the subbasin of interest), and press Alt-P (i.e. run the PRINT macro). **NOTE: The PRINT macro

will not print the proper range if used directly from the CLARK.WK1 or SGRAPH.WK1.**

If an HP Laserjet series printer or equivalent is being used for printouts, the SETUP macro (i.e. press Alt-S) will redefine the global print defaults such that the spreadsheet will fit nicely onto one page with an 1 1/2" left margin. If another type of printer is used, 16.66 pitch at 8 lines per inch will accommodate the spreadsheet to a one page format. If the SETUP macro is used and the LOTUS is used for other purposes the user will have to reset the global print defaults himself.

The SETUP macro also sets the global default to the directory that the user specified in the data entry portion. This will allow printing of all subbasins in the directory more easily since when the user goes to retrieve the next file the default directory will be the one where the subbasins have been saved. To reset the global default directory later, use /Worksheet Global Default Directory and type the drive and directory desired.

Appropriate credit is herewith given to the WLB Group whose spreadsheet for calculating MCUHP input parameters served as an inspiration and foundation for much of this spreadsheet.

Additional spreadsheet programs of interest are S_LAG.WK1, KB.WK1, CLARKSUM.WK1, and SGRPHSUM.WK1.

S_LAG.WK1 provides for the automatic calculation of lag times, the creation of a file saving the calculations table, and the printing of that table. As with CLARK.WK1 and SGRAPH.WK1, ESC must be struck when data entry is completed and before Alt-X can be used. Unlike the Alt-X in the other programs, S_LAG.WK1 requires the user to enter the location and name to save the file under. Alt-Q can be used to quit 123 without saving the changes made to S_LAG.WK1 itself. Alt-C (macro CLOSE) may be used to close the worksheet without saving the changes to S_LAG.WK1 but keep 123 loaded (i.e. same as /Worksheet Erase Yes). Alt-P can be used to print the S_LAG.WK1 sheet. Again, the PRINT macro is designed to print 17 pitch with a 1 1/2" left margin on a HP Laserjet.

KB.WK1 is similar to S_LAG.WK1. It automates calculation of subbasin Kb values.

CLARKSUM.WK1 and SGRPHSUM.WK1 can be used to create summary tables of the MCUHP input parameters calculated in CLARK.WK1 and SGRAPH.WK1. Both programs start in an interactive prompt type mode. The programs allow the user to select the subbasin files where the MCUHP input values are located one at a time until a complete summary table has been created.

The PRINT (Alt-P) macro can be used to print the summary table once the table creation has been completed. These programs do not contain automatic save or xtract commands. It is therefore recommended to manually save the table under a new worksheet name (i.e. /File Save (enter new file name)). Another choice would be to use /File Xtract Values (and specify the name of a new file to xtract to, and then the range to xtract).

LAND USE CATEGORIZATION AND USE FOR CALCULATION OF IMPERVIOUS
AREAS IN URBAN MARICOPA COUNTY

INTRODUCTION

In order to achieve greater standardization and hence reproducibility of hydrologic models, a method of land use classification was developed to aid in the determination of impervious areas in urban and suburban watersheds in Maricopa County. The method utilizes a classification scheme based on simplified versions of municipal land use/zoning maps. In each case, the assignment of a particular parcel to a land use category was confirmed with actual land uses as shown on the most recent Landiscor aerial photographs. Although judgement is still required in the aerial photo interpretation phase, it is believed that the method provides reasonable and largely reproducible results.

The accompanying Table shows how individual zoning map units were grouped into classes based on impervious areas and the corresponding impervious area value for use in calculation of subbasin impervious areas in HEC-1.

EXPLANATION OF PROCEDURES USED IN THE DEVELOPMENT OF THE LAND
USE/IMPERVIOUS AREA TABLE

In the Cave Creek FIS, Burgess and Niple calculated representative percentages of impervious areas found in City of Phoenix zoning classifications including rights-of-way. Utilizing these figures, the zoning units were grouped into six classes according to their similarity in impervious areas. These classes were created to decrease the number of different units that need to be mapped, planimetered, and otherwise accounted for in the hydrologic model. It was felt that this level of generalization was appropriate as it allows for differentiation between significantly different land uses (and hence impervious areas) while still recognizing the limitations of a lumped parameter model such as HEC-1.

Once these impervious area classes were created for the City of Phoenix zoning types, zoning types for the other municipalities represented in (the Gilbert-Chandler Update) were assigned to these classes based on their similarity to the City of Phoenix zoning types. This task was made easier by the fact that many of the zoning types are similarly designated between the various municipalities. In those cases where significantly different zoning types existed, judgement was used to place them in an impervious area class appropriate to that particular land use. Where such designation proved impractical, the zoning type was assigned to the "Miscellaneous" category which were then placed in an impervious class only after interpretation from aerial photography.

Having created a complete classification scheme, aerial photo interpretation and mapping of the impervious area classes was the next step. Utilizing photocopies of the zoning maps

provided on the backs of the most recent Landiscor aerial photographs, zoning types were grouped according to the above developed classification scheme. In every case, the actual aerial photographs were consulted to confirm or disconfirm the correspondence of zoning designation and actual land use to the observed impervious cover. This was done because in some cases areas zoned for a particular use have yet to be developed for that use or the zoning classification has never been updated. "Miscellaneous" zoning types were each individually examined on aerial photographs and assigned to an impervious area class appropriate to the amount of impervious area as seen in the Landiscor aerial photographs.

Land uses/developments may be further segregated based upon the time at which they were constructed. This type of additional division of land uses can be important because drainage requirements and their enforcement have changed over time. New drainage codes have been instituted to require new developments to retain flood waters from precipitation events of a specified frequency and duration. The retention requirements differ between local governments. Furthermore, the extent to which these requirements have been enforced has also varied. Although the timing of the construction of developments had already been established for the Gilbert-Chandler Update, these determinations could be made for other studies by investigation of Landiscor aerial photos for those years of interest.

Once the watershed under study has been mapped for the various land use types and their temporal aspects, lumped values for impervious areas can be calculated for individual subbasins in the watershed.

The accompanying Table shows the impervious area classes for zoning types for the Cities of Phoenix, Mesa, and Chandler, the Town of Gilbert, and Maricopa County.

GILBERT		MESA		CHANDLER	
Map Unit	Description	Map Unit	Description	Map Unit	Description
AG	Agriculture	AG	Agriculture	AG-1	Agriculture
		R1-90	Single Residence		
		SR	Suburban Ranch		
R1-43	Rural				
R1-35	Rural Residential	R1-35	Single Residence	SF-33	Single Family
R1-20	" "			SF-18	Single Family
R1-15	SF, Residential	R1-15	" "		
R1-10	SF, Residential	R1-9	Single Residence	SF-10	Single Family
R1-8	" "				
R1-7	" "	R1-7	" "	SF-7	Single Family
		R1-6	" "		
		TCR-1	Town Ctr, Single Family		
R-2	Duplex	R-2	Restricted Multi.Res.	MF-1	Medium Density
R-3	Multi-Fam., Apartments	R-3	Ltd Multi Res.	MF-2	Multi-Family
R-4	Multi-Fam., General	R-4	General Multi Res.	MF-3	High Density
R-5	Townhouse Residential				
MH	Mobile Home	TCR-2	TC, Restricted Multi.Res	MH-1	Mobile Homes
CTP	Commercial Trailer Park	TCR-3	TC, General Multi. Res.		
C-1	Light Commercial	C-1	Neighborhood Commercial	C-1	Neighborhood Commercial
C-2	General Commercial	C-2	Limited Commercial	C-2	Community Commercial
C-3	Central Commercial	C-3	General Commercial	C-3	Regional Commercial
RS	Residential Services	OS	Office-Service		
RCC	Residential Conveniences	TCC	TC, High Intensity Mixed Use		
		TCB-1	TC, Ltd. Comm./Gen. Mnfct		
		TCB-2	TC, Gen. Comm./Lgt. Mnfct		
I-1	Garden Type Industrial	M-1	Limited Industrial		
I-2	Light Industrial	M-2	General Industrial	I-1	Light Industrial
I-3	General Industrial			I-2	General Industrial
MISCELLANEOUS CATEGORIES: These map units should be evaluated on a case by case basis.					
PAD	Planned Area Development			PAD	Planned Area Development
PSC-1	Planned Ngrbrhd Shopping				
PSC-2	Planned Shopping Center				
IB	Industrial Buffer				
		PEP	Planned Employment Park	PCO	Planned C Offices
		PF	Public Facilities		

Agriculture

RURAL-190	190,000 sq.ft./dwelling	S-1	Ranch or Farm Res., >1 ac	15	Very Low	15
RURAL-70	70,000 sq.ft./dwelling	S-2	Ranch or Farm Commercial	18	Density	15
RURAL-43	One acre/dwelling unit	RE-43	Single Family, 1 acre min	20	Residential	15

R1-35	Sin.Fam.Res., 35,000sqft	RE-35	SF, 35,000 sqft min	22	Low	25
		RE-24	SF, 24,000 sqft min	25	Density	25
R1-18	SFR, 18,000 sq ft/unit	R1-18	SF, 18,000 sqft min	25	Residential	25
		R1-14	SF, 14,000 sqft min	30		25

R1-10	SFR, 10,000 sq ft/unit	R1-10	SF, 10,000 sqft min	38	Medium	45
R1-8	SFR, 8,000 sq ft/unit	R1-8	SF, 8,000 sqft min	45	Density	45
R1-7	SFR, 7,000 sqft/unit				Residential	45
R1-6	SFR, 6,000 sqft/unit	R1-6	SF, 6,000 sqft min	50		45
		R-0	Res. Office	50		45

R-2	2 Family Residence	R-2	MF, 4,000 sqft per unit	60		65
R-3	Multi-Fam., Residential	R-3	MF, 3,000 sqft per unit	65		65
R-4	" "	R-4	MF, 1,500 sqft per unit	65	Multiple	65
R-5	" "	R-4A	MF, 1,000 sqft per unit	70	Family	65
		R-5	" "	70	Residential	65

MHR	Manufctrd Housing, Res	CP/BP	Business Park	65		65
		R-H	Resort District	65		65

C-1	Neighborhood Commercial	C-1	Neighborhood Commercial	95		90
C-2	Intermediate Commercial	C-2	Intermediate Commercial	95		90
C-3	General Commercial	C-3	General Commercial	95		90
					Commercial	
C-0	Commercial Office	C-0	Comm. Office/Rest. Comm.	75		90
		HR	High Rise District	85		90

		IND PARK	Industrial Park	75		75
I-2	Light Industrial	A-1	Light Industrial	75	Industrial	75
I-3	Heavy Industrial	A-2	Heavy Industrial	75		75

PD	Planned Dev. Overlay	PAD	Planned Area Development	85		
----	----------------------	-----	--------------------------	----	--	--

CS	Planned Shopping Center	PSC	Planned Shopping Center	85		
----	-------------------------	-----	-------------------------	----	--	--

SU	Special Uses					
SC	Sr Citizen Overlay	PCD	Planned Community Dev.	60		
NUP	Ngbrhd Plan of Dev.					
RUP	Residential Plan of Dev.					
IUP	Industrial Plan of Dev.					

		R.O.W.	Right of Way	VARIABLE		
		P-1	Parking, Open	VARIABLE		
		P-2	Parking, Structures	VARIABLE		
		D.G.	Dwelling Group	85		

MEETING MINUTES
MEETING DATE FEBRUARY 28, 1992
LOCATION: FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

ATTENDEES:

Pedro Calza	FCDMC	Flood Plain Br Manager
Tim Murphy	FCDMC	Project Manager
Sandy Storey	FCDMC	Project Hydrologist
Jim Barr	Alpha	Project Manager

The watershed boundaries as submitted by Alpha in preliminary form have been reviewed by the FCDMC and concurred with. No reason was found to change the proposed boundaries.

The proposed study reaches that were suggested by Alpha were discussed. The main stream reaches as recommended were concurred with. FCDMC recommended that the northern most branch of the WTW from Sec 12, through Sec 6 and 5 to the Sun Valley Parkway, be the study reach selected from the alternates proposed. Alpha concurred that this was probably the best selection of the four alternates.

Pedro requested that Alpha do an approximate study of the other WTW alternate reaches and delineate a flood boundary for use of the FCDMC in determining development criteria. Alpha will explore this to determine if it can be done without significantly increasing their costs or liability exposure.

No progress has taken place on the alluvial fan study mapping that was to added to our contract by the Special Projects Section.

FCDMC will set up a meeting with Dave Crieghton of ADWR Hydrology Division for next week.

TELEPHONE CONVERSATION RECORD

Date: 92/05/21

Telephone No.: 640-5187

City: PHX

Job Number: 5115

Job Name: INTW

Party Calling/Called: Dave Richmond State Soil Scientist

Position: ARIZ State Office - US SCS

Subject of Call:

Soil # 96 North of the border
on SHEET 43 that matches soil
99 on SHEET 40 of the AQUILA-
CAREFREE SCS SOILS MAPS
SHOULD BE SOIL #99 IN BOTH
CASES

SIGNED: Lin Barr

Page 1 of 1

Copies To: _____

Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, Arizona 85009
(602) 506-1501

FAX # 506-4601

COVER SHEET

TO: JIM BARR

COMPANY
OR DEPT: ALPHA ENGINEERS INC. FAX # 954-6273

FROM: TIM MURPHY

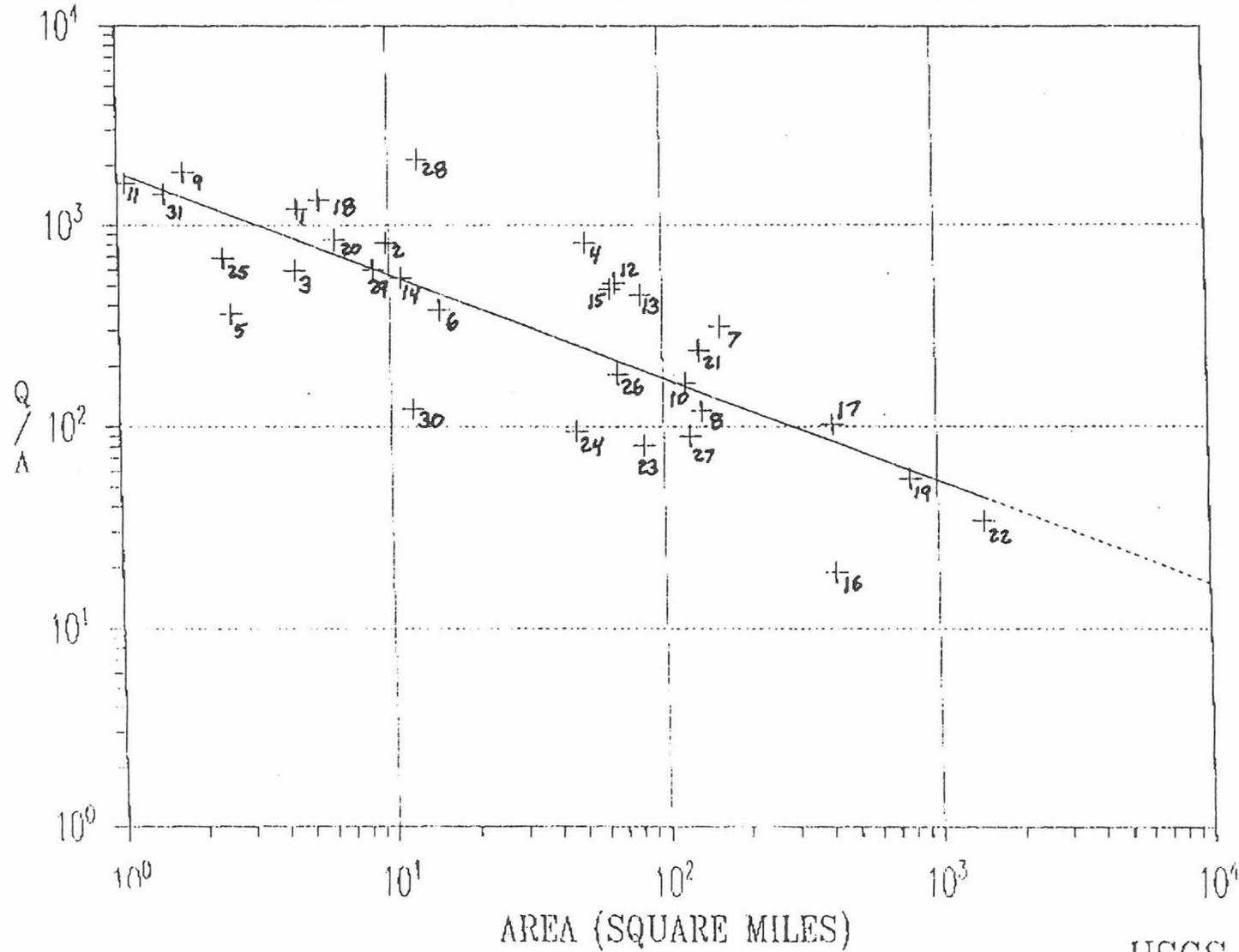
NUMBER OF PAGES BEING SENT INCLUDING COVER SHEET: 4

IF THERE ARE ANY PROBLEMS, PLEASE CALL (602) 506-1501.

COMMENTS: _____

JAN 13 '92 11:11 FROM FLOOD CONTROL

FLOOD FREQUENCY ANALYSIS MARICOPA COUNTY-100 YEAR



DATA UPTO 1989
+ Q100/A

USGS 91-4041

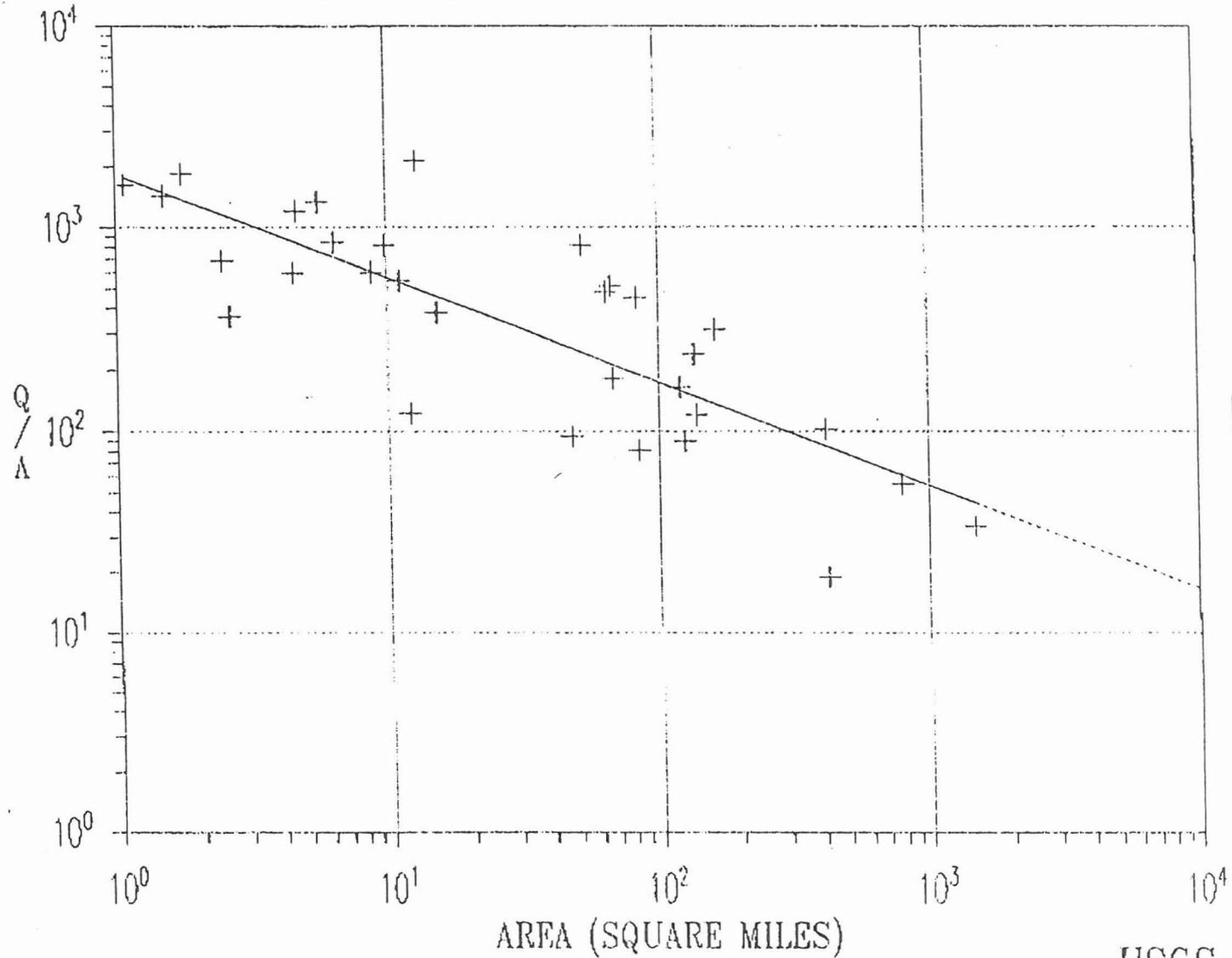
FREQUENCY TABLE 2

PAGE .004

GAGE	gage number	avg slope	AREA	Q100/A	Q-2	Q-5	Q-10	Q-25	Q-50	Q-100
1 WEST SYCAMORE CREEK MCFARLAND	09510070	260.00	4.58	1,207	36	268	702	1,840	3,330	5,530
2 WEST SYCAMORE CR. SUNFLOWER	09510080	353.00	9.80	819	101	519	1,190	2,840	4,920	8,030
3 EAST SYCAMORE CR. SUNFLOWER	09510100	370.00	4.49	595	43	196	428	978	1,660	2,670
4 SYCAMORE SUNFLOWER	09510150	58.60	52.30	816	1,050	4,050	8,160	17,200	27,800	42,700
5 CAMP CREEK SUNFLOWER	09510170	498.00	2.60	365	117	262	390	588	759	950
6 ROCK CREEK SUNFLOWER	09510180	412.00	15.20	381	507	1,340	2,130	3,400	4,530	5,790
7 SYCAMORE NEAR FT. MCDOWELL	09510200	116.00	164.00	313	2,020	6,650	12,300	23,500	35,500	51,400
8 INDIAN BEND WASH AT AZ CANAL	09512100	60.00	139.00	121	378	1,440	2,950	6,400	10,600	16,800
9 SALT RIVER TRIB. SOUTH MNT	09512200	244.00	1.75	1,840	22	171	448	1,140	2,000	3,220
10 CAVE CREEK NEAR CAVE CREEK	09512300	123.00	121.00	165	1,740	4,320	6,870	11,200	15,200	20,000
11 AGUA FRIA TRIB #2, ROCK SPRNGS	09512700	173.00	1.07	1,617	309	565	781	1,110	1,400	1,730
12 NEW RIVER NEAR ROCK SPRINGS	09513780	140.00	67.30	514	2,170	6,260	10,600	18,200	25,600	34,600
13 NEW RIVER AT NEW RIVER	09513800	105.00	83.30	450	3,150	7,880	12,600	20,600	28,300	37,500
14 INDIAN WASH AT STATE 69	09513820	124.00	11.10	547	250	846	1,550	2,900	4,300	6,070
15 BANK CREEK AT I-17	09513860	49.20	64.60	480	967	3,570	6,910	13,700	21,200	31,000
16 WATERMAN WASH, 2.4 ABOVE GILA	09514200	21.20	420.00	19	1,330	2,420	3,380	4,880	6,240	7,840
17 HASSAYAMPA AT BOX DAMSITE	09515500	71.00	417.00	103	3,180	8,480	13,900	23,300	32,270	43,000
18 HARTMAN WASH AT US 60	09515800	71.60	5.57	1,338	218	796	1,550	3,150	4,960	7,450
19 HASSAYAMPA AT NORRISTOWN	09516500	84.90	796.00	55	2,670	7,180	12,200	21,500	31,300	43,900
20 BOX WASH AT US 60	09516600	101.00	6.31	840	194	662	1,240	2,400	3,660	5,330
21 JACKRABBIT WASH (WICK-TOMO)	09516800	34.40	137.00	240	547	2,440	5,300	12,100	20,500	32,900
22 HASSAYAMPA OLD US 80	09517000	39.90	1,470.00	34	2,720	7,470	12,900	23,400	34,500	49,300
23 TIGER WASH NEAR AGUILA	09517280	35.20	85.20	81	1,010	2,120	3,060	4,450	5,630	6,910
24 HUNTERS WASH DS OF AIRLINE RD	09517400	83.70	47.80	95	857	1,540	2,120	2,980	3,720	4,560
25 BENTLEY WASH TRSR. AT US 80	09519600	34.40	2.43	687	484	748	945	1,220	1,440	1,670
26 BENTLEY WASH ALONG I-8	09519750	73.90	68.80	183	466	1,740	3,270	6,150	9,040	12,600
27 BENTLEY WASH AT STATE 85	09519760	46.70	126.00	90	584	1,880	3,310	5,870	8,350	11,400
28 BENTLEY WASH AT STATE 80	09520100	64.40	12.90	2,140	155	1,160	3,120	8,550	16,000	27,600
29 BENTLEY WASH AT STATE 85	09520200	56.00	8.70	600	124	468	946	2,030	3,330	5,220
30 BENTLEY WASH AT STATE 85	09520230	56.00	1.49	1,400	102	329	587	1,060	1,540	2,130

REVISIONS TO THIS REPORT SHOULD BE CONTROLLED

FLOOD FREQUENCY ANALYSIS MARICOPA COUNTY-100 YEAR



DATA UPTO 1989
+ Q100/A

USGS 91-4041

LETTER OF TRANSMITTAL



ALPHA
Engineering
Group,
Inc.

To: Tim MURPHY
FCD MC

Date: 9/1/13
Project: White Tanks Wash
Our No.: 5115
VIA: FAX

Attn: _____

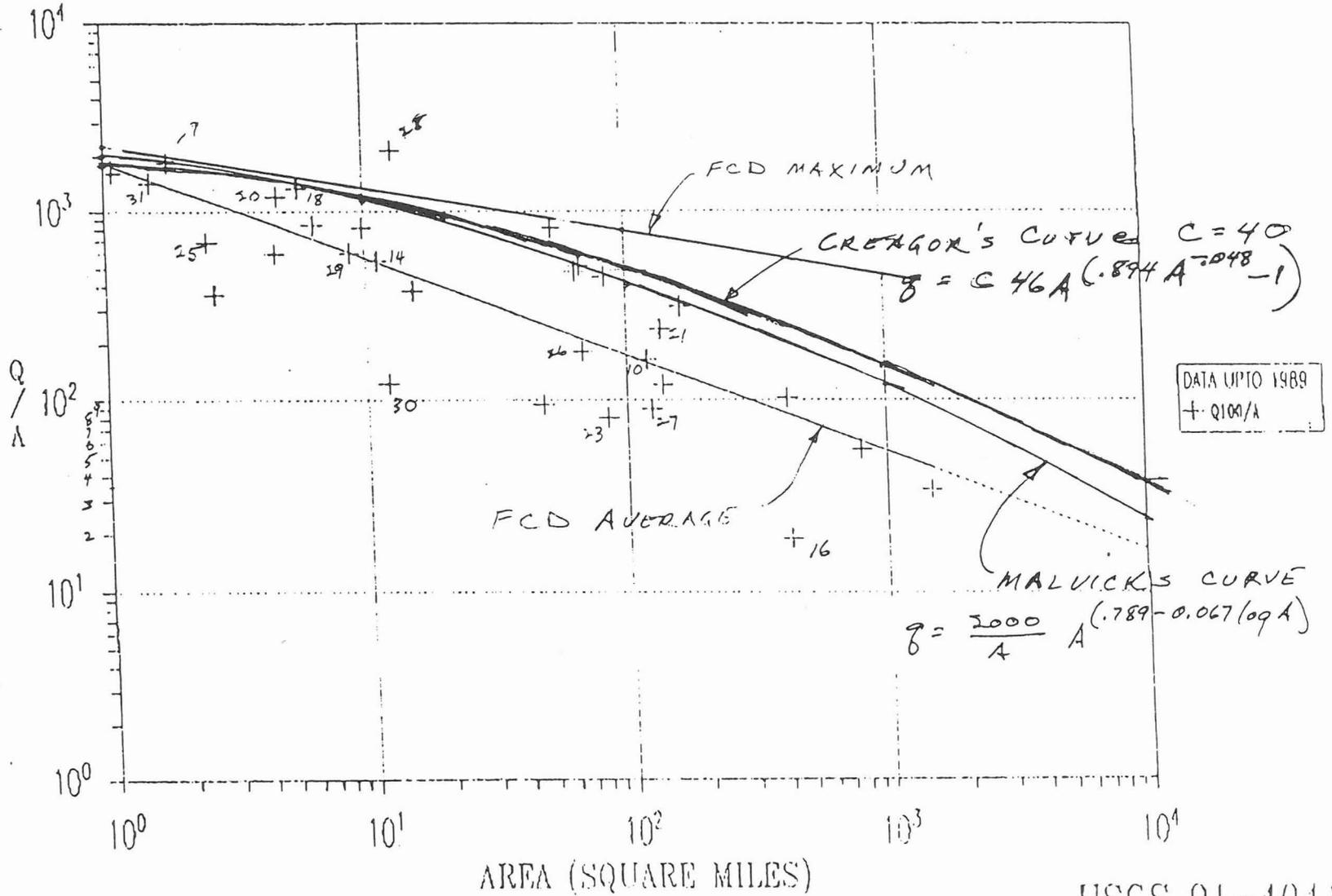
We are sending you: attached via FAX

No. of Copies	Dwg. or Other Number	Title or Description, Remarks
		<u>Thought you'd be interested in these curves</u>

REMARKS: THIS IS PRELIMINARY BUT CREAGOR'S CURVES ARE ENVELOPE'S WITH C=100 for maximum or paleo floor C=40 about a 100 year, & C=30 about a 50 year. If actually applicable at less than maximum, then #28 and #16 & #30 should be checked as too high & too low respectively. Data points have moved in some cases from Fig 7 in
COPIES TO: Dames & Moore!

J. Bar
SIGNATURE

FLOOD FREQUENCY ANALYSIS MARICOPA COUNTY-100 YEAR





11 February, 1992

Hydrology Branch
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, Arizona 85009

ALPHA
Engineering
Group,
Inc.

Attn: Tim Murphy, PM & Sandy Storey, Hydrologist

Subject: Recommended drainage basins and study reach
White Tanks Wash Flood Insurance Study, Contract FCD 90-64

Dear Mr. Murphy:

Attached are four USGS quadrangle maps of the project area marked in pencil with our recommendations for watershed and sub-basins. These basins have been selected with the primary criteria being to delineate boundaries that will remain the boundaries between major watersheds for a considerable length of time or until the next super storm. They represent the best relationship that we have identified between definite mountainous boundaries at the upper end and defined streams at the lower end. In the intermediate area, as the stream beds leave the steep mountainous areas and spread out on the flatter slopes east of the Sun Valley Parkway, the boundaries become indeterminate. Judgement must be used in this area to relate the two defined areas. We would appreciate your review of these boundaries before we finalize them.

We have spent an unusual amount of time and effort on this part of the project, because we feel that proper selection of the drainage basins is the key to a study that will reflect the actual conditions that will occur in a design storm. Accordingly, we have determined the boundaries by following them on the stereo aerial photographs and then transferring those lines to the quadrangle maps. This involved major scale shifts because of the large vertical displacements involved. We feel the method used provided a substantial improvement over just visual transfer. After this work was complete and tentative boundaries had been determined, a field investigation was accomplished. A GPS receiver was used to confirm the locations and photos and notes were taken of each questionable location. Most of these were suspected cross-over locations between proposed watersheds. Based on the field observations, the boundaries were either confirmed or changed to reflect the least transfer of flow between basins.

If you concur with the selections, we feel that cross-over flows between basins can be ignored between the designated watersheds except for those that occur at the Parkway. It will be necessary to complete the hydrology and perform a hydraulic study of the culverts and the ditch along the west side of the Parkway before the amount of crossover can be determined at this location. On the maps, boundaries are shown as solid lines whereas alternate or considered boundaries are shown as dashed lines. The dashed lines



would not appear on the formal submittal, they have been left on the drawings to reduce the effort required to review the submittal and to consider alternates.

In addition we have submitted a proposal for the 12 miles of White Tanks Wash that are to have floodplain and floodway delineations. These are based on the proposed watershed basins and runoff expected from them in the design storm. This map will be revised of course on the basis of the final basin definitions.

We appreciate this opportunity to review the data with you and look forward to incorporating your suggestions into the final draft of the submittal.

Sincerely,

James R. Barr, Project Manager
Alpha Engineering Group, Inc.

Encl

MEETING MINUTES
MEETING DATE FEBRUARY 28, 1992
LOCATION: FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

ATTENDEES:

Pedro Calza	FCDMC	Flood Plain Br Manager
Tim Murphy	FCDMC	Project Manager
Sandy Storey	FCDMC	Project Hydrologist
Jim Barr	Alpha	Project Manager

The watershed boundaries as submitted by Alpha in preliminary form have been reviewed by the FCDMC and concurred with. No reason was found to change the proposed boundaries.

The proposed study reaches that were suggested by Alpha were discussed. The main stream reaches as recommended were concurred with. FCDMC recommended that the northern most branch of the WTW from Sec 12, through Sec 6 and 5 to the Sun Valley Parkway, be the study reach selected from the alternates proposed. Alpha concurred that this was probably the best selection of the four alternates.

Pedro requested that Alpha do an approximate study of the other WTW alternate reaches and delineate a flood boundary for use of the FCDMC in determining development criteria. Alpha will explore this to determine if it can be done without significantly increasing their costs or liability exposure.

No progress has taken place on the alluvial fan study mapping that was to added to our contract by the Special Projects Section.

FCDMC will set up a meeting with Dave Crieghton of ADWR Hydrology Division for next week.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

MEMORANDUM

TO: Jim Barr

FROM: Sandy Story

SUBJECT: White Tanks Wash FDS - Review

DATE: 10-29-92

I have reviewed the submittal for the White Tanks Wash FDS. The submittal consisted of soils maps, watershed map, soils information, and a preliminary HEC-1. My comments are as follows:

1. I would like to see more tables of parameters, see attached.
2. Please list the soil numbers without the decimal places. This causes confusion for the reviewer. Also, please list the lettered soil textures as they appear in the soil survey, in small letters.
3. Sub-basin A1 does not contain soil texture 2 as indicated on the spreadsheet.
4. Please extend areas to no more than two decimal places.
5. How was the vegetative cover determined? Are there any calculations to back this?
6. What does "open area" mean? How was "desert area" determined?
7. Please place sub-basin numbers on the soils map.
8. Which version of the MCUHP programs is being used?
9. In comparison with other watersheds in similar watersheds and having the same types of soils, the soils parameters do not compare. I will need more time to examine this.
10. Please give justification for selection of manning's n. A justification should be given for all parameter estimations..
11. The 24-hour storm must also be analyzed.

The Arizona Republic/The Phoenix Gazette

STATE OF ARIZONA }
COUNTY OF MARICOPA } SS.

JOAN LOHR, being first duly sworn, upon oath deposes and says: That she is the legal advertising manager of the Arizona Business Gazette, a newspaper of general circulation in the county of Maricopa, State of Arizona, published at Phoenix, Arizona, by Phoenix Newspapers Inc., which also publishes The Arizona Republic and The Phoenix Gazette, and that the copy hereto attached is a true copy of the advertisement published in the said paper on the dates as indicated.

The Arizona Republic
~~The Phoenix Gazette~~

Oct. 2, 9, 1991

Joan Lohr

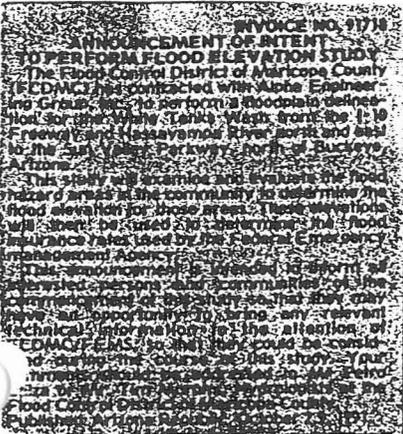
Sworn to before me this

9th day of

October A.D. 19 91



Mary Lee Lee
Notary Public



30-0339

Invoice Number: 91718

The Arizona Republic/The Phoenix Gazette

P.O. BOX 29394
PHOENIX, AZ 85038-9394

DO NOT PAY
FROM THIS INVOICE
Pay from End-Of-Month
Statement. Account No. 015958

ALPHA ENGINEERING GROUP, INC.
Mary Jo Patton
2701 E. Camelback Rd. #100
Phoenix, AZ. 85016-6273

THIS IS YOUR INVOICE FOR THE FOLLOWING LEGAL ADVERTISING:

CATCH LINE	(invoice #)	Class No.	98
Runs:	Republic	Gazette	Purchase Order
1.	Wed. Oct 2, 1991		No. _____
2.	Wed. Oct 3, 1991		Ad _____
3.			Size 1 X 2.19
4.			\$ 257.00
5.			Rate
6.			\$ 564.58
7.			Total
8.			Pre-Payment Exp. 05/92
9.			MC 5480 0160 8810 8906
			Please deduct pre-payment and pay the balance

2701 E. Camelback Rd., Suite 100
Phoenix, AZ 85016-4306
(602) 954-0436 Fax: (602) 954-6273



ALPHA
Engineering
Group,
Inc.

FAX TO: SHARON BUTLER, 1-602-386-4427
BUCKEYE VALLEY NEWS
P.O. BOX 217
BUCKEYE, AZ 85326

FROM: MARY JO PATTON
ALPHA ENGINEERING GROUP, INC.
FAX: 954-6273
PHONE: 954-0436

REQUEST FOR ESTIMATE FOR LEGAL AD.

To be published twice in the Buckeye Valley News.
Two affidavits of publication requested.

\$24⁰⁰

**ANNOUNCEMENT OF INTENT
TO PERFORM FLOOD ELEVATION STUDY**

The Flood Control District of Maricopa County (FCDMC) has contracted with Alpha Engineering Group, Inc., to perform a floodplain delineation for the White Tanks Wash from the I-10 Freeway and Hassayampa River north and east to the Sun Valley Parkway, north of Buckeye, Arizona.

This study will examine and evaluate the flood hazard areas in the community to determine the flood elevation for those areas. These elevations will then be used to determine the flood insurance rates used by the Federal Emergency Management Agency.

This announcement is intended to inform all interested persons and communities of the commencement of this study so that they may have an opportunity to bring any relevant technical information to the attention of FCDMC/FEMA, so that they could be considered during the course of this study. Your comments should be addressed to Mr. Petro Calza or Mr. Tim Murphy, Hydrologists at the Flood Control District of Maricopa County.

BUCKEYE VALLEY NEWS

TELEPHONE 398-4428



Publishing / Printing / Office Supplies

122 S. 4TH ST. - P. O. BOX 217 - BUCKEYE, ARIZONA 85326

FAX NO. 602-386-4427

COVER PAGE

NUMBER OF PAGES: 1

TO: Alpha Eng. Group Inc
954-6273

ATTN: Mary Jo Patton
FROM: Sharon Butler

ADDITIONAL INFORMATION:

The cost to publish the "Announcement
of Intent To Perform Flood Elevation Study
for 2 weeks is \$24.00. We do request
payment in advance. Thanks

RECEIVED

OCT 14 1991

ALPHA Engineering Group, Inc.

*called;
yes.*

Could you please inform me as soon as possible if you wish to publish this announcement in next weeks

2701 East Camelback Road, Suite 100
Phoenix, AZ 85016-4306
(602) 954-0436 Fax: (602) 954-6273



October 11, 1991

Subject: Right of Entry For Surveying Purposes

Parcel No(s): 504-15-218

Dear Property Owner:

The Flood Control District of Maricopa County has contracted with Alpha Engineering Group, Inc., to perform a flood insurance study for White Tanks Wash. The purpose of this study is to determine flood related hazard zones and delineate areas that may be subject to inundation during a "100-year flood" event. According to records at the Maricopa County Assessor's office, you own one or more parcel of land within the limits to the study area.

The intent of this letter is to notify you of the commencement of surveying activities in support of the above mentioned study. In order to perform these surveys it may be necessary to enter your property. This activity should not result in any inconvenience or damage to property. If you have any objections to the entry onto your property you must notify Tim Murphy of the Flood Control District at (602) 262-1501. Otherwise it will be assumed that you consent to the entry onto your property.

The study and resulting maps will be used for floodplain management purposes and submitted to the Federal Emergency Management Agency for flood insurance information and revision of Flood Insurance Rate Maps. This study should be available to the public in about 12 to 18 months.

The Flood Control District and its representatives appreciate your help in assuring the accuracy of this study by allowing access to your property for the surveyors and by providing any information you may have regarding past flooding or related problems.

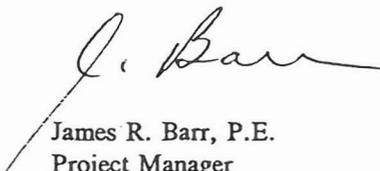
If you have any questions regarding this study or the right of entry, please contact:

Tim Murphy, Hydrologist, Project Manager, Flood Control District of Maricopa County, (602) 262-1501

Jim Barr, P.E., Project Manager, Alpha Engineering Group, Inc., (602) 954-0436

Sincerely,

ALPHA Engineering Group Inc.



James R. Barr, P.E.
Project Manager

**WHITE TANKS WASH
NOTIFICATION OF SURVEY**

<u>CALLS FROM</u>	<u>PARCEL NO.</u>	<u>DATE</u>	<u>REMARKS</u>
Helen Dwinell		10/18/91	OK - was not certain which property this was.
Frances Boyer Hudack Ranch Ltd. Partner		10/18/91	OK - asked when maps available (2yrs).
Joyce & Coleman V. Smith		10/18/91	OK to enter property, want grading done to repair damage caused 8-10 years ago.
Lionel Howard	504-08-175	10/18/91	Wire fence partially down, watch out for some holes also. OK to go on property.
Lee Marvel	504-15-218	10/21/91 letter	OK - requested info.
Mark Laftin	504-08-169	10/21/91	OK - he doesn't know where it is on the ground.
Jack Bramlette	504-15-051 & 2	10/21/91	OK - during daylight hours.
Jack Daniels			OK - county has not maintained roads.
Walter Schleef	504-15-221	10/24/91	OK - mostly curious.
Clara Shephard	504-15-332	10/25/91	OK - mostly curious.
Joseph Roberts	504-08-043 & 048	10/28/91	OK - would like to look at aerial map in Jan. He is near WTW, but high.
Troy Jones for Dwayne Hoover	504-08-194 & 195	10/28/91	OK - inform him if he is in WTW flood zone.
Ed Freeberg	504-15-207	10/28/91 letter	OK? bad investment.

2701 East Camelback Road, Suite 100
Phoenix, AZ 85016-4306
(602) 954-0436 Fax: (602) 954-6273



October 11, 1991

250

FREEBERG EDWARD A & VIOLA R
REDDIN RD
WISCONSIN RAPIDS WI 54494

54475

Subject: Right of Entry For Surveying Purposes

Parcel No(s): 504-15-207

*Red
10/28/91
B.*

Dear Property Owner:

The Flood Control District of Maricopa County has contracted with Alpha Engineering Group, Inc., to perform a flood insurance study for White Tanks Wash. The purpose of this study is to determine flood related hazard zones and delineate areas that may be subject to inundation during a "100-year flood" event. According to records at the Maricopa County Assessor's office, you own one or more parcel of land within the limits to the study area.

The intent of this letter is to notify you of the commencement of surveying activities in support of the above mentioned study. In order to perform these surveys it may be necessary to enter your property. This activity should not result in any inconvenience or damage to property. If you have any objections to the entry onto your property you must notify Tim Murphy of the Flood Control District at (602) 262-1501. Otherwise it will be assumed that you consent to the entry onto your property.

The study and resulting maps will be used for floodplain management purposes and submitted to the Federal Emergency Management Agency for flood insurance information and revision of Flood Insurance Rate Maps. This study should be available to the public in about 12 to 18 months.

The Flood Control District and its representatives appreciate your help in assuring the accuracy of this study by allowing access to your property for the surveyors and by providing any information you may have regarding past flooding or related problems.

If you have any questions regarding this study or the right of entry, please contact:

Tim Murphy, Hydrologist, Project Manager, Flood Control District of Maricopa County, (602) 262-1501

Jim Barr, P.E., Project Manager, Alpha Engineering Group, Inc., (602) 954-0436

Sincerely,

ALPHA Engineering Group Inc.

J. Barr
James R. Barr, P.E.
Project Manager

Mr Tim Murphy -

With regard to my property in Maricopa County, I would not be subject to more expense on this property. It has been nothing but a foolish investment. And I rather not see anything that would oblige me in any way

ACUNA HORATIO B & CATALINA V
1228 W 2ND STREET
SAN PEDRO CA 90732
504-08-033 504-08-036

ADAMS CHARLES W
4636 E FILLMORE
PHOENIX AZ 85008
504-08-151 504-08-152

ADAMS CHARLES W & JOYCE A
4636 E FILLMORE
PHOENIX AZ 85008
504-15-037 504-15-038

ADAMS JAMES P & SHIRLEY L
29824 W VAN BUREN
BUCKEYE AZ 85326
504-15-032Z

ALDABBAGH AMER
% SWENSONS ACCTG SERVICE
8301 N 103RD AVE #18
PEORIA AZ 85345
504-08-102 504-08-109

ALEXANDER HENRY C & LILLIAN C
1416 SECOND ST
CORONADO CA 92118
504-08-136

ALGENE VENTURE
GARDNER AL
2203 E HACKAMORE
MESA AZ 85203
504-03-010 504-03-011

ALLEN DONALD E & DOROTHY R
403 HIGHWAY A1-A #232
SATELLITE BEACH FL 32937
504-08-010

ALTER BARRY
333312 S W 57TH PLACE
FORT LAUDERDALE FL 33312
504-14-093

*Alphabetical
Listing*

504-15-032Z

OCT 14 1991

ALPHA Engineering Group, Inc.

ANDERSON HAROLD D & ELDRRED H
402 W WALWORTH
ELKHORN WI 53121
504-15-098

ANDERSON MARVIN L & MARGARET JEANELLEN
114 SIEBE DR
SUISUN CA 94585
504-08-084 504-08-095

ANDREWS ALFRED
55 W MONROE ST
CHICAGO IL 60613
504-08-157

ANDREWS CHARLES L & ELAINE Z
381 MODEL RD
CUBA CITY WI 53807
504-15-099

ARDIS A PARTNERSHIP
P O BOX 6742
PHOENIX AZ 85005
504-15-022D

ARIZONA STATE OF
1700 W WASHINGTON
PHOENIX AZ 85007
504-08-005E 504-08-005F 504-08-005G 504-16-019J 504-16-019K 504-16-020D 504-16-021C
504-16-023B 504-16-025E 504-16-025F

ARIZONA STATE OF
1793 W JACKSON
PHOENIX AZ 85007
504-15-222 504-15-223 504-15-224 504-15-225 504-15-226 504-15-227 504-15-244
504-15-245 504-15-246 504-15-247 504-15-248 505-15-249 504-15-250 504-15-251
504-15-252 505-15-253 502-15-254 504-15-255 504-15-256 504-15-257 504-15-258
504-15-259 504-15-260 504-15-261 504-15-262 505-15-263 502-15-264 504-15-265
504-15-266 504-15-267 504-15-268 504-15-269 504-15-270 504-15-271 504-15-272
505-15-273 502-15-274 504-15-275 504-15-276 504-15-277 504-15-278 504-15-279
504-15-280 504-15-281 504-15-282 505-15-283 502-15-284 504-15-285 504-15-286
504-15-287 504-15-288 504-15-289 504-15-290 504-15-291 504-15-292 505-15-293
502-15-294 504-15-295 504-15-296 504-15-297 504-15-298 504-15-299 504-15-300
504-15-301 504-15-302 505-15-303 502-15-304 504-15-305 504-15-306 504-15-307
504-15-308 504-15-309 504-15-310 504-15-311 504-15-312

ARIZONA STATE OF
1701 W JACKSON ST
PHOENIX AZ 85007
504-14-001B 504-15-031C 504-15-027X 504-15-028C 504-15-029D 504-15-571 504-16-040B

ARIZONA STATE OF
1739 W JACKSON ST
PHOENIX AZ 85007

504-14-002B 504-14-003B 504-14-141 504-14-142 504-14-143 504-14-144 504-14-145
504-14-146 504-14-147 504-14-148 504-14-149 504-14-150 504-14-151 504-14-152
504-14-153 504-14-154 504-14-155 504-14-156 504-14-157 504-14-158 504-14-159
504-14-160 504-14-161 504-14-162 504-14-163 504-14-164 504-14-165 504-14-166
504-14-167 504-14-168 504-14-169 504-14-170 504-14-171 504-14-172 504-14-173
504-14-174 504-14-175 504-14-176 504-14-177 504-14-178 504-14-179 504-14-180
504-14-181 504-14-182 504-14-183 504-14-184 504-14-185 504-14-186 504-14-187
504-14-188 504-14-189 504-14-190 504-14-191 504-14-192 504-14-193 504-14-194
504-14-195 504-14-196 504-14-197 504-14-198 504-14-199 504-14-200 504-14-201
504-14-202 504-14-203 504-14-204 504-14-205 504-14-206 504-14-207 504-14-208
504-14-209 504-14-210 504-14-211 504-14-212 504-14-213 504-14-214 504-14-215
504-14-216 504-14-217 504-14-218 504-14-219 504-14-220 504-14-221 504-14-222
504-14-223 504-14-224 504-14-225 504-14-226 504-14-227 504-14-228 504-14-229
504-14-230 504-14-231 504-14-232 504-14-233 504-14-234 504-14-235 504-14-236
504-14-237 504-14-238 504-14-239 504-14-240 504-14-241 504-14-242 504-14-243
504-14-244 504-14-245 504-14-246 504-14-247 504-14-248 504-14-249 504-14-250
504-14-251 504-14-252 504-14-253 504-14-254 504-14-255 504-14-256 504-14-257
504-14-258 504-14-259 504-14-260 504-14-261 504-14-262 504-14-263 504-14-264
504-14-265 504-14-266 504-14-267 504-14-268 504-14-269 504-14-270 504-14-271
504-14-272 504-14-273 504-14-274 504-14-275 504-14-276 504-14-277 504-14-278
504-14-279 504-14-280 504-14-281 504-14-282 504-14-283 504-14-284 504-14-285
504-14-286 504-14-287 504-14-288 504-14-289 504-14-290 504-14-291 504-14-292
504-14-293 504-14-294 504-14-295 504-14-296 504-14-297 504-14-298 504-14-299
504-14-300 504-14-301 504-14-302 504-14-303 504-14-304 504-14-305 504-14-306
504-14-307 504-14-308 504-14-309 504-14-310 504-14-311 504-14-312 504-14-313
504-14-314 504-14-315 504-14-316 504-14-317 504-14-318 504-14-319 504-14-320
504-14-321 504-14-322 504-14-323 504-14-324 504-14-325 504-14-326 504-14-327
504-14-328 504-14-329 504-14-330 504-14-331 504-14-332 504-14-333 504-14-334
504-14-335 504-14-336 504-14-337 504-14-338 504-14-339 504-14-340 504-14-341
504-14-342 504-14-343 504-15-014A 504-15-018B 504-15-216 504-15-224 504-15-494
504-15-495 504-15-496 504-15-498 504-15-499 504-15-500 504-15-501 504-15-508
504-15-509 504-15-522 504-15-523 504-15-525 504-15-526 504-15-527 504-15-528
504-15-529 504-15-530 504-15-531 504-15-532 504-15-536 504-15-537 504-15-538
504-15-550 504-15-551 504-15-552 504-15-553 504-15-554 504-15-555 504-15-556
504-15-557 504-16-047

ARIZONA STATE OF
311 ASCOT RD
HILLSBROUGH CA 94010
504-15-015C

ARIZONA STATE OF DEPT OF TRANS
205 S 17TH AVE #330E
PHOENIX AZ 85007
504-16-019N 504-26-019P 504-16-019Q 504-16-019R

ARNETT FRED ROCKNE & SIDNEY A ETAL
2327 E GRANDVIEW CTR
MESA AZ 85203
504-15-056C

ATLANTIC DEVELOPMENT CORP
3314 N VALENCIA
PHOENIX AZ 85018
504-04-007B

AUSTIN WILLIAM LEROY
5824 N 61ST DR
GLENDALE AZ 85301
504-08-133 504-08-138 504-08-148 504-08-155

BAHL DONALD J & RUTH C
RT 1
LANCASTER WI 53814 3
504-15-175

BALL HAROLD L & KATHLEEN B
1323 N 18TH ST
GRAND JUNCTION CO 81501
504-15-485

BANCHIK NORMAN ETAL TR
3080 N CIVIC CENTER PLAZA #25
SCOTTSDALE AZ 85251
504-08-002B

BANNENBERG BUCKEYE AIRPORT LTD PARTNERSHIP
2111 E HIGHLAND SUITE 150
PHOENIX AZ 85016
504-15-019C

BARNES & WAGGENER P C
2025 YORK ST
DENVER CO 80205
504-15-490

BARNHART IRA G & LOUISE M
1571 SENTER AVE
BURLINGTON CO 80807
504-15-449

BARTON CARLOTA E
120 ALAMEDA
NOGALES AZ 85621
504-15-071

BAXTER MARGARET G
LUGO FRANK M JR & MARGARET H
RT 2 BOX 530
BUCKEYE AZ 85326
504-15-039

BAYUK JOHN N & PEARL E
139 CHILCOTT ST
SALIDA CO 81201
504-15-383

BEAUVAIS RICHARD W & THERESA L
3029 E JOHN CABOT DR
PHOENIX AZ 85032
504-15-195

BECKWITH R J & LORRAINE M
1013 6TH AVE WEST
ASHLAND WI 54806
504-15-154

BENISHEK RAYMOND R & DOROTHY M
1611 5TH AVE
ANTIGO WI 54409
504-14-027 504-14-028

BENNETT RICHARD S & ELISE MARIE
1822 CALISTOGA ST
PITTSBURGH PA 15221
504-08-064

BERANEK C PAUL & GARLYN E
314 LINCOLN AVE
BARABOO WI 53913
504-15-237

BERNSTEIN LAWRENCE H & FRANCES R
4209 EUCLID
TAMPA FL 33629
504-08-032 504-08-037

BESS EULA M
310 N 83RD ST
MESA AZ 85207
504-08-060

BIDDLECOME LEO T & VIOLA M
RT 2 BOX 852
BUCKEYE AZ 85326
504-15-022A

BIGLEY RITA A
RITA BIGLEY OMDAHL
7159 WREN COURT
VENTURA CA 93003
504-08-088

BIRMINGHAM JAMES J
1801 I PARKCOURT PL #101
SANTA ANA CA 92701
504-07-003C 504-07-003D 504-07-004A 504-07-004B 504-07-006 504-08-004D 504-08-004E
504-08-004F 504-08-004G 504-15-032E

BIRMINGHAM JAMES J & HELGA
1801 I PARKCOURT PL #101
SANTA ANA CA 92701
504-08-005L 504-08-005M 504-08-005N 504-08-006A 504-08-006C 504-08-006D
504-16-013B

BLAIR DEAN & LORENE
604 DONNER
LAS VEGAS NV 89107
504-15-507

BLAY ROBERT A
8233 W NORTHERN
GLENDALE AZ 85030
504-15-041D

BLOCK RICHARD F & SONJA M
RT 1 BOX 4
BIRNAMWOOD WI 54414
504-14-014

BOHREN JOHN F & ALICE M
52 COCHISE RD
CHEROKEE VILLAGE AR 72525
504-14-038

BOLIN BOBBY D & BETTY LOU OLIVER
RT 2 BOX 124-A
TOLLESON AZ 85353
504-15-060

BOSCHAM GERBEN & JENNY
RT 2 8921 W BROADWAY
TOLLESON AZ 85353
504-15-032F

BOSS PHILLIP C & ETTA MAE
ROUTE 2 BOX 623
BUCKEYE AZ 85326
504-15-588

BOWMAN DONOVAN D & MARGARET K
2208 E ELMWOOD
MESA AZ 85203
504-08-045

BOYCE ARTHUR & ELLEN M
5118 SHENIEN DR
MADISON WI 53716
504-14-054

BOYD WILLIAM T
P O BOX 5002
GREELEY CO 80631
504-15-482

BOYLE JOHN J
5895 SW 35TH ST
MIAMI FL 33155
504-16-023A

BRADY BETTY ANN ETAL
460 W VALORO DR
TUCSON AZ 85704
504-04-005D

BRADY ISABELLE ETAL
431 N TREAT AVE
TUCSON AZ 85704
504-04-005C

BRAMLETTE JACK C & IDA M
19044 W LYNWOOD RD RT 1
BUCKEYE AZ 85326
504-15-051B 504-15-052

BRANCHAW JOSEPH B & DORA M
6702 KIPLING ST
ARVADA CO 80004
504-15-393

BREngle KENNETH G & DONNA E
3812 CRESCENT DR
FT COLLINS CO 80526
504-15-455

BRIERLY DOUGLAS J & JOAN
724 MILWAUKEE AVE
BURLINGTON WI 53015
504-15-083

BRITO GUADALUPE C & TAMMY L
29139 W ROOSEVELT ST
BUCKEYE AZ 85326
504-15-049D

BRODIE JOHN A & MARY E
132 RIVERVIEW DR
THIENSVILLE WI 53092
504-15-081

BROOKE PAUL F JR & JUDY C
29153 W ROOSEVELT ST
BUCKEYE AZ 85326
504-15-047C

BROWN JOHN DOUGLAS
P O BOX 1605
DENISON TX 75020
504-08-103

BRUCE JERRY W & EULA MAE
310 N 83RD ST
MESA AZ 85201
504-08-050

BRUNSON RICHARD K & LENICE M
R 1 NORFIELD RD
LITTLE SUAMICO WI 54141
504-15-161

BRYANT RAYMOND
12201 46TH AVE SO
SEATTLE WA 98178
504-08-085 504-08-094 504-08-099 504-08-100 504-08-101 504-08-110

BUCKEYE VALLEY RURAL VOLUNTEER FIRE DEPT
P O BOX 75
BUCKEYE AZ 85326
504-15-027Y 504-15-569B 504-15-569C

BURDGES CARROLL H & ZELDA R
STAR ROUTE
WALSH CO 81090
504-15-446

BURGE LAWRENCE M & CIPRIANA M
1133 E STATE AVE
PHOENIX AZ 85020
504-08-011 504-08-014 504-08-015

BURKHOLDER EDWARD L & CAROL J
58333 IRONWOOD DR
ELKHART IN 46516
504-15-377

BURN/ROSEHAUGH/MOUNTLEIGH ASSOCIATES
4520 N CENTRAL AVE #400
PHOENIX AZ 85012
504-03-016 504-03-017

BURNS INTERNATIONAL INC
4520 N CENTRAL AVE #500
PHOENIX AZ 85012

504-14-008	504-14-009	504-14-012	504-14-017	504-14-018	504-14-019	504-14-020
504-14-021	504-14-022	504-14-023	504-14-026	504-14-029	504-14-030	504-14-037
504-14-040	504-14-041	504-14-042	504-14-046	504-14-048	504-14-049	504-14-050
504-14-057	504-14-059	504-14-061	504-14-062	504-14-063	504-14-064	504-14-065
504-14-066	504-14-068	504-14-069	504-14-070	504-14-071	504-14-072	504-14-073
504-14-074	504-14-075	504-14-076	504-14-077	504-14-078	504-14-079	504-14-080
504-14-081	504-14-082	504-14-083	504-14-084	504-14-085	504-14-086	504-14-087
504-14-088	504-14-089	504-14-090	504-14-094	504-14-095	504-14-096	504-14-097
504-14-098	504-14-099	504-14-100	504-14-101	504-14-102	504-14-103	504-14-104
504-14-105	504-14-106	504-14-107	504-14-108	504-14-109	504-14-110	504-14-111
504-14-112	504-14-113	504-14-114	504-14-115	504-14-116	504-14-117	504-14-118
504-14-119	504-14-120	504-14-121	504-14-122	504-14-123	504-14-124	504-14-125
504-14-126	504-14-127	504-14-128	504-14-129	504-14-130	504-14-131	504-14-132
504-14-133	504-14-134	504-14-135	504-14-136	504-14-137	504-14-138	504-14-139
504-14-140	504-15-065	504-15-067	504-15-072	504-15-097	504-15-101	504-15-102
504-15-103	504-15-107	504-15-108	504-15-109	504-15-112	504-15-117	504-15-118
504-15-122	504-15-124	504-15-128	504-15-137	504-15-140	504-15-141	504-15-142
504-15-143	504-15-153	504-15-155	504-15-158	504-15-162	504-15-164	504-15-165
504-15-168	504-15-170	504-15-173	504-15-177	504-15-181	504-15-182	504-15-183
504-15-188	504-15-196	504-15-203	504-15-211	504-15-213	504-15-219	504-15-230
504-15-232	504-15-233	504-15-239	504-15-242	504-15-314	504-15-315	504-15-316
504-15-317	504-15-324	504-15-325	504-15-328	504-15-329	504-15-331	504-15-333
504-15-335	504-15-337	504-15-338	504-15-341	504-15-343	504-15-348	504-15-349
504-15-350	504-15-354	504-15-359	504-15-361	504-15-363	504-15-364	504-15-365
504-15-366	504-15-367	504-15-368	504-15-373	504-15-374	504-15-376	504-15-385
504-15-387	504-15-388	504-15-389	504-15-391	504-15-392	504-15-396	504-15-399
504-15-400	504-15-401	504-15-402	504-15-403	504-15-404	504-15-406	504-15-407
504-15-414	504-15-416	504-15-417	504-15-418	504-15-420	504-15-424	504-15-427
504-15-428	504-15-431	504-15-440	504-15-441	504-15-447	504-15-452	504-15-453
504-15-454	504-15-458	504-15-463	504-15-468	504-15-471	504-15-472	504-15-477
504-15-480	504-15-481	504-15-483	504-15-487	504-15-488	504-15-491	504-15-492
504-15-504	504-15-505	504-15-510	504-15-511	504-15-512	504-15-516	504-15-521

504-15-533 504-15-534 504-15-535 504-15-540 504-15-541 504-15-542 504-15-544
504-15-545 504-15-546 504-15-548 504-15-549 504-16-019D 504-16-169

BUSH JACK L SR & VALETA
201 LAWRENCE BLVD
AVONDALE AZ 85323
504-08-002Q

BUSHMAN JEROME J & BARBARA A
P O BOX 11
GALLOWAY WI 54432
504-15-123

BUSHMAN JOHN J & SADIE
RT 1
WITTENBERG WI 54499
504-15-131

BUSS VICTOR W & ROSE MARIE E
708 GROVE ST
BEAVER DAM WI 53916
504-15-096

C-D BUCKEYE AIRPORT LTD PARTNERSHIP
2111 E HIGHLAND SUITE 150
PHOENIX AZ 85016
504-15-015F

CAMELBACK & SUN VALLEY 317
GILBERT & GREER
3409 E GRANDVIEW
MESA AZ 85213
504-04-002

CAMPBELL BEVERLY K
% BEVERLY K ETCHELLS
2848 E CLARENDON
PHOENIX AZ 85016
504-08-007 504-08-012 504-08-013

CANADA MINNIE
1406 W 36TH PL
LOS ANGELES CA 90018
504-04-001A 504-04-001E

CANAS ENRIQUE J & LILY S
3265 DE OVAN AVE
STOCKTON CA 95204
504-15-539

CARLSON LLOYD Q & EVELYN I
1549 S VAN GORDON CT
LAKEWOOD CO 80288
504-15-422

CARTER JOSEPH GEORGE & VIRGINIA
P O BOX 28040
DALLAS TX 75228
504-08-142

CARTRIGHT ROBERTA SUE TR
542 N ALMA SCHOOL RD
MESA AZ 85201
504-15-046

CASHMAN JUNE M
5327 N 79TH WAY
SCOTTSDALE AZ 85253
504-15-421

CASTILLO CAMALIEL P & ALICE D
1202 S 14TH ST
PHOENIX AZ 85034
504-16-029

CASTILLO ELIA
1341 E BUCKEYE RD/REAR/
PHOENIX AZ 85034
504-16-028

CASTILLO SAM
8644 W DALY LN
PEORIA AZ 85345
504-16-038 504-16-042

CATON CARL ERNEST & CYNTHIA ANNE
1654 N ROSE CIR
MESA AZ 85203
504-08-061

CATTELL NANCY J
P O BOX 1405
KISSIMMEE FL 32741
504-15-371

CHANDLER JUNE E
P O BOX 3
SIREN WI 54872
504-15-120

CHASE EDWIN D & FERN H
559 GUNNISON AVE
GRAND JUNCTION CO 81501
504-15-439

CHILDRESS HOYTT & KATHERINE A
1821 SW 99 CT
MIAMI FL 33165
504-08-129

CHRISTIANSSEN DUANE E & PEGGY A
N 17TH ST
GLADSTONE MI 49837
504-14-045

CIHASKI VILAS J & SHIRLEY M
N-4320 PINE RD
BIRNAWOOD WI 54414
504-14-013

CLAMPITT CLIFFORD V & LYNNE V
2016 J-25 RD
AUSTIN CO 81410
504-15-438

CLARK H JAMES
2802 DEMMING BLVD
CHEYENNE WY 82001
504-15-334

CLEMENTZ ERNEST J & MARGARET
710 WELSLACO TR PK
WESLACO TX 78596
504-15-515

CLERKIN PAUL V & ELIZABETH
P O BOX 11487
DENVER CO 80211
504-15-394

CLOWARD ROBERT J & ANTHONY J
P O BOX 37764
PHOENIX AZ 85069
504-15-579

COLE VERNON G & NETTIE
781 COLLEGE ST
SPRINGFIELD CO 81073
504-15-474

COLESON JAY W & LEOLA V
4210 NAVARRE AVE
SEBRING FL 33870
504-15-073

COLLINS ALBERT E & EILEEN M
701 E MINER
LADYSMITH WI 54848
504-15-200

CONDON-DAVIS-A INTERCHANGE LTD PTN
2111 E HIGHLAND SUITE 150
PHOENIX AZ 85016
504-16-013D

CONDON-DAVIS-B INTERCHANGE LTD PTN
2111 E HIGHLAND SUITE 150
PHOENIX AZ 85016
504-16-013E

CONDON-DAVIS-C INTERCHANGE LTD PTN
2111 E HIGHLAND SUITE 150
PHOENIX AZ 85016
504-16-014C 504-16-015

CONDON-DAVIS-D INTERCHANGE LTD PTN
2111 E HIGHLAND SUITE 150
PHOENIX AZ 85016
504-16-014B

CONDON-DAVIS-E INTERCHANGE LTD PTN
2111 E HIGHLAND SUITE 150
PHOENIX AZ 85016
504-16-012A

COOK GERALD W & ELAINE J
1350 BROOK ST APT A
ST CHARLES IL 60174
504-15-070

COOK JEFFERY
3627 CAMINO SIN NOMBRE
PARADISE VALLEY AZ 85253
504-15-021

COPPERSTATE LAND CO
20 E MAIN ST STE 785
MESA AZ 85201
504-08-160 504-08-162

CORNERSTONE PARTNERSHIP
1302 E TONTO LN
PHOENIX AZ 85024
504-15-022C 504-15-022E

COWLEY-CARDON
2034 W SOUTHERN AVE
MESA AZ 85202
504-16-043B

COX FRANCES J
55 W MONROE ST
CHICAGO IL 60613
504-08-146

COYIER ROBERT F & DARLENE H
RT 3
MINERAL POINT WI 53565
504-15-176

CRANDALL RONALD L & NANCY M
3138 W BECK LN
PHOENIX AZ 85023
504-16-027

CRAWFORD LYNN A
8227 W MULBERRY
PHOENIX AZ 85033
504-04-006D

DANIEL JACK P
2228 PARK MARINA DR
REDDING CA 96001
504-08-066 504-08-069

DAVIS-MELBY BUCKEYE AIRPORT LTD PARTNERSHIP
2111 E HIGHLAND SUITE 150
PHOENIX AZ 85016
504-15-019E

DESENS DONALD J & DIANE K
1713 TAYLOR LN
WEST BEND WI 53095
504-15-092

DESERT SUNRISE PARTNERSHIP
2198 E CAMELBACK RD #305
PHOENIX AZ 85016
504-72-017D

DIAZ JOE AND DONNA
4009 E AVALON DR
PHOENIX AZ 85018
504-16-045 504-16-040A

DICKEY WILLIAM D JR ETAL
1140 E WASHINGTON STE 102
PHOENIX AZ 85034
504-16-041

DOAN CLIFFORD F
236 SOUTH ST
MINERAL POINT WI 53565
504-15-113

DOBRA CHARLES W & MARY JEAN
2846 N NATCHEZ
CHICAGO IL 60634
504-16-024D

DOLAN GEORGE A
BOX 10894
SPRINGFIELD MO 65808
504-15-220

DRAKE RALPH W & MARY G
201 BRAWLEY ST
STEVENS POINT WI 54481
504-15-139

DRISCOLL EDWARD R & CATHERINE C
1014 4TH AVE
ANTIGO WI 54409
504-14-036

DUBY CHARLES H & LENA M
113 E 3RD ST
COFFEYVILLE KS 67337
504-08-026 504-08-098

DUNCAN NORMAN L
7301 N 12TH ST
PHOENIX AZ 85020
504-08-002K

DUNNING JOHN E & ALICE J
ROUTE 2 BOX 554
BUCKEYE AZ 85326
504-15-035B

DWINELL WILLIAM G & HELEN JOY
12336 CHERRY HILLS W
SUN CITY AZ 85315
504-15-075 504-15-082

EASTER JERRY M & BETTY L
RT 2 BOX 645
BUCKEYE AZ 85326
504-15-573

EASTERDAY LEONARD E
RT 2 BOX 478
BUCKEYE AZ 85326
504-08-002D

ECHTNER ROBERT L & PHYLLIS F
P O BOX 191
SHAWANO WI 54166
504-15-208

ECK STANLEY G & DOROTHY
519 W MAPLE ST
LANCASTER WI 53813
504-15-184

EGGERT GERHARDT J & RUTH A
128 W CUMBERLAND ST
BERLIN WI 54932
504-15-078

EMERSON ROBERT P & THELMA F
4113 S 6TH AVE
PHOENIX AZ 85013
504-15-589

ENG LARRY B & MIEKO ETAL
SAYMART INC
224 E MONROE
BUCKEYE AZ 85326
504-15-024

ENG LARRY B & MIEKO ETAL
174 BAHIA LN EAST
LITCHFIELD PARK AZ 85340
504-15-023

ENGLISH JOSEPH ETAL
1800 S AUSTIN BLVD
CICERO IL 60650
504-08-005H 504-08-005J 504-08-005K

EPI PLAN INVESTMENTS II
1741 E MORTON
PHOENIX AZ 85020
504-15-030B

ERKER GARY N & LINDA D
1390 HWY 385
BURLINGTON CO 80807
504-15-442 504-15-443 504-15-470 504-15-518 504-15-519

ETTER ELLEN A
1037 E GLENROSA
PHOENIX AZ 85014
504-04-006C

EVO-ORA FOUNDATION ETAL THE
2525 E BROADWAY STE 111
TUCSON AZ 85716
504-04-005F

FAHERTY HAROLD H & LUCILLE C
705 LUTHERAN ST
PLATTEVILLE WI 53818
504-15-171

FAIRALL J P
5239 W ILIFF DR # 101
LAKEWOOD CO 80227
504-15-520

FAIRBANKS VAYLORD M & PATRICIA A
3 VALLEY VIEW LANE
BENTONVILLE AR 72712
504-15-127

FARRAR WOODROW J & DOROTHY JANE
15023 N 25TH PL
PHOENIX AZ 85032
504-08-105

FARROW FLOYD KEITH & KATHERINE L
7113 N W 18TH ST
BETHANY OK 73008
504-15-187

FIELD HAROLD B & MINA L
BOX 153
JUSTIN TX 76247
504-15-464

FIRST AMERICAN TITLE INS CO TR #7554
TRUST DEPT
111 W MONROE STE 600
PHOENIX AZ 85003
504-04-004

FIRST AMERICAN TITLE INS CO TR #7537
111 W MONROE ST STE 600
PHOENIX AZ 85003
504-07-007A 504-07-008

FIRST AMERICAN TITLE INS CO OF AZ
4520 N CENTRAL AVE STE 210
PHOENIX AZ 85012
504-15-085

FIRST AMERICAN TITLE TR 7601
MCMICHAEL LLOYD J & ESTHER E
P O BOX 1766
GARDEN CITY KS 67846
504-15-380 504-15-381

FIRST AMERICAN TITLE TR 7601
FRIGON MERYLN D & LORRAINE
4907 E MARILY RD
SCOTTSDALE AZ 85254
504-15-502

FIRST INTERSTATE BANK OF AZ TR
2233 E ROVEY
PHOENIX AZ 85016
504-08-126

FIRST INTERSTATE BANK OF AZ TR
C/O BARBARA CONNER
2233 E ROVEY
PHOENIX AZ 85016
504-08-075 504-08-114 504-08-115

FISHER JAMES R
P O BOX 1531
SOUTHGATE CA 90280
504-15-032X

FLANAGAN TODD W & KAY T
% KAY T CHASE
33 TRAILRIDGE
SPRINGFIELD IL 62704
504-08-092

FONG CHONG
9102 W TAYLOR
TOLLESON AZ 85353
504-08-057

FORREST LOYD H & CYNTHIA
37980 ROAD 80
DINUBA CA 95618
504-15-031D 504-15-582

FOSS NORMAN P & BARBARA B
13992 E MARINA DR #201
AURORA CO 80014
504-15-346

FREEBERG EDWARD A & VIOLA R
REDDIN RD
WISCONSIN RAPIDS WI 54494
504-15-207

GAONA NICHOLAS S & ARMIDA
RT 1 BOX 356A
LAVEEN AZ 85339
504-16-034

GARCIA BETTY J TR
19615 N 98TH AVE
PEORIA AZ 85326
504-15-027M 504-15-033 504-15-041J 504-15-041L 504-15-061A 504-15-064A 504-15-574D

GARCIA CONCHA C
417 E DORRIS AVE
AVONDALE AZ 85323
504-15-048A

GARCIA FREDDIE A & FRANCES
P O BOX 231
BUCKEYE AZ 85326
504-15-041H

GARCIA JOE D & BETTY J
AGUIRRE JOSE L & ROSA P
4917 W MONTE VISTA
PHOENIX AZ 85035
504-15-575C

GARCIA JOE D & BETTY J
MOORE CARL WAYNE
RT 2 BOX 510
BUCKEYE AZ 85326
504-15-051D

GARCIA JOE D & BETTY J
4422 N 105TH AVE
PHOENIX AZ 85039
504-15-574A 504-15-753C

GARCIA PATRICK G & PRISCILLA M
BOX 152
MONTROSE CO 81401
504-15-493

GARNER WESTSIDE PARTNERSHIP II
GARDNER AL
2203 E HACKAMORE
MESA AZ 85203
504-04-003 504-04-014 504-06-015A 504-06-015B 504-06-016 504-06-019 504-06-020
504-07-009 504-07-010 504-07-011

GARZA FRANK J/DEBORAH A
1533 W BEHREND DR
PHOENIX AZ 85027
504-15-426

GASPAR ALBIN G & ROSA
300 WESTERN AVE
WATERTOWN WI 53094
504-14-137

GENTILE FRANK R & MARJORIE B
3945 S SHERMAN ST
ENGLEWOOD CO 80110
504-15-322

GILPIN MICHAEL K
1308 E PERSHING
RIVERTON WY 82501
504-08-171

GILPIN ROBIN L
1308 E PERSHING AVE
RIVERTON WY 82501
504-08-074

GOAD JIMMIE L & GEORGIA L
107 WASHINGTON DRIVE
SALINAS CA 93905
504-08-137

GOBEL WALTER E SR & ALMA A
2731 N BUTLIN DR
BELOIT WI 53511
504-15-079

GOEPFERT ELEANOR
2804 16TH
MONROE WI 53566
504-15-115

GOFFIN BRADLEY R & MARITA M
P O BOX 74
LADYSMITH WI 54848
504-15-147

GOLBACK DAVID L R & BEVERLY A ETAL
701 DELEGLISE ST
ANTIGO WI 54409
504-15-077

GOLLEHER MARGARET RUTH
316 E DUNBAR
TEMPE AZ 85282
504-08-004H 504-08-004J 504-08-004K

GONZALES PEDRO P & YVONNE R
RT 2 BOX 479
BUCKEYE AZ 85326
504-15-063B

GONZALES SUSIE E
4835 W 29TH AVE
DENVER CO 80212
504-15-352 504-15-355

GOODSON JOHN F TR
2025 N 3RD ST STE 200
PHOENIX AZ 85004
504-14-052 504-14-055 504-14-058 504-15-148 504-15-156 504-15-157 504-15-159
504-15-185 504-15-197 504-15-209 504-15-215 504-15-229

GORDON HELEN MARGUERITE
7040 W MORROW DR
GLENDALE AZ 85308
504-08-119 504-08-020

GOSNELL LISA D
P O BOX 921
HOBBS NM 88241
504-08-173 504-08-174

GOUFF EDYTHE E
1908 29TH AVE
GREELEY CO 80631
504-15-517

GOULD LYDIA B
7208 HWY 60 W
HARTFORD WI 53027
504-15-190

GRADY THEODORE H & DOROTHY M
5202 N 8TH PL APT #41
PHOENIX AZ 85014
504-14-032

GRIESBACH FRED J
3300 8TH ST SO
WISCONSIN RAPID WI 54494
504-15-074

GRIFFIN LESTER J & BOBBIE J
14219 N 37TH WAY
PHOENIX AZ 85032
504-08-144

GRIFFIN MAXINE K
27 S CENTRAL
AVONDALE AZ 85323
504-08-145 504-08-158 504-08-161 504-08-182 504-08-183

GRIM SAMUEL B & MARILYN A & GARY
14624 N 9TH ST
PHOENIX AZ 85022
504-16-010

GUEST DONALD J & JUDY A
19641 W MEDLOCK
LITCHFIELD AZ 85340
504-08-116

GUSTAFSON MYRON C & RUTH C
STAR RT BOX 129 CACTUS RANCH #71
MORRISTOWN AZ 88342
504-14-025

GUTIERREZ MIGUEL & EMME M
P O BOX 644
EL MIRAGE AZ 85335
504-15-047B

HAGENMAIER ERNEST PAUL & MARY C
1733 BROKEN ARROW DR
PRESCOTT AZ 86303
504-16-020C

HAGLAND DENNIS R
1025 CO S-AIA
PATRICK AFB FL 32925
504-15-150

HAHN MEREDITH J & BONNIE M
RT 2 BOX 483
BUCKEYE AZ 85326
504-08-177

HAIGES HOWARD JR & MARY ELLEN
28797 BUFFALO PARK
EVERGREEN CO 80439
504-15-503

HAIR DANNY D & RONDA K
2809 W RUTH AVE
PHOENIX AZ 85021
504-14-051

HALL NANCY E & DYER GARY & VICKIE M
18230 N 39TH DR
GLENDALE AZ 85308
504-15-448

HANLON VALLIE JO
4407 S 36TH AVE
PHOENIX AZ 85041
504-08-122

HANNA JERRY LEROY & SANDRA K
RT 2 BOX 620
BUCKEYE AZ 85326
504-15-575B

HANSEN OLIVIA & LYDIA E
312 CAMBRIDGE ST
BRUSH CO 80723
504-15-375

HARASHA RALPH E & DOROTHY I
940 RIDGE AVE
LANCASTER WI 53813
504-15-234

HARING CLEMENT & AUDREY
128 E SOMO AVE
TOMAHAWK WI 54487
504-15-204

HARMON JOHN D & DELORES A
MANLEY LEWIS M & EVELYN M ETAL
RT 2 BOX 403
BUCKEYE AZ 85326
504-15-027G 504-15-566 504-15-568

HARNIK AGNES
4730 S SPRINGFIELD AVE
CHICAGO IL 60632
504-08-159 504-08-176

HARRIS BUCKEYE AIRPORT LTD PARTNERSHIP
2111 E HIGHLAND SUITE 150
PHOENIX AZ 85016
504-15-019D

HARRISON JESSE D & LILLIAN L
BOX 235
BRUSH CO 80723
504-15-408

HART JERRY B
1600 SIEBARTH DR
LAKE CHARLES LA 70601
504-08-143

HASBROUCK CLARENCE M & JULIE I
5604 W MISSION LANE
GLENDALE AZ 85302
504-08-167 504-08-168

HATTON MARY A
4301 N 50TH AVE
PHOENIX AZ 85031
504-15-032P

HAUCH HERBERT C & CLARA I
8848 HWY 22
OCONTO FALLS WI 54154
504-15-214

HAYASHI HOWARD H & JEANMARY S
505 BEL PL
RANTOUL IL 61866
504-15-320

HAYWARD HAZEL H
12700 ELLIOT AVE SP 372
EL MONTE CA 91732
504-08-034 504-08-035

HAZZARD DONALD L ETAL
1863 E OXFORD DR
TEMPE AZ 85283
504-16-017A 504-16-017B 504-16-017C

HEARN GERALD DALE & MARY ANN TR
2308 E JACARANDA
MASE AZ 85203
504-08-002H 504-15-048B

HEIDEMANN ELAINE V & EUGENE E
N5104 CTY G
BEAVER DAM WI 53916
504-15-068

HEIM ROYAL R & DONNA M
4959 6TH ST S
WINONA MN 55987
504-08-184

HEIMAN DEAN A & DORIS V
3351 PATTON ST
EAU CLAIRE WI 54701
504-15-180

HELMS STEVE & MAXEEN LYNN
318 N 83RD ST
MESA AZ 85207
504-08-059

HENRY DAVID L GRAGG GEORGE D
798 LEYDEN ST
DENVER CO 80220
504-15-319

HERNANDEZ RAFAELA V
RT 2 BOX 549
BUCKEYE AZ 85326
504-15-035C

HERON FINANCIAL CORPORATION
#917 HERON BLDG
510 W 6TH ST
LOS ANGELES CA 90014
504-04-016 504-04-017 504-08-002L 504-08-009 504-08-024 504-08-025 504-08-127
504-08-192 504-08-193 504-03-005A 504-03-005B

HERRIAGE CARL A & ROSE M
310 N 293RD AVE
BUCKEYE AZ 85326
504-15-034

HILBURN HARRIET B
5327 ELDEN DR
DALLAS TX 75220
504-08-016

HINKLE PAUL D & ILA MAE
209 PALM DR
FORT MORGAN CO 80701
504-15-425

HIPPEN JOHANN H & ALICE M
4845 N ISLERO PL
TUCSON AZ 85715
504-14-039

HOEHN KENNETH R & GERALDINE E
2004 VOLKMAN ST
SCHOFIELD WI 54476
504-15-138

HOHENSTEIN LYNN M & JOHN E
632 FARBEN DR
DIAMOND BAR CA 91765
504-15-084

HOLCOMB ZELTUS & ORILE N
601 W 8TH ST
SPRINGFIELD CO 81073
504-15-475

HOLLAND & SEEGER GENERAL PARTNERSHIP
1550 E MISSOURI #306
PHOENIX AZ 85014
504-07-002A 504-07-002C

HOLLAND & SEEGER GENERAL PARTNERSHIP
2390 E CAMELBACK RD #330
PHOENIX AZ 85016
504-07-002D

HOLLAND EUGENE J
13884 PAS ALDABRA
SAN DIEGO CA 92129
504-15-061D

HOLLAND EUGENE J & PAMELA A
7121 N QUARTZ MTN RD
SCOTTSDALE AZ 85253
504-15-061C

HOLOUBEK STEVE R & POLLY S
7777 S WILLOW WAY
ENGLEWOOD CO 80112
504-15-390

HOOKS JOHN P & WANDA L
RT 1
PLATTVILLE WI 53818
504-15-174

HOOVER DALE D & LEONA F
136 MORTON
ASHLAND OR 97520
504-08-054 504-08-067

HOOVER L DWAIN & BEVA J & T D JONES ETAL
3312 E BERRIDGE LN
✓ PARADISE VALLEY AZ 85253
504-08-194

HOOVER VENICE I
C/O GARY HOOVER
12296 17TH ST
YUCAPIA CA 92399
504-08-038 504-08-053 504-08-068 504-08-081 504-08-082 504-08-097

HOSTETLER XEREPHA V
% MARLENE CROSBY
220 CACTUS HILL DR
GUNNISON CO 81230
504-15-459

HOUGHTON ARTHUR & VINETTA
RT 4 BOX 182
WHITEWATER WI 53190
504-15-089

HOWARD LIONEL R OR VIRGINIA C
P O BOX 587
TONOPAH AZ 85354
504-08-175

HUDACK RANCH LTD PARTNERSHIP
% FRANCES BOYER
4110 E JANICE WAY
PHOENIX AZ 85032
504-15-397

HUDSPETH GLEN C & SARA E
2975 GLENCOE ST
DENVER CO 80207
504-15-370

HUEBNER ROBERT W & DARLENE A
N6521 CTY AI
JUNEAU WI 53039
504-15-080

HUESKE V BEVERLY & B F
1818 OCEAN DR
MCKINLEYVILLE CA 95521
504-15-432

HULL GERALD & AMIE
RT 2 BOX 406
BUCKEYE AZ 85326
504-15-567

HULL SHERMAN A & OLAINA
RT 2 BOX 414
BUCKEYE AZ 85326
504-16-043G

HULL WILLIAM S & VIRGINIA I
FLANERY CHARLES R & CONNIE R
RT 2 BOX 408
BUCKEYE AZ 85326
504-15-027L

HULL WILLIAM S & VIRGINIA I
RT 2 BOX 412
BUCKEYE AZ 85326
504-16-043F

HULSIZER GEORGE E & BEVERLY S
12061 WESKEN LN
CINCINNATI OH 45241
504-15-088

HUNTER HALLEEN L
12607 BROOKLAKE AVE
LOS ANGELES CA 90066
504-08-163 504-08-164 504-08-180 504-08-181

HUNTER LEON & LILLIE MAE
109 PERIDOT COURT
HERCULES CA 94547
504-04-001D

I-10 FREEWAY PARTNERSHIP
% VINSION REALTY INC
949 E GUADALUPE
TEMPE AZ 85283
504-15-029H

JACOBSON ALBERT & FLORENCE
544 S 16TH ST
WEST BEND WISC 53095
504-08-139

JAHR IAN S & INA MAE
% INA MAE STROHBEEN
RT 2 BOX 153A
NEW RICHMOND WI 54017
504-15-192

JAMES LEON M & EVELYN Y
10387 YATES COURT
WESTMINSTER CO 80030
504-15-336

JEA COMPANY INC
% VINSON REALTY INC
P O BOX 9156
PHOENIX AZ 85068
504-15-029F 504-15-029G

JENKINS CLARK C
615 S ELDORADO RD
MESA AZ 85201
504-15-045

JENSEN EVERETT F & VYOLA
R #4 BOX 96
SHAWAND WI 54166
504-15-133

JETT CLIFFORD W/JULIA R
1667 W 28TH ST
SAFFORD AZ 85546
504-15-228

JOHNSON HUBERT A & ELIZABETH A
2850 EAGLE RD
WISCONSIN RAPIDS WI 54494
504-15-126

JOHNSON R EDESEL & SHIRLEY M
328 N 3RD ST
NEW RICHMOND WI 54017
504-15-210

JOHNSON S D
%LILLIAN BUNKERS
11650 GRATON RD
SEBASTOPAL CA 95472
504-15-020

JONES BETTY L
% BETTY L CANADA
P O BOX 184
WHITE BLUFF TN 37187
504-08-002F

JONES CHARLES G & RUTH
2819 W MONTEROSA ST
PHOENIX AZ 85017
504-16-044

JONES NORMAN HARRY & DOROTHY
RT 2 BOX 420 PALO VERDE RD
BUCKEYE AZ 85326
504-15-036B

JORDAN JOHN M & NINA M
RT 2 BOX 422
BUCKEYE AZ 85326
504-15-036A

JUMPER CARL D & MELLANESE
12954 ELGIN DR
DENVER CO 80239
504-15-369

JUNG ELSIE F
324 W PLYMOUTH
JEFFERSON WI 53549
504-15-087

KACER EDWARD I & DOROTHY B
P O BOX 107
PALO VERDE AZ 85343
504-15-032B 504-15-032C

KEJR FRANK G & HELEN D
BOX 262
WOODROW CO 80757
504-15-434

KESWICK STANLEY A & ROSE L
RT 2 BOX 423
BUCKEYE AZ 85326
504-15-040

KINZER E JOSEPH & HELEN B
123 N ESTERLY AVE
WHITEWATER WI 53190
504-15-086

KLEIN HARVEY M
7878 GAINNEY RANCH RD #7
SCOTTSDALE AZ 85258
504-15-586

KNAUF BERNARD C & ANNE M
1503 MCINDOR CT
WANSAN WI 54401
504-14-006

KNIGHT FRANK E & SHIRLEY J
P O BOX 5058
BISBEE AZ 85603
504-15-042

KOENIG ERWIN W & MABEL M
1166 BIRCH HILL LN
SHAWANO WI 54166
504-15-466

KWAITKOWSKI LOUISE L & HELEN J
1821 STRAND LN
MOSINEE WI 54455
504-15-119

L-L-H BUCKEYE AIRPORT PARTNERSHIP
2111 E HIGHLAND SUITE 150
PHOENIX AZ 85016
504-15-015G

LANDSCHNIEDER GERTRUDE
5530 W ROMA
PHOENIX AZ 85031
504-08-002R

LANE RAY F
1725 E VERDE LN
PHOENIX AZ 85016
504-08-002G

LANGE EDWARD L & IRMA H
308 14TH ST
BARABOO WI 53913
504-15-236

LARSON PATRICIA A
12613 N 51ST DR
GLENDALE AZ 85304
504-08-062

LATHROP MARGUERITE
P O BOX 1032
MONTROSE CO 81401
504-15-435 504-15-436 504-15-437

LEATHERS MABEL W
2101 E 37TH AVE
DENVER CO 80205
504-15-339 504-15-340

LEE A C
444 N WINDSOR AVE
BRIGHTWATERS NY 11718
504-08-125

LEE MARVEL A & MARGARET B
RT 1
COLUMBUS WI 53925
504-15-218

LEEMAN MONROE H & VEROICA J
BOX 71
CHANNING MI 49815
504-14-034 504-14-035

LEGG HENRY F & MARY L
P O BOX 801
BUCKEYE AZ 85326
504-08-170 504-08-178

LEGG JAMES B
P O BOX 273
BUCKEYE AZ 85326
504-08-150 504-08-153 504-08-165 504-08-166

LEGG KENNETH J
P O BOX 273
BUCKEYE AZ 85326
504-08-154

LEGG PERCY
P O BOX 273
BUCKEYE AZ 85326
504-08-149

LEONARD CLYDE E JR & CHRIS C
4041 CLINTON
DES MOINES IA 50310
504-15-167

LEVYN ROBERT J & LOUISE L
9500 KIRKSIDE RD
LOS ANGELES CA 90035
504-08-185 504-08-186 504-08-187 504-08-190

LEWIS CECIL J & CLEASTA L
825 KRAMERIA ST
DENVER CO 80220
504-15-423 504-15-429 504-15-430

LIND WILLIAM E & JOAN E
2715 TEMPLETON GAP RD
COLORADO SPRINGS CO 80907
504-15-398

LOFTIN MARK C ✓
352 E EL CAMINO
PHOENIX AZ 85021
504-08-169

LOOMIS RICHARD D
2020 PROSPECT ST
LA CROSSE WI 54603
504-15-191

LUCAS BEATRICE A
19559 MERRIMEN RD
LIVONIA MI 48152
504-08-188 504-08-189

LUCAS RALPH A
715 S 2ND ST
AVONDALE AZ 85323
504-15-578

LUKE LAND SIX
7801 N BLACK CANYON HWY
PHOENIX AZ 85021
504-15-026B

LUNSMANN CHARLOTTE ANN
% CHARLOTTE A RIGGS
P O BOX 546
ARIZONA CITY AZ 85223
504-15-243

M-W-M BUCKEYE AIRPORT PARTNERSHIP
2111 E HIGHLAND SUITE 150
PHOENIX AZ 85016
504-15-017C

MADRIGAL POLI
635 E DEE ST
AVONDALE AZ 85323
504-08-156

MAGNAN HAROLD E JR & JEROME M & JAMES M
410 MAIN ST
WATERTOWN WI 53094
504-15-114

MAHAFFEY & CO
13943 W 58TH PL
ARVADA CO 80004
504-15-378

MAHER MALIAD S & MARY C ETAL
7220 W COLUMBINE DR
PEORIA AZ 85345
504-15-032R

MAHNKE MARTIN R & GEORGE WAFLE
1009 E STATE ST
MAUSTON WI 53948
504-15-104

MARCHITTI NICK & CONNIE ETAL
3090 W CLYDE PL
DENVER CO 80211
504-15-360

MARTINEZ GEORGE E
870 E DECATUR ST
DENVER CO 80219
504-15-356

MASON CURITS E & GOLDIE A
RT 2 BOX 327
BUCKEYE AZ 85326
504-15-056D

MATTINGLY FRANKIE
214 LA CANADA BLVD
GOODYEAR AZ 85338
504-15-032D

MAYR JOSEPH H SR & DOLORES M
W 12395 HWY 16 & 60
COLUMBUS WI 53925
504-15-178

MCCORMICK WILLIAM A & BERNADINE G
5914 E BILLINGS
MESA AZ 85205
504-14-053

MCFATRIDGE ENICE E
808 WALKER CIRCLE
WHITEWRIGHT TX 75491
504-08-112

MCGINNIS TERRY S & TERISA LYNN
29202 W POLK
BUCKEYE AZ 85326
504-15-035A

MCKINLEY GEORGE A & KAREN B
1706 TIMBERWAY DR
RICHARDSON TX 75081
504-14-060

MCKINNEY DANIEL O & DELLA A
1132 N 191 AVE
BUCKEYE AZ 85326
504-15-027Z 504-15-041M 504-15-047D 504-15-061B 504-15-574E

MCKINNEY PAUL E & DIANE L
4115 E PALM LN
PHOENIX AZ 85008
504-15-585

MCMANUS NORRIS R & CAROLINE M
517 N 299TH AVE
BUCKEYE AZ 85326
504-15-584

MEIS WILLIAM F & JOSEPHINE A
OLD HWY C-D 1494
STRATFORD WI 54484
504-15-199

MELVIN FRANKLIN E & JOAN N
4746 W ROSEWOOD DR
GLENDALE AZ 85304
504-16-031

MEREDITH DANIEL T
2536 N 3RD ST
PHOENIX AZ 85004
504-15-415

MERTEN JOHN R & KATHLEEN E
30 MADRID WAY
HOT SPRINGS VILLAGE AR 71909
504-15-189

MILLER AMPARO A
5245 W CROCUS
GLENDALE AZ 85306
504-08-091

MILLER DEWEY L & TENA A
1112 S 1ST ST
MONTROSE CO 81401
504-15-372

MILLER FORREST L & LOIS A
13411 N 16TH AVE
PHOENIX AZ 85029
504-08-079

MILLER JAMES L & MARJORIE A
RTE 3
NEW RICHMOND WI 54017
504-15-202

MINISTER JOE CLAIRE J & ANNABELLE WALKER
4546 LOWELL BLVD
DENVER CO 80211
504-15-344

MINNESOTA TITLE CO
LLOYD J KNOTT PARTNERSHIP
HOUSE 19395 ROAD 46
CHEYENNE WELLS CO 80810
504-15-476

MINNESOTA TITLE CO TR 894
3003 N CENTRAL AVE
PHOENIX AZ 85012
504-14-007 504-14-015 504-14-047 504-15-091 504-15-129

MOERS DAVID R
% ELLEN JAMPOL
31 FIRST AVE
MONTPELIER VT 05602
504-08-028

MOERS DAVID R
31 FIRST AVE
MONTPELIER VT 05602
504-08-018 504-08-089

MOODY JOSEPH E & BARBARA J
11534 E CENTER DR
AURORA CO 80012
504-15-547

MOON FRANCES B
205 S FORREST DR
KOKOMO IN 46901
504-14-002A

MOORE CARL WAYNE & BRENDA KAY
RR 2 BOX 510
BUCKEYE AZ 85326
504-15-051C

MOUNTAIN PLAINS PROD CREDIT ASSN
P O BOX 1637 417 W MT AVE
FORT COLLINS CO 80522
504-15-362

MROTEK DUANE N & HELEN L
RTE 1
HAYWARD WI 54843
504-15-201

MUENCH CLAYTON C & SEVERA
N4561 HWY 45
ANTIGO WI 54409
504-14-011

MULLER DONALD LEE & ROMA A
1490 S VALENTINE WAY
LAKEWOOD CO 80228
504-15-506

MURRAY JAMES L & GLADYS
2400 ASHTON PL
MESA AZ 85205
504-08-134

MURRILLO AURELIO
RT 2 BOX 550
BUCKEYE AZ 85326
504-15-035D

MYSCOFSKI BERNARD F & JUDITH R
RT 2 BOX 475
BUCKEYE AZ 85326
504-15-062

NARANJA ROGELIO D & IMELDA T
BOX 476
JAMESTOWN ND 58401
504-15-028B

NELSON-ROMAN BUCKEYE AIRPORT PARTNERSHIP
2111 E HIGHLAND SUITE 150
PHOENIX AZ 85016
504-15-016

NICHOLS HARRY R & ROSE C
C/O WOODROW J FARRAR
15023 N 25TH PL
PHOENIX AZ 85032
504-08-106

NIELSEN VERN DEE & BEVERLY
12215 E CHANDLER HEIGHTS
CHANDLER AZ 85429
504-15-059

NITZEL LEONARD H & DOROTHY M
% DOROTHY M SAMPSON
1408 BROSS ST
LONGMONT CO 80501
504-15-462

NOLL HENRY & BERNADETTE
909 S LINCOLN AVE
BEAVER DAM WI 53916
504-15-110

NORTHWEST BUCKEYE WATER CO INC
4520 N CENTRAL AVE #500
PHOENIX AZ 85012
504-15-318

NORTHWEST BUCKEYE WATER CO INC
4250 N CENTRAL AVE #154K
PHOENIX AZ 85018
504-15-313

NOWOTNY WILLIAM W & HARRIET A
910 RIDGE DR
CORTEZ CO 81321
504-15-486

NUSTAD SIDNEY J & OLIVE M
304 CHASE ST #1
VIROQUA WI 54665
504-15-179

OLDHAM RICHARD L & DONNA R
BIRMINGHAM JAMES J
1801 I PARKCOURT PL #101
SANTA ANA CA 92701
504-07-003A

OLIVER DAVID ROBERT
RT 2 BOX 423
BUCKEYE AZ 85326
504-15-041B

ORONA PETE T
RT 2 BOX 401
BUCKEYE AZ 85326
504-15-577

OZANNE KEITH E & MARIE T
243 LAMAR BLVD
GOODYEAR AZ 85338
504-08-027 504-08-046

PALO VERDE 150 JOINT VENTURE
2308 E JACARANDA
MESA AZ 85203
504-04-001C

PALO VERDE 2 PARTNERSHIP
2390 E CAMELBACK #100
PHOENIX AZ 85016
504-15-049B

PALO VERDE ROAD 120 LTD
736 W THUNDERBIRD
PHOENIX AZ 85023
504-04-005E 504-04-007C

PAPKE JOSEPHINE
7257 E VERNON
SCOTTSDALE AZ 85257
504-08-041

PAQUETTE JACK L & MAXINE L
439 E ST
SALIDA CO 81201
504-15-384

PARKER ERNEST R & MARY NATALIE
RT 2 BOX 953
BUCKEYE AZ 85326
504-14-136

PARKER SOUTH LIMITED PARTNERSHIP
726 MONROE
BUCKEYE AZ 85326
504-08-111

PARR LEROY E & BETTY M
R2 BOX 389
RICHLAND CENTER WI 53581
504-15-069

PATEANDREW J & VIOLA G
7131 N BROOMTAIL DR
TUCSON AZ 85743
504-08-140

PATTERSON GORDON M & HELEN G
127 CAPTIVA
NOKOMIS FL 34275
504-15-193

PATTON HUBERT B
6002 N 61ST AVE
GLENDALE AZ 85301
504-08-002J 504-08-039 504-08-040 504-08-051 504-08-072 504-08-077 504-08-118
504-08-123

PATTON THELMA JANE
6002 N 61ST AVE
GLENDALE AZ 85301
504-08-029 504-08-030 504-08-031 504-08-086

PETERS ROGER A & VIRGINIA L
54099 BRAMSCHRIEBER RD
LITTLE SUAMICO WI 54141
504-15-149

PETERSEN MICHAEL AUGUST
2604 19TH ST
COLUMBUS NE 68601
504-15-330

PETERSON ROBERT W & LATTIMER H FORD TR
3326 N 3RD AVE
PHOENIX AZ 85013
504-03-014 504-03-015

PHILLIPS CHARLES H & CAPTOLA L
RT 1 BOX 323
LAS ANIMAS CO 81054
504-15-513

PHOENIX WEST VALLEY I
21515 HAWTHORNE BLVD #500
TORRANCE CA 90503
504-03-012

PILLER RAYMOND D
216 N 7TH ST
MEDFORD WI 54451
504-15-145

PINTER JOHN L & JANET J ETAL
RTE 1 BOX 132
DORCHESTER WI 54425
504-15-240

PITNER JOSEPH A JR & PATRICIA L
640 SPRINGHILL COURT
HURST TX 76054
504-14-069

POGUE ROBERT P & THELMA F
4113 S 6TH ST
PHOENIX AZ 85013
504-15-590

POLANSKY WILLIAM O & ELSIE
RT 2 BOX 595
SIREN WI 54872
504-15-125

POLZELLA JEAN ANN
515 SILVER BEACH AVE APT 2
DAYTONA BEACH FL 32018
504-08-117 504-08-124

PONGRATZ RAYMOND A & JANE B
6284 HWY 186 SOUTH
VESPER WI 54489
504-15-194

POST JASON & JOSHUA ETAL
3101 HOSETTE RD
SAN JOSE CA 95152
504-08-128

POWALISH GARY S & HARRY M
7106 SKYVIEW TRAIL
ROSCOE IL 61073
504-15-166

PRARIZZI JOHN B & MARIE E
RT 1 BOX 329
HURLEY WI 54534
504-14-024

PRATT MARTHA L
20 MAROON PLACE
CARBORDALE CO 81623
504-15-444

PRELOZNI HENRY P
768 N 24TH ST
LACROSSE WI 54601
504-15-186

PRISELAC FRANK W & ANITA T
3535 HUMBOLT ST
DENVER CO 80205
504-15-351

PRISELAC FRANK W & JOSEPH E
3535 HUMBOLT ST
DENVER CO 80205
504-15-357 504-15-358

PRUDENT INVESTMENT OPPORTUNITIES INC
% ALEXANDER PAUL JR
10 SETTLERS HILL RD
DANBURY CT 06811
504-15-382 504-15-386 504-15-405 504-15-409 504-15-433

PRUITT JAMES EVERETT & AILENE L
RT 2 BOX 608
BUCKEYE AZ 85326
504-15-576

PURK BUCKEYE AIRPORT
2111 E HIGHLAND SUITE 150
PHOENIX AZ 85016
504-15-019B

PVM10 INVESTMENTS
4520 N CENTRAL # 500
PHOENIX AZ 85012
504-15-053 504-15-054

RADITZ MILTON & DORIS ETAL
BOX 388
SILVER LAKE WI 53170
504-15-217

RAGSDALE LINCOLN J ETAL
1100 E JEFFERSON ST
PHOENIX AZ 85034
504-04-001F

RAMIREZ MILISA G
2844 W VERMONT
PHOENIX AZ 85017
504-08-179

RAMSEY HAROLD L & VERONICA
6609 W SIERRA ST
GLENDALE AZ 85304
504-15-044

REICHEL CHARLES E
1097 MT ALTO RD
ROME GA 30161
504-15-198

REICHEL DANIEL J
714 S LAFAYETTE ST
SHAWANO WI 54166
504-15-467

REITZ RICHARD & LUCILLE I
4692 N FISHER
FRESNO CA 93726
504-15-570

RHOTON IVAN L
1019 E REDONDO DR
TEMPE AZ 85282
504-08-047

RICE HARVEY K & ODESSA N
RT 2 BOX 664
BUCKEYE AZ 85326
504-15-583

RICHARDSON ARLO W
P O BOX 493
PHOENIX AZ 85001
504-08-107

RICO MARTIN C & HELEN M
RT 2 BOX 400
BUCKEYE AZ 85326
504-15-565

RICO NIEVES C & HORTENSIA
RT 3 22403 W HAMMOND DR
BUCKEYE AZ 85326
504-15-027H

RILEY FRED M & CAROL J
3587 S QUEBEC
DENVER CO 80327
504-15-469 504-15-473

RITGER ROMAN G & ELAINE E
654 2ND AVE
WEST BEND WI 53095
504-15-066

RMN PARTNERS
5060 N 40TH ST STE 214
PHOENIX AZ 85018
504-04-013A 504-04-013B 504-73-005 504-73-006 504-73-007

ROBERTS ANITA
4127 N 5TH AVE
PHOENIX AZ 85013
504-15-025A

ROBERTS JOSEPH A & JEAN C
6835 E DALE LANE
CAVE CREEK AZ 85331
504-08-043 504-08-048

RODRIGUEZ ROBERTO P
19423 N 9TH PLACE
PHOENIX AZ 85024
504-15-050A

ROTH RONALD E & HELEN R
RT 2 BOX 264
MEDFORD WI 54451
504-15-238

ROUSH GERALD RAYMOND & VIRGINIA ELAINE
P O BOX 73
DILLON CO 80435
504-15-561

ROUSH RICHARD ARLEN & LAURA IVENA
7416 PAUL PL
LOVELAND CO 80537
504-15-563

ROUSH ROBERT RONALD & JERRILYN KAY
4297 S 900 E
OGDEN UT 84403
504-15-562

ROUSH SHELDON RILEY & LINDA JEAN
1833 11 RD
LOMA CO 81524
504-15-560

RUESCH LE ROY E & LENORE A TR
5641 QUIST DR
PORT RICHEY FL 34653
504-15-121

RUTHERFORD JUNIOR MONTY & LORENE T
115 IRWIN ST
GUNNISON CO 81230
504-15-450 504-15-451

SALAZAR JESUS M & ENEDINA R
201 E KINDERMAN
AVONDALE AZ 85323
504-15-587

SALFISBERG BARBARA J
1165 S HONEY WAY
DENVER CO 80224
504-15-326

SALIBA DAVID G & SIHAM A
3923 W GRIESS DR
PHOENIX AZ 85023
504-15-572

SCHAFFER PLUS J & MARY EAN
210 3RD AVE EAST
ASHLAND WI 54806
504-15-130

SCHEIDENLEIN JOSEPH A & BARBARA J
% FARMERS HOME ADMINISTRATION
P O BOX 1446
BUCKEYE AZ 85326
504-15-050B

SCHILLING MARVIN L & ANGELA A
916 WALNUT ST
MARATHON WI 54448
504-15-160

SCHIRM RONALD L & DAVID E MARINE
7313 E LATHAM
SCOTTSDALE AZ 85257
504-08-135 504-08-191

SCHLEEF WALTER F & OLGA E
R 1 BOX 181
WISCONSIN DELLS WI 53965
504-15-221

SCHMIT JOHN P & VIOLA M
521 E SOMO AVE
TOMAHAWK WI 54487
504-15-205 504-15-206

SCHRADER ELIZABETH M
1414 7TH AVE
ANTIGO WI 54409
504-14-031

SCHURZ LAURENCE J & CLARIS E
RT 1
REWEY WI 53580
504-15-093

SCHWARTZ ARDEN & ETHEL M
4408 HWY 52
WAUSAU WI 54401
504-15-144

SCOTT BERNARD F & LAVONNE J ETAL
BOX D
FRIENDSHIP WI 53934
504-15-235

SCOVILLE DIANE & ELSIE GRUBB
11351 SE BLACK RD
OLALLARCH WA 98359
504-08-008

SEARS ERANEE B
RT 2 BOX 410
BUCKEYE AZ 85326
504-16-043E

SECURITY TITLE AGENCY TR5652
2810 W CAMELBACK
PHOENIX AZ 85017
504-15-001B 504-15-002D

SEEHORN WILLIAM L
3841 W PURDUE
PHOENIX AZ 85021
504-16-050

SEFFERT GEORGE & HELGA
WILHELMSTR 7
6968 WALLDUERN
WEST GERMANY
504-15-327

SEIBOLT BUCKEYE AIRPORT LTD PARTNERSHIP
2111 E HIGHLAND SUITE 150
PHOENIX AZ 85016
504-15-015E

SENA ELOYD & RUTH L
521 UVALA ST
AURORA CO 80011
504-15-543

SERGEANT ARMOND C ETAL
410 COLLEGE AVE EAST
LADYSMITH WI 54848
504-15-163

SERVAIS ALOIS L & MARY J
3450 LINBRIDGE CT
LA CROSSE WI 54601
504-15-100

SHAWVER JOHN H & WANDA W
4434 N 60TH AVE
PHOENIX AZ 85034
504-08-017

SHEMER JACK E TR
5230 E SHANGRI LA
SCOTTSDALE AZ 85254
504-08-003

SHEPARD RAYMOND & CLARA B
1037¹/₂ N PECOS ST
DENVER CO 80221
504-15-332

SHOECRAFT MAYO A L
7739 W SHANGRI LA RD
PEORIA AZ 85345
504-04-006F

SIGAL PROPERTIES INC
HERON FINANCIAL CORP
510 W 6TH ST #917
LOS ANGELES CA 90014
504-03-013 504-06-004

SILVERMAN RAYMOND & LENORE R
5001 N SCOTTSDALE RD
SCOTTSDALE AZ 85253
504-08-121

SIMON HENRY S
W 1384 1ST AVE
GLEASON WI 54435
504-14-033

SMARSLIK JOHN W & MARY K
RT 5 BOX 756
LAKE GENEVA WI 53147
504-15-105

SMITH COLMAN V & JOYCE L
P O BOX 655
BUCKEYE AZ 85326
504-15-580

SMITH JERRY G & DEBORAH S
29633 W ROOSEVELT
BUCKEYE AZ 85326
504-15-575E

SMITH JOHN H & NORMA J
RR 1 BOX 239
SPRINGFIELD IL 62707
504-08-104

SMITH LOUIS S JR & MARYLAND J
RT 2 BOX 604
BUCKEYE AZ 85326
504-15-032L

SMITH WANDA ETAL
5508 N MARION WAY
PHOENIX AZ 85018
504-08-131 504-08-132

SOKOLOWSKI WALTER L & THERODOSIA M ETAL
W 10427 HWY 8
LADYSMITH WI 54848
504-15-134 504-15-135 504-15-136

SOLIZ GUADALUPE & DOLORES
3023 N 39TH DR
PHOENIX AZ 85019
504-15-575F

SPENCER DONALD D
3425 S SHERMAN #413
ENGLEWOOD CO 80110
504-15-323 504-15-342

STANCATI FRANK & ADELINE
905 H ST
SALIDA CO 81201
504-15-410

STAPLETON BERNARD N & MARJORIE I
62821 HWY 90
MONTROSE CO 81401
504-15-457

STARDUST INVESTMENTS INC
% J BISGROVE
425 EAGLE ROCK AVE
ROSELAND NJ 07068
504-06-005 504-16-007A 504-16-007B 504-16-007C 504-16-008A 504-16-008B 504-15-008C
504-16-011 504-16-016C 504-16-016D 504-16-016E 504-16-016G 504-16-021D 504-16-022

STENNER RAYMOND D & MARCELLA G
5212 US HWY 18
FENNIMORE WI 53809
504-15-445

STEVENS AGNES
1875 E BERNICE DR
CHINO VALLEY AZ 86323
504-08-002N

STEWART RUSSELL C & HAZLE I
23948 CAMP RD
SIREN WI 54872
504-15-212

STEWART TITLE & TRUST
MADERO JUAN M & ELISA S
5709 S 21ST AVE
PHOENIX AZ 85014
504-08-172

STEWART TITLE & TRUST OF PHOENIX TR
WILSON STEVE E & CONSTANCE L
3016 N 37TH DR
PHOENIX AZ 85019
504-08-058 504-08-063

STODOLA JOHN & MARCIA C
105 EASTBANK COURT NORTH
HUDSON WI 54016
504-14-067

STONE GLEN G
6731 BROOK FORREST DR
EVERGREEN CO 80439
504-15-321

STROESSNER WAYNE
W 7708 HWY B
BROWNTOWN WI 53522
504-15-231

SUN VALLEY 560 PARTNERSHIP
2111 E HIGHLAND STE 150
PHOENIX AZ 85016
504-03-008 504-03-009

SUN VALLEY DEVELOPMENT COMPANY
4520 N CENTRAL #500
PHOENIX AZ 85012
504-15-569D 504-15-592 504-16-013C 504-16-019L 504-16-019M 504-16-024A 504-16-024B
504-16-024C 504-16-025B 504-16-026 504-16-030 504-16-032 504-16-033 504-16-035
504-16-036 504-16-037 504-16-039B 504-16-039C 504-16-046 504-16-049 504-72-016L
504-72-016M 504-72-017B 504-72-017C 504-04-015 504-07-001

SUN VALLEY II LTD PARTNERSHIP
2255 N 44TH #330
PHOENIX AZ 85008
504-04-012A

SUN VALLEY OWNERS ASSOCIATION
4520 N CENTRAL #500
PHOENIX AZ 85012
504-04-012B

SWEET MALCOLM S & MILDRED W
7653 LEE DR
ARVADA CO 80002
504-15-489

TAUTIMER GILBERT & DELORES
RT 2 BOX 477
BUCKEYE AZ 85326
504-15-063A

TEMPE LEASING & RENTAL CO
STAR RT 1 BOX 714
BUCKEYE AZ 85326
504-08-019 504-08-020 504-08-021 504-08-022 504-08-023 504-08-042 504-08-044
504-08-049 504-08-052 504-08-055 504-08-056 504-08-065 504-08-070 504-08-071
504-08-073 504-08-078 504-08-080 504-08-083 504-08-087 504-08-096 504-08-108
504-08-113 504-15-049C

TERRONES SERAPIO V & LUCY D TR
P O BOX 11
EL MIRAGE AZ 85335
504-08-002M

THEDFORD PHILAN A & EVA G
P O BOX 637
BUCKEYE AZ 85326
504-15-064C

THOMAS ROBERT H & ANN A
1161 SUNFIELD ST
SUN PRAIRIE WI 53590
504-14-044

THOMAS TIMOTHY & WANDA
434 JACKSON ST
WATERLOO WI 53594
504-14-043

THOMPSON BERNARD E & MAE P
980 PRINCESS CT
PLATTEVILLE WI 53818
504-15-172

THORNTON NORMAN G & IRENE L
1540 BILLINGS ST D-8
AURORA CO 80011
504-15-419

339TH AVE & FREEWAY INV GROUP
300 W OSBORN RD SUITE 100
PHOENIX AZ 85013
504-08-195

THUNE STEPHEN & MARY JUNE ETAL
5525 E MICHELE
SCOTTSDALE AZ 85254
504-15-043

TIMPTE CARROLL C & MARY R
707 IVANHOE WAY
GRAND JUNCTION CO 81506
504-15-379

TOLSMA WIEGER W & LOUISE J
10741 S 103RD RD
ALAMOSA CO 81101
504-15-484

TRASKA LOUIS A & MILDRED M
616 AUGUSTA AVE
WAUSAU WI 54401
504-15-132

TREADAWAY ANNE
RT 4 BOX 781A
PHOENIX AZ 85031
504-08-130

TREME LOLA E
10317 N 12TH AVE
PHOENIX AZ 85021
504-08-141

TRICE CONRAD
4025 S RICHFIELD ST
AURORA CO 80013
504-15-353

TROCHANOWSKI ANDREW J
10600 NOAKES RD
LA MESA CA 92041
504-08-093

TRUE G HERBERT & BETTY ANN
1717 E COLFAX
SOUTH BEND IN 46617
504-16-009

TRUJILLO JOHN G & LUCIA L
RT 2 BOX 470
BUCKEYE AZ 85326
504-15-064B

TSCHANZ HERMAN
RT 2 BOX 256K
MONTELLO WI 53949
504-14-056

TURZINSKI BEN J & THERESA M
RT 1 BOX 32
ALMOND WI 54909
504-15-152

TWEEDDALE ADELINE H
1739 S GRANT
DENVER CO 80210
504-15-395

UNDERWOOD JAMES D & DOROTHY A ETAL
% MARY WOODWARD
421 WINDSOR ST
SUN PRAIRIE WI 53590
504-15-090

UPTEGROVE BARBARA C
RT 2 BOX 432
BUCKEYE AZ 85326
504-15-057

UPTEGROVE SAMUEL EDWARD & MARY ANNETTE
RT 2 BOX 431
BUCKEYE AZ 85326
504-15-055 504-15-056B

UPTEGROVE SAMUEL M & BARBARA C
RT 2 BOX 432
BUCKEYE AZ 85326
504-15-058

VADER JOSEPH P & LEVON N
45958 HIGHWAY 50
GUNNISON CO 81230
504-15-347 504-15-497

VAN ACKEREN MARY C
7149 W HOOVER AVE
LITTLETON CO 80123
504-15-456

VAN SIPE RICHARD H & MARY E
7675 U S #1 S LOT 26
TITUSVILLE FL 32780
504-14-091

VEIGALE TERRY
RT 1 BOX 714
LAVEEN AZ 85339
504-08-076

VORWALD HARRY F & NORMA I
9562 MAQUOKETA DR
DUBUQUE IA 52001
504-15-460 504-15-461

VORWALD LINDA M
9852 W 22ND PL
LAKEWOOD CO 80215
504-15-465

W-K-A BUCKEYE AIRPORT PARTNERSHIP
2111 E HIGHLAND SUITE 150
PHOENIX AZ 85016
504-15-017B

WALKWITZ JON J
4154 S QUINCE ST
DENVER CO 80237
504-15-345

WANNEMACHER EDITH K & JOAN M
415 N CHERRY ST
KENTON OH 43326
504-15-514

WASHATKO EUGENE & GERTRUDE ETAL
N 1765 CTH S
ANTIGO WI 54409
504-14-016

WATKINS-BECKE BUCKEYE AIRPORT LTD PARTNERSHIP
2111 E HIGHLAND SUITE 150
PHOENIX AZ 85016
504-15-019F

WATSON BARRY G & SANDRA J
BOX 145
VIOLA WI 54664
504-15-106

WEBER JAMES B
14901 N SCOTTSDALE RD #306
SCOTTSDALE AZ 85254
504-04-006E

WEISENBECK RICHARD R & THELMA M
RR 2 BOX 188
DURAND WI 54736
504-15-146

WELCH VINSON M & EVELYN O
2138 GUNNISON AVE
GRAND JCT CO 81501
504-15-412 504-15-413 504-15-478 504-15-479 504-15-558 504-15-559

WELCH WILEY L & WILMA FAY
RT 2 BOX 635
BUCKEYE AZ 85326
504-15-032Y

WERDIN MARY J
R 2 BOX 30
WHITEWATER WI 53190
504-15-094 504-15-095 504-15-241

WESTLAND 11 PARTNERS
RT 1 BOX 152
DELTA UT 84624
504-72-016N

WHITE DALLAS T & MARION V TR
4744 N 49TH DR
PHOENIX AZ 85013
504-14-001A

WHITE ELMER & NAOMA
9184 COUNTY 513 T RD
RAPID RIVER MI 49878
504-14-092

WHITE JOSEPH W & HELEN C
7042 N 23RD AVE
PHOENIX AZ 85051
504-08-090

WHITE TANK PARTNERS
4141 N SCOTTSDALE RD STE 130
SCOTTSDALE AZ 85251
504-73-004 504-73-008

WICKUS HARLAND G JR
4453 HONEYWOOD
JACKSON WI 53037
504-15-076

WILKINSON DENNIS L & CHERI
213 N DACOTAH
DODGEVILLE WI 53533
504-15-111

WILLIAMSONO J D & DOLLY
VIRGIL BARRY C & SUSAN K ETAL
2501 W MISSOURI SP 101
PHOENIX AZ 85017
504-15-581

WILMER MARK & GENEVIEVE
SECURITY BLDG 400
PHOENIX AZ 85004
504-15-018C

WINOKUR MARTIN D
4525 N 17TH AVE
PHOENIX AZ 85015
504-07-005

WOHOSKI WALTER & INGERBORG
5634 E DODGE
MESA AZ 85205
504-08-147

WOLFINGER HENRY W & CAROLINE
BOX E
BIRNAMWOOD WI 54414
504-14-010

WOODRUM BUCKEYE AIRPORT LTD PARTNERSHIP
2111 E HIGHLAND SUITE 150
PHOENIX AZ 85016
504-15-019A

WORDEN ALVIN E & BETTY JEAN
134 E 5TH ST
SALIDA CO 81201
504-15-411

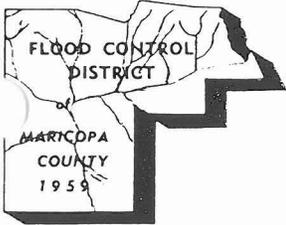
WORTH JON MICHAEL & JANICE FERN
1305 CATALINA AVE
SEAL BEACH CA 90740
504-16-020B

WRYCHA-SIKORSKI SANDRA L
2029 N HY Y
STEVENS POINT WI 54481
504-15-151

WYLLIE & ASSOC INC
3232 W STATE AVE
PHOENIX AZ 85051
504-15-593

YOUNG EDWARD M
5530 E ORCHID LN
PARADISE VALLEY AZ 85253
504-08-002E

ZAGRZEBSKI EDWIN R & ALICE T
2959 CHANNEL DR
STEVENS POINT WI 54481
504-15-116



FLOOD CONTROL DISTRICT
of
Maricopa County

3335 West Durango Street • Phoenix, Arizona 85009
Telephone (602) 262-1501

D. E. Sagramoso, P.E., Chief Engineer and General Manager

BOARD OF DIRECTORS

Betsey Bayless
James D. Bruner
Carole Carpenter
Tom Freestone
Ed Pastor

RECEIVED

SEPTEMBER 25 1991

SEP 26 1991

Mr. Chuck Neumayer
Vice President
Alpha Engineering Group, Inc.
2701 East Camelback Road, Suite 100
Phoenix, Arizona 85016-4306

ALPHA Engineering Group, Inc.

SUBJECT: Contract FCD 90-64, White Tanks Wash Flood Insurance Study

Dear Mr. Neumayer:

This letter will serve as confirmation of the September 16, 1991 verbal Notice To Proceed for the work under the above-referenced contract that was approved by the Board of Directors on September 16, 1991.

A fully executed contract is enclosed for your use. If you have any questions, please do not hesitate to contact Pedro Calza at 262-1501.

Sincerely,

Leanna Cumberland
Chief, Contracting Branch

Enclosure (1)

CONTRACT FOR CONSULTANT SERVICES

CONTRACT FCD 90-64

Pursuant to the provisions of the Arizona Revised Statutes (A.R.S.), 48-3603, the Board of Directors has the authority to enter into contracts.

The Flood Control District of Maricopa County, Arizona, hereinafter called the "DISTRICT", is desirous of having certain professional services performed in connection with the White Tanks Wash Flood Insurance Study, hereinafter called the "PROJECT" and as more fully described in Exhibit A, Scope of Work, attached, and

ALPHA ENGINEERING GROUP, INC., hereinafter called "CONSULTANT", is desirous of performing said services;

THEREFORE, the parties hereto mutually agree as follows:

SECTION I - SERVICES OF THE CONSULTANT

The CONSULTANT, under the general supervision of the Chief Hydrologist of the DISTRICT's Hydrology Division, shall prepare studies, reports, surveys, plans, drawings, specifications and cost estimates as are necessary for the PROJECT and according to the directions and designated standards of the DISTRICT and in accordance with Exhibit A. It is understood and agreed that the DISTRICT's authorized representative shall be the Chief Hydrologist or his duly authorized representative, hereinafter called the "AGENT" and that he/she shall be the sole contact for administering this contract.

The CONSULTANT shall meet periodically with the AGENT so as to keep the DISTRICT informed of the progress of the work in accordance with the schedule defined in Exhibit A.

The CONSULTANT shall promptly advise the AGENT of any factors, which may develop during the PROJECT, that would likely result in construction or design costs in excess of budgetary constraints.

SECTION II - PERIOD OF SERVICE

The CONSULTANT shall complete all work per the schedule provided in Exhibit A, Scope of Work within 300 calendar days after receipt of the Notice to Proceed, inclusive of DISTRICT review time. Should extension of this contract period be necessary, and any such extension(s) continue the date of contract expiration for a time period of more than one year from the date of contract execution, adjustment(s) of the consultant's fee(s) may, upon agreement by both the DISTRICT and the CONSULTANT, be made in accordance with the Consumer Price Index

for Urban Consumers, Western Division published by the U.S. Department of Labor, Bureau of Labor Statistics, using the published edition coinciding with the initial contract expiration date. Any such fee adjustment shall only apply to the extended contract time period.

SECTION III - PAYMENTS TO THE CONSULTANT

The CONSULTANT shall be paid for work under this Contract a lump sum fee of \$201,730.00 plus any adjustments that have been approved in writing in accordance with the Maricopa County Procurement Code.

The DISTRICT shall pay the CONSULTANT upon completion of the work as accepted by the DISTRICT, except that progress payments may be made as billed by the CONSULTANT based on approved monthly progress reports subject to the limitations set forth in Exhibit "A", Scope of Work. Ten percent of all contract payments made on an interim basis shall be retained by the DISTRICT as insurance of proper performance of the contract or, at the option of the CONSULTANT, a substitute security may be provided by the CONSULTANT in an authorized form pursuant to procedures established by the DISTRICT. The CONSULTANT is entitled to all interest from any such substitute security.

When the contract is fifty percent (50%) completed, one-half (1/2) of the amount retained will be paid to the CONSULTANT provided the CONSULTANT is making satisfactory progress on the contract and there is no specific cause or claim requiring a greater amount to be retained. After the contract is fifty percent (50%) completed, no more than five percent (5%) of the amount of any subsequent progress payments shall be retained providing the CONSULTANT is making satisfactory progress on the project, except if at any time the DISTRICT determines satisfactory progress is not being made, ten percent (10%) retention shall be reinstated for all progress payments made under the contract subsequent to the determination.

Any retention monies shall be paid or substitute security returned or released, as applicable, to the CONSULTANT within forty-five (45) calendar days after: (1) Completion of the work in Exhibit A through the submittal of District accepted/ approved documents to FEMA, (2) receipt of a completed "Certificate of Substantial Performance" form, (3) the CONSULTANT's statement that no project disputes exist; and (4) invoicing for any retained monies has been received by the DISTRICT. Upon acceptance and approval of the project by FEMA and the completion of all final work required by the DISTRICT, the CONSULTANT shall submit a final Certificate of Performance and its invoice for any sums remaining due and payable under this Contract.

If the CONSULTANT desires a partial payment in accordance with the provisions above, the CONSULTANT will complete and forward, a DISTRICT provided form, indicating payment distribution to MBE/WBE firms.

SECTION IV - THE DISTRICT'S RESPONSIBILITIES

The DISTRICT shall furnish the CONSULTANT, at no cost to the CONSULTANT, the following information or services for this PROJECT:

A. One copy of on-hand maps, records, survey ties, bench marks or other data pertinent to the PROJECT. This does not, however, relieve the CONSULTANT of the responsibility of searching records for additional information, for requesting specific information or for verification of that information provided. The DISTRICT does not warrant the accuracy or comprehensiveness of any such information.

B. All available information and data relative to policies, standards, criteria, and studies, etc. impacting the PROJECT as identified by the CONSULTANT.

C. Availability of staff for consultation with the CONSULTANT during the performance of studies and plan development in order to identify the problems, needs, and other functional aspects of the PROJECT.

D. Examination of documents submitted by the CONSULTANT and rendering of decisions pertaining thereto promptly, to avoid unreasonable delay in the progress of the work by the CONSULTANT. The DISTRICT will keep the CONSULTANT advised concerning the progress of the DISTRICT's review of work.

SECTION V - ALTERATION IN SCOPE OF WORK

Any alteration in the scope of work that will result in a substantial change in the nature of the PROJECT so as to materially increase or decrease the contract fee will require negotiation of an amendment to the contract to be executed by the DISTRICT and the CONSULTANT. No work shall commence on the change until the contract amendment has been approved by the DISTRICT and the CONSULTANT has been notified to proceed by the AGENT. It is distinctly understood and agreed that no claim for extra work done or materials furnished by the CONSULTANT will be allowed by the DISTRICT except as provided herein, nor shall the CONSULTANT do any work or furnish any materials not covered by this agreement unless such work is first authorized in writing in accordance with the Maricopa County Procurement Code. Any such work or materials furnished by the CONSULTANT without such written authorization first being given shall be at his own risk, cost, and expense, and he hereby agrees that without such written authorization he will make no claim for compensation for such work or materials furnished.

SECTION VI - RECORDS

Records of the CONSULTANT's payroll expense pertaining to this PROJECT and records of accounts between the DISTRICT and the CONSULTANT shall be kept on a generally recognized accounting basis and shall be available upon request to the DISTRICT or its authorized representative for audit during normal business hours. The records shall be subject to audit by appropriate grantor agency if the PROJECT is funded all or in part by a grant.

SECTION VII - PROJECT COMPLETION

If during the course of this contract situations arise which prevent completion within the allotted time, an extension may be granted by the AGENT.

SECTION VIII - TERMINATION

The DISTRICT may terminate this contract at any time upon reimbursement to the CONSULTANT of expenses which include reasonable charges for time and material for the percentage of work satisfactorily completed and turned over to the DISTRICT.

The DISTRICT reserves the right to postpone, terminate or abandon this PROJECT for the CONSULTANT's failure to complete the PROJECT on time, or failure to comply with the provisions of the contract. The DISTRICT also reserves the right to terminate any or all parts of this contract for its own convenience as the DISTRICT may determine at its sole discretion.

The DISTRICT hereby gives notice that pursuant to A.R.S. Section 38-511 "A" this contract may be cancelled without penalty or further obligation within three years after execution if any person significantly involved in initiation, negotiation, securing, drafting, or creating a contract on behalf of the DISTRICT is, at anytime while the contract or any extension of the contract is in effect, an employer, agent, or any other party to the contract in any capacity or a consultant to any other party of the contract with respect to the subject matter of the contract. Cancellation under this section shall be effective when written notice from the Chief Engineer and General Manager of the DISTRICT is received by all of the parties of the contract. In addition, the DISTRICT may recoup any fee for commission paid or due to any person significantly involved in initiation, negotiation, securing, drafting, or creating the contract on behalf of the DISTRICT from any other party to the contract arising as a result of the contract.

The CONSULTANT may terminate this contract in the event of nonpayment of fees as specified in Section III, PAYMENTS TO THE CONSULTANT.

SECTION IX - OWNERSHIP OF DOCUMENTS

All original documents including, but not limited to studies, reports, tracings, drawings, physical and computer models, estimates, field notes, investigations, design analyses, calculations, computer software, and specifications, prepared in the performance of this Contract are to be and remain the property of the DISTRICT and are to be delivered to the AGENT before final payment is made to the CONSULTANT. The DISTRICT reserves the right to reuse the documents as it sees fit. However, the DISTRICT will not reuse, alter, or modify these documents without noting such alterations, modifications, or intent of their reuse, and will hold the CONSULTANT harmless from any claims arising from the reuse, alteration, or modification of the documents. The CONSULTANT may retain reproducible copies of all such documents delivered to the DISTRICT.

The CONSULTANT hereby releases all Subcontractors/Subconsultants employed for this project from any liability or prior notice and authorization for providing information or copies of records requested by the DISTRICT subsequent to the completion of this Contract.

SECTION X - COMPLIANCE WITH LAWS

The CONSULTANT is required to comply with all Federal, State and local laws, local ordinances and regulations. The CONSULTANT's signature on this contract certifies compliance with the provisions of the I-9 requirements of the Immigration Reform and Control Act of 1986 for all personnel that the CONSULTANT and any subconsultants employ to complete this PROJECT. It is understood that the DISTRICT shall conduct itself in accordance with the provisions of the Maricopa County Procurement Code.

SECTION XI - GENERAL CONSIDERATIONS

A. Prior to beginning the work, the CONSULTANT shall furnish the DISTRICT for approval the names of its key employees, and of its sub-consultants and their key employees to be used on this PROJECT. Any subsequent changes are subject to the written approval of the DISTRICT.

The CONSULTANT in replacing a MBE/WBE subcontractor should attempt to contract with another MBE/WBE.

B. The CONSULTANT agrees during the execution of this contract that no clients other than the DISTRICT, or the Federal Emergency Management Agency, will be retained within the area of the 100-year floodplain for the area without expressed written authority from the chief Engineer and General Manager of the DISTRICT.

C. The failure of either party to enforce any of the provisions of this Contract or to require performance of the other party of any of the provisions hereof shall not be construed to be a waiver of such provisions, nor shall it affect the validity of this Contract or any part thereof, or the right of either party to thereafter enforce each and every provision.

D. The CONSULTANT shall be responsible for the cost of any additional design, field layout, testing, construction and supervision necessary to correct those errors or omissions attributable to the CONSULTANT and for any damage incurred by the DISTRICT as a result of additional construction costs caused by such CONSULTANT errors or omissions.

E. The fact that the DISTRICT has accepted or approved the CONSULTANT's work shall in no way relieve the CONSULTANT's responsibility.

F. It is mutually understood and agreed that this Contract shall be governed by the laws of the State of Arizona, both as to interpretation and performance. Any action at law, suit in equity, or judicial proceeding for the enforcement of this Contract, or any provision thereof, shall be instituted only in the courts of the State of Arizona.

SECTION XII - SUCCESSORS AND ASSIGNS

This Contract shall not be assigned by either party without prior written approval of the other except that the CONSULTANT may use in the performance of this Contract without prior approval of the DISTRICT, personnel or services of its related entities and affiliated companies as if they were an integral part of the CONSULTANT; and it shall extend to and be binding upon the heirs, executors, administrators, successors and assigns of the parties hereto.

SECTION XIII - NO KICK-BACK CERTIFICATION

The CONSULTANT warrants that no person has been employed or retained to solicit or secure this Contract upon any agreement or understanding for a commission, percentage, brokerage, or contingent fee; and that no member of the Board of Directors/Supervisors or any employee of the DISTRICT has any interest, financially or otherwise, in the CONSULTANT firm.

For breach or violation of this warranty, the DISTRICT shall have the right to annul this Contract without liability, or at its discretion to deduct from the Contract price or consideration, the full amount of such commission, percentage, brokerage, or contingent fee.

SECTION XIV - ANTI-DISCRIMINATION PROVISION

The Flood Control District of Maricopa County will endeavor to ensure in every way possible that minority and women-owned business enterprises shall have every opportunity to participate in providing professional services, purchased goods, and contractual services to the Flood Control District of Maricopa County without being discriminated against on the grounds of race, religion, sex, age, or national origin.

The CONSULTANT agrees not to discriminate against any employee or applicant for employment because of race, religion, color, sex, national origin, age, or handicap and further agrees not to engage in any unlawful employment practices. The CONSULTANT further agrees to insert the foregoing provisions in all subcontracts hereunder.

SECTION XV - AMENDMENTS

This Contract may be amended by mutual written agreement of the DISTRICT and the CONSULTANT.

SECTION XVI - INDEMNIFICATION AND INSURANCE

A. The CONSULTANT shall provide and maintain the following minimum insurance requirements:

1. Professional Liability. The CONSULTANT shall show evidence of maintaining continuous insurance for the past three (3) years with a minimum coverage limit of \$1,000,000.00 each claim and/or in the aggregate.

The CONSULTANT shall provide and maintain Professional Liability Insurance with a minimum single limit of \$1,000,000.00 for each claim made and an aggregate limit of \$1,000,000.00 for all claims made through this contract's completion date or the policy's life, whichever is longer.

2. Commercial General Liability. Commercial general liability insurance with a minimum single limit of \$1,000,000.00 for each coverage/occurrence. The policy shall include coverage for bodily injury and personal injury, broad form property damage and blanket contractual coverage.

3. Automobile Liability. Automobile liability insurance, with an individual single limit for bodily injury and property damage of no less than \$1,000,000.00, each occurrence, with respects to CONSULTANT's vehicles (whether owned, hired, non-owned), assigned to or used in the performance of this contract.

4. Workers' Compensation Insurance. This insurance shall be maintained during the life of the contract.

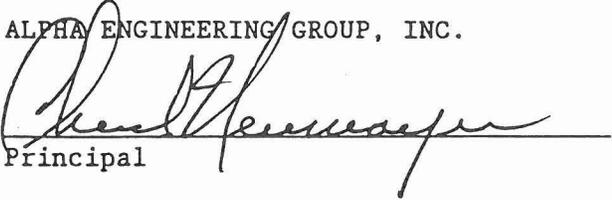
5. Additional Insured. The policies, except professional liability and workers' compensation, required by this section shall name the DISTRICT as Additional Insured, and shall specify that insurance afforded the CONSULTANT shall be primary insurance, and that any insurance coverage carried by the DISTRICT or its employees shall be excess coverage, and not contributory coverage to that provided by the CONSULTANT. No policy issued under this contract shall lapse, be cancelled, allowed to expire, or be materially changed to affect the coverage available to the DISTRICT without thirty (30) days written notice to the DISTRICT.

6. DISTRICT approved documentation outlining the coverages specified in this section shall be filed with the DISTRICT prior to issuance of the Notice to Proceed.

B. The CONSULTANT agrees to indemnify and save harmless the DISTRICT, any of its departments, agencies, officers, or employees from all suits, including attorney's fees and costs of litigation, actions, loss, damage, expense, cost or claims, of any character or any nature arising out of the CONSULTANT's wanton, willful or negligent acts, errors or omissions in the performance of work under this Contract, and any wanton, willful or negligent acts, errors or omissions by any subconsultant or other agent used by the CONSULTANT in the performance of work under this Contract.

IN WITNESS WHEREOF, the parties herein have executed this Contract.

ALPHA ENGINEERING GROUP, INC.


Principal

CHUCK NEUMAYER
Printed Name

VICE PRESIDENT, PRINCIPAL
Title

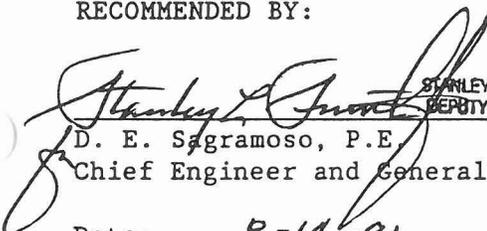
Date: AUGUST 9, 1991

91-1174557
Federal Tax Identification Number

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY:

ACCEPTED AND APPROVED:


STANLEY L. SMITH JR., P.E.
DEPUTY CHIEF ENGINEER
D. E. Sagramoso, P.E.
Chief Engineer and General Manager


Chairman, Board of Directors

Date: 8-14-91

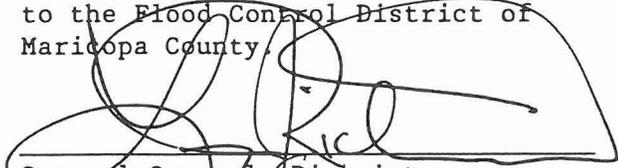
ATTEST:


Clerk of the Board

Date: 9-16-91

LEGAL REVIEW

Approved as to form and within the powers and authority granted under the laws of the State of Arizona to the Flood Control District of Maricopa County.


General Counsel, District

Date: 8-15-91

EXHIBIT A
Scope of Work
Flood Control District of Maricopa County
Topographic Mapping and Flood Insurance Study
White Tanks Wash and Tributary
Buckeye Structure No. 1 to Sun Valley Parkway

General

The project consists of topographic mapping and floodplain and floodway delineations of approximately 12 miles of White Tanks Wash and one tributary from Buckeye Structure No. 1 to the Sun Valley Parkway. The limits of the floodplain delineations will be determined after the completion of the preliminary hydrology. The Consultant will develop the hydrology using the Corps of Engineer's HEC-1 computer model and backwater analysis using the HEC-2 computer model to determine floodplain and floodway delineations for the 100 year peak flood. All work must be reviewed and accepted by the Federal Emergency Management Agency (FEMA) prior to the finalization of this contract. As a part of this requirement, the Contractor shall be responsible for Public Notification regarding this project. All work under this Scope will be completed within 300 calendar days from the date of the Notice to Proceed, including 60 days for Flood Control District reviews.

Task 1 Data Collection

- 1.1 The Consultant will collect and review pertinent data from the District and other outside sources. Data to be collected will include previous flood hazard reports and hydrology for the study area; existing topographic mapping; historical flooding information; as-built plans for existing structures; SCS stage/discharge curves for the Buckeye structures; FEMA Flood Hazard Boundary Maps and any Letters of Map Amendment and/or Revisions and other pertinent information.
- 1.2 Written summary of data collection will be submitted to the District for information purposes.
- 1.3 The Consultant will submit a project schedule showing coordination meetings and completion dates for each of the tasks in the contract.

Task 2 Topographic Mapping

- 2.1 The Consultant will notify all property owners and obtain any necessary Rights of Entry for the study area. The District will assist Consultant as may be necessary to complete this task.
- 2.2 An aerial survey subcontractor shall be retained by the firm as part of this contract. The Consultant shall coordinate all the aerial surveying work with the aerial surveying contractor to ensure that the specifications of the aerial surveying work is met. Quality control on surveys will be per FEMA 37, Flood Insurance Study Guidelines and Specifications for Study Contractors.

- 2.2.1 Prepare topographic mapping to a 4-foot contour interval, 1"=400' scale, with spot elevations on all improved section line and mid-section line roads.
- 2.2.2 Ground Control:
- a. The Consultant shall provide all survey control using 1983 NAD.
 - b. The Consultant shall systematically set panel points and establish horizontal and vertical control throughout the areas to be mapped for use in compilation by the aerial survey contractor. Where readily available, surveys will tie into the State Plane Coordinate System. Field control shall be sufficient to readily allow for compilation of maps by the aerial survey contractor at the desired map scale and contour interval and will be based on the National Geodetic Vertical Data (NGVD).
 - c. The horizontal and vertical control points shall be located and marked by the Contractor. The controls for the area mapping shall be in sufficient numbers and shall be in locations which will be compatible with the accuracy of the mapping requirements. The controls shall be of at least third order accuracy. Section corners, quarter corners, and mid-section points shall be used for control points wherever possible.
- 2.2.3 Digital contour and planimetric data developed for this project shall be delivered according to the attached document.
- 2.2.4 The Consultant shall provide permanent non-erasable topographic mylar sheets 24" x 36" with a scale of 1-inch equal to 400 feet, with a contour interval of 4 feet for all mapping. A cover sheet will be provided with the project title, date of topographic mapping, and a location map showing geographic range covered by each specific mapping sheet. Each manuscript shall include a minimum of a north arrow, scale, section corners and quarter corners, current and proposed streets and Highway names, State Plane Coordinate System, major drainage feature, corporate boundaries, cross section lines, channel station center line, index map, description and elevation of control points and ERMs, and reference marks used in ground control. The mapping will have an accuracy such that ninety percent (90%) of all contours shall be within one-half contour of the true elevations and the remaining ten percent (10%) of the contours shall not be in error by more than one contour interval.
- 2.2.5 The Consultant shall provide permanent non-erasable topographic mylars as described above in Section 2.2.4 with delineated flood plains included.
- 2.2.6 Sketch maps no larger than 11" x 17" for the study area must be included in the narrative report along with the flood profile maps.
- 2.2.7 Hydrologic Work Maps should be at a scale of 1 inch = 1200 feet and shall include: reproducible transparent overlay maps of existing

drainage patterns, subwatersheds; major flow paths; and general topographic maps.

Task 3 Hydrology

3.1 The hydrologic study of the watershed will be delivered to the District under separate cover from the hydraulic analysis. The hydrologic study area shall be the area bounded on the west by the Hassayampa River, on the north by Wagner Wash watershed, on the east by the White Tank Mountains, and on the south by the Buckeye Structures 1- 3 on the north side of I-10. The Consultant shall use the U.S. Army Corps of Engineers computer program HEC-1, 1989 version (or later version if approved by the Flood Control District), to develop a hydrologic model for the area. Using appropriate hydrologic judgement, sub-basins are to be identified that provide reasonable depiction of the watershed condition. The sub-basins must be as homogeneous as possible (i.e. separate mountainous and flat lands or urban and undeveloped areas into different sub-basins). The selection of the sub-basins must also take into account the need for discharge values at various points to allow for floodplain delineation and for future development needs within the basin. Discharge values will be required for all crossings of the Sun Valley Parkway. A study of the effects of sediment transport, culvert capacity, flow parallel to the Parkway, combined flows and roadway overtopping will be made. An appropriate time step and number of ordinates to be selected that allows for complete calculation of the flood hydrograph without sacrificing resolution of the flood peak. All calculations, or assumptions used in developing sub-basin and routing parameters shall be documented and made a part of the appendix for the hydrology report.

3.2 The specific hydrologic techniques to be used in this study are described in detail in the Hydrologic Design Manual for Maricopa County, Arizona. The following hydrologic methods, as described in the Design Manual, should be used to develop the HEC-1 model. Departures from the recommended methods and procedures may be appropriate to the study, but must be approved by the Flood Control District.

- a. Rainfall: 100-year 6-hour storm, using the District's Distribution(s) and 100-year 24-hour storm, using SCS Type II Distribution.
- b. Areal reduction: The rainfall must be areally reduced separately for critical concentration points as well as for the entire watershed. Corps of Engineers Queen Creek areal reduction is to be used with the 6-hour rainfall. NOAA HYDRO-40 can be used with the 24-hour rainfall reduction. Copies will be provided by the District.
- c. Losses: Green - AMPT: based on soil texture data.
- d. Unit Hydrograph: Clark & S-Graph: Clark method normally recommended for small sub-basins having a short time of concentration, shorter than the duration of the most intense

- excess rainfall. The S-graph normally used with sub-basins having an area of more than 5 square miles. For this study many of the sub-basins may be less than 5 square miles but would probably have a time of concentration of greater than the duration of the most intense excess rainfall, thus, the use of the S-graph method should be considered for the entire area.
- e. Time of Concentration: Papadakis method should be used with the Clark unit hydrograph. The S-graph lag equation should be used for the S-graph method.
 - f. Routing: Normal Depth routing. The cross sections may be developed from available maps but they must be field verified. The resulting velocities must be assessed for realistic values.
 - g. Transmission loss: Transmission losses through the channel bed must be developed and incorporated into the HEC-1 model. If sufficient data is not available, the final report must acknowledge so and explain how the peaks and volumes of flow are affected by not including the transmission losses.
- 3.3 The District will provide appropriate references to facilitate parameter estimation.
- 3.4 Output of the computer model should be reviewed to see if the peak flows and volumes are realistic. Adjustments to input for obtaining the most realistic results is normal to the scope.
- 3.5 Every attempt must be made to recover historic stream gage data where available and use them to compare with the results obtained by the hydrologic model. Major differences must be justified and discussed in the final report.
- 3.6 It is required that the Consultant deliver the hydrologic report and obtain the approval of the District at each of the following steps:
- a. Draft base map with sub-basin boundaries overlay. This map will be examined and approved by FCD.
 - b. Draft Precipitation Calculation report. This section will have the required isopluvial maps, total rainfall to be used, areal reduction factors, distribution curves and all other pertinent information. A brief discussion may be included for procedures used.
 - c. Draft Precipitation Losses report. This will include the parameter estimation for the Green and Ampt Losses, map units, area averaged parameters, percent imperviousness and all other pertinent information. A sample calculation and necessary information including maps must be included in the draft form.
 - d. Draft Hydrograph generation report. For S-graphs, all information including sub-basin areas, length and length to centroids, watershed friction coefficients, lag times, and other pertinent information must be included.
 - e. Draft routing report. This will include all the routing reach lengths, slopes, typical cross sections, Manning's "n" values, structure dimensions (culvert diameter, etc.), transmission

infiltration losses (if any), ponding stage/storage/discharge curves and all other pertinent information. Brief discussion of procedure and a map showing routing reaches and the structures must be included.

- f. HEC-1 including schematic on floppy disk. Extensive use of comment cards is strongly recommended.
- g. Preliminary hydrology report including all the above plus calibration tests and results, comparisons, conclusions and tables.
- h. Final hydrology report.

3.7 Final report should include the following sections:

- a. Scope of the study.
- b. Description of the watershed.
- c. Previous studies and reports.
- d. Methodology.
- e. Assumptions.
- f. Results.
- g. Comparison of the results with other studies and/or stream gages.
- h. Conclusion.
- i. List of references and agencies contacted.

3.7.1 Tables and figures for the main text:

- a. Watershed area (11 x 17) foldout map.
- b. Table showing the flow peaks and volumes at critical concentration points for different rainfall total and distributions.
- c. Table showing the critical peaks and volumes for major concentration points as compared to previous studies (where available).
- d. Spread sheet showing all the sub-basins and their major parameters (slope, area, friction, total rainfall, Time of concentration of Lag, major structures, soil types, Green and Ampt parameters, etc.).

3.7.2 Tables and figures for the appendices:

- a. Topographic base map showing the sub-watersheds, routing reaches, Tc calculation paths, major man made structures, and references (i.e. street names, Township Range Section, etc.) at scale of 1: 24000 (1" = 2000').
- b. Soils map at the same scale as the base map digitized from the US SCS soils maps for the Aquila-Carefree Area.
- c. Schematic map for the HEC-1 showing the sub-basins (area, Tc), the flow paths, the routing reaches (length, slope, friction, width, associated velocities, associated transmission losses, etc.), order of combining the hydrographs, channel, pipe or culvert dimensions (where appropriate).
- d. Pertinent data on all the structures in the watershed (such as spillway elevation, rating curves, etc.).

- d. Profiles of the northbound lane and the east flowline of Sun Valley Parkway within the watershed.
- 3.8 Five meetings associated with four tasks, and two field trips shall be held with the Flood Control District staff at the following mile stones:
- a. One field trip at the start of the project to scope out the critical points of the watershed and problem areas.
 - b. Meeting number 1 as soon as basic data are gathered and sub-basins have been delineated. Sample parameter estimations should be presented and discussed at this meeting. A copy of the draft maps of the sub-basins must be delivered to the District at this meeting.
 - c. Meeting number 2 shall be as soon as practicable after meeting number 1. It shall be with personnel of ADWR with the purpose of discussing methods to be used and getting input from ADWR personnel.
 - d. Meeting number 3 after all the parameters have been estimated. A draft copy of the parameters must be delivered to the District at least a week prior to this meeting.
 - e. Meeting number 4 after the preliminary HEC-1 results have been obtained and a draft report has been prepared. A copy of the draft report and the copy of the HEC-1 on a floppy disc compatible with the Flood Control District computer must be delivered to the District one week prior to the meeting. The Flood Control District may request that a second copy be forwarded to ADWR for their review and comment.
 - f. Meeting number 5 to review comments by the District and ADWR one week after the Consultant has received the District's comments. The District will require a minimum of two weeks to review the report and the model. Second field trip may be scheduled for the same day so the results obtained could be discussed.

Specific deviations from this hydrologic scope shall not be undertaken without the specific written concurrence from the Flood Control District.

Task 4 Field Survey

- 4.1 Prepare topographic mapping to a 4 foot contour interval with a scale of 1" = 400 feet, with spot elevations at 500 feet on all improved section line and mid-section line roads, for the selected 12 miles of floodplain/floodway delineation areas and the area for 200 feet east of the Sun Valley Parkway.

- 4.2 Ground Control for Floodplain Delineations:
- a. All topographic mapping and survey work shall meet or exceed Federal Emergency Management Agency (FEMA) minimum criteria as defined in FEMA Document 37, Flood Insurance Study Guidelines and Specifications for Study Contractors, Appendix 4, March 1991. This would include, but is not limited to: the establishment of "permanent" Elevation Reference Marks (ERMs); field control; and verification of profiles by the ground survey profile procedure.
 - b. Horizontal and Vertical Control: Systematically set panel points and establish horizontal and vertical control throughout the area to be mapped for use in compilation by the aerial survey contractor. Where readily available, surveys will tie into State Plane Coordinate System 1983 NAD. Field control shall be sufficient, at least one "permanent" point per mile, such point(s) being used as Elevation Reference Marks (ERMs). Surveys will be based on National Geodetic Vertical Datum (NGVD), per FEMA guidelines. "Permanent" survey points shall consist of existing monumentation, such as brass caps or similar survey monuments. Where additional monumentation is needed, survey markers conforming to Maricopa Association of Governments (MAG) Uniform Standard Detail for Public Works Construction, detail 120-1, Type C, shall be placed 2" +/- above grade. Elevation Reference Marks will be labelled on available maps and described in a manner which allow them to be readily located in the field.
 - c. "As-Built" plans or surveys of all bridges and hydraulic structures are to be obtained by the Study Contractor from the County Highway Department.
 - d. The Consultant shall verify profiles for mapped floodplains. The ground survey profile procedure as described in FEMA Document 37 or other methods approved by FEMA.
- 4.3 The contractor will conduct field reconnaissance of the full study reach. This will include observation of channel and floodplain conditions at eight locations for estimation of Manning's "n" values; photographic documentation of floodplain characteristics; determination of channel bank stations; observation of possible overflow areas; and inspection of levees or other flood control structures.
- 4.3.1 A written summary of the field inspection, including photographs to document "n" value estimation will be submitted to the District for review and approval.

Task 5 Floodplain and Floodway Delineation

- 5.1 Floodplain and floodway delineations must be obtained using the U.S. Army Corps of Engineers HEC-2 Water Surface Profiles computer model,

1989 version, and using methodology acceptable to FEMA. This model will simulate the effects of floodplain geomorphology, flow changes, bridges and culverts, hydraulic roughness factors, effective flow limitations, split-flows, and other considerations. The Consultant will prepare the study using the guidelines established in "The Flood Insurance Study Guidelines and Specification for Study Contractors", dated September 1985 and "Appeals, Revisions, and Amendments to Flood Insurance Maps", March 1991.

- 5.2 Bridges and Culverts must be modeled in compliance with HEC-2 modeling requirements for the selected routine. Where multiple bridges occur, each bridge will be modeled separately.
- 5.3 Cross Sections - Stationing will be from left to right looking downstream. Cross sections will be spaced approximately every 500 feet, unless geographic or structural constraints dictate otherwise. Identification of cross sections will be in river miles, increasing upstream. The stationing will tie into the specified river mile of the existing FEMA studies. The location and alignment of cross sections and channel centerline will be submitted for the Flood Control District's review and approval prior to digitizing cross section data. Cross section orientation may need to be altered after running of HEC-2 model to make sure that they are perpendicular to flow per FEMA criteria.
 - 5.3.1 All cross sections will be plotted using a pen plotter. The cross section plots will show water surface profiles, ineffective flow areas, "n" values, encroachments, channel stationing and other pertinent information. These plots are to be available at all reviews.
- 5.4 For floodplains identified as ponding areas, it is preferable to analyze the area by using the HEC-2 model, which will provide the District with water-surface-elevations. If appropriate, the Consultant shall identify in the ponded floodplains a floodway. The purpose of this floodway is to allow the pond to seek a constant stage throughout the areal extent of the ponds, versus the creation of two independent ponds.
 - 5.4.1 The Buckeye structures shall be analyzed on the following basis: Mapping and hydraulic analysis of the structures is not included in the project, the Contractor shall perform two backwater calculations: (1) assuming that the Buckeye structure channel water level is below a level that effects backwater in White Tanks Wash, and (2) assuming that the 60" diameter outfall pipe is partially plugged and some flow is over the spillway. The backwater curve for (2) will begin at elevation 1081.0 at the mouth of White Tanks Wash (one foot above spillway crest).
- 5.5 Flood zones must be determined according to FEMA criteria.

- 5.6 The Contractor will prepare working maps and models of the 100-year floodplain and floodway during the course of the hydraulic modeling analysis for review by the Flood Control District a progress meetings. Floodways are to be determined using equal conveyance encroachment methods to start with, but only encroachment method 1 will be used in the final analysis.
- 5.7 The delineation work shall meet requirements for floodplain delineations as prescribed by FEMA and the Arizona Department of Water Resources.
- 5.8 The final report of the floodplain/floodway delineation study will include, but is not limited to the following:
- I. Introduction
 - a. Purpose of study
 - b. Authority for study
 - c. Coordination and acknowledgements
 - II. Area Studied
 - a. Scope of study
 - b. Community description
 - c. Principal flood problems
 - d. Flood protection measures
 - III. Engineering methods
 - a. Hydrologic analysis
 - b. Hydraulic analysis
 - IV. Floodplain Management applications
 - a. Flood boundaries
 - b. Floodways
 - V. Insurance applications
 - VI. Other studies
 - VII. Location of data
 - VIII. Bibliography

Task 6 Coordination

- 6.1 The Consultant shall participate in regular coordination meetings (at least every three weeks) with the District's Project Manager and in Milestone Coordination meetings in the development of the hydrologic and hydraulic analyses.
- 6.2 Prior to finalizing of the hydraulic analysis, the Consultant will submit maps, report, and HEC-1 model through the District to ADWR and any other governmental agency reviewers. The Consultant will respond to questions by the reviewers and make modifications to the hydrologic maps, model, and report if necessary.
- 6.3 The Consultant shall submit maps, report, HEC-2 model through the District to ADWR, FEMA for review by the Technical Evaluation Contractor (TEC), and any other governmental agency reviewers. The Consultant will respond to questions by the reviewers and make modifications to the hydrologic maps, model, and report if required.

Task 7 Final Products

7.1 Mapping:

- a. One complete set of 9" x 9" contact prints at a scale of 1" = 1350' of the aerial stereo photographs sequentially numbered and catalogued for the area bounded by Buckeye Structure No. 1, a line 200 feet east of the Sun Valley Parkway, and the ridge west of White Tanks Wash.
- b. One complete set of contour maps, blue-line, draft copy for Flood Control District reference during the project, delivered immediately following the topographic mapping.
- c. One complete set of contour maps at 1" = 400' scale with the floodplain delineations in reproducible form (mylar) and six blue-line copies as outlined in Task 2.
- d. One set of transparent overlays of photo-mylar aerial photographs matching the above contour maps (c).
- e. One complete set of mylars for the foldout maps (no larger than 11" x 17") used in the report.
- f. Two complete sets of 9" x 9" contact prints of aerial stereo photographs covering the entire Buckeye Structures drainage area at 1" = 2000'.

7.2 Digital submission of GIS data shall be in accordance with the attached Appendix A - GIS Data Specification p. 1-8 which will reproduce the final study maps.

7.3 Six hard copies of the HEC-2 and HEC-1 printouts and a copy of the HEC-2 and HEC-1 model input/output on 5-1/4", 1.2 Mb diskettes compatible with an IBM-AT personal computer.

7.4 Tabular list of control points (ERMs) used with descriptions, elevations, and coordinates.

7.5 Reports:

- a. The contractor will produce a final report incorporating the comments of the District, FEMA and other reviewers. Six copies of the Hydrology and Hydraulics reports as outlined in Tasks 3 and 5 respectively, will be delivered.

7.6 Documentation for this study will be as outlined in Instructions for Organizing and Submitting Technical Documentation for Flood Studies as required by ADWR.

APPENDIX A - GIS DATA SPECIFICATION

1. Topographic mapping, floodplain delineation mapping, hydrologic watershed boundaries, and soils group boundaries shall be submitted in a digital format acceptable to the Flood Control District of Maricopa County. The requirement for digital submission is in addition to any requirements for written (hard-copy) data and reports which may be required elsewhere in the scope, in this Appendix, or by law.
2. Data required by this scope of work or by this or other Appendix or Supplement to this scope of work shall be prepared as ESRI Arc-Info coverages in accordance with the instructions in this specification. Hardcopy maps, drawings, renderings, plots, and related items required by this scope or its supplements or be law shall represent final data which as been or is being delivered in fulfillment of the requirements of the scope of work. The maps, drawings, renderings, plots, or related items shall be reproducible at the time of submission and acceptance on the target computer system from the data, AML macros, and other information delivered.

3. COVERAGES SPECS

3.1 GENERAL INFORMATION

- 3.1.1. The Arc-Info coverages should have defined spatial relationships. (Built Topology - Area Definition, Connectivity and Contiguity)
- 3.1.2. The FCDMC will supply a coverage with the State Plane Section Corners and a coverage with the County border. Attributes on the PAT of the Section corners are the type of marker and the source of the point. If more accurate points are located by this study (GPS or surveyed), then the coverage supplied by the FCD should be revised and updated with the new and more accurate information. The new updated section corners should be used as the registration Tics of ALL the coverages. Labeling of the Tics should be done according to the file supplied by the FCD.
- 3.1.3. Annotation should be placed in different levels depending on the map scale. For example when annotating roads, the main mile road names should be in one level and the minor road names should be in a different level. The AAT and the PAT files should also include an item that identifies the features that have been labeled with annotation. For example, the road.pat should have an item :Road-Name that includes the name of the road.
- 3.1.4. When digitizing from different map sources, if the source map is using a projection different than State Plane (Transverse Mercator, etc), appropriate steps should be taken to ensure that the digitized lines are projected back to State Plane.

3.2 COVERAGES:

A. INDEX

This coverage should have the page layout as presented in the plotted mylars.

Coverage Name: WTINDEX
 Coverage Type: Polygon

Codes: The following codes should be added to the PAT

Item Name:	Page#
Item Width, Output Width and type Information:	3,3,I Page Layout

B. TOPOGRAPHY

Coverage Name: CONTOURS
 Coverage Type: Line

ITEMS:	MAJOR1	4,4,I
	MINOR1	4,4,I
	MAJOR2	4,4,I
	MINOR2	4,4,I
	MAJOR3	4,4,I
	MINOR3	4,4,I

Codes:	Feature		Description		Parameter	
	MAJOR1	MINOR1	MAJOR2	MINOR2	MAJOR3	MINOR3
Index Contour	020	0200	020	0600	021	(elev.)
Hidden Indx Cont	020	0200	020	0650	021	(elev.)
Depression Idx Cont	020	0200	020	0611	021	(elev.)
Intermediate Cont	020	0250	020	0600	021	(elev.)
Hidden " "	020	0250	020	0650	021	(elev.)
Depression " "	020	0250	020	0611	021	(elev.)

NOTE: (elev.) should be the contour elevation.

C. CONTROL POINTS

Coverage Name: CONTROLPNTS
 Coverage Type: point

ITEMS: MAJOR1 4,4,I
 MINOR1 4,4,I
 MAJOR2 4,4,I
 MINOR2 4,4,I
 MAJOR3 4,4,I
 MINOR3 4,4,I

Codes:	Feature		Description		Parameter	
	MAJOR1	MINOR1	MAJOR2	MINOR2	MAJOR3	MINOR3
Horizontal Control	300	0050	020	060L	021	(elev.)
Vertical Control	300	0051	020	060L	021	(elev.)
Spot Elevation	020	0300	020	060L	021	(elev.)
Section Corner	300	0001	020	060L	021	(elev.)
Property Corner	300	0052	020	060L	021	(elev.)

NOTE: L=value of the decimal fraction of the spot elevation.
 (elev.) = integer part of the elevation

Example: an spot elevation of 1325.8 ft should be coded as follows:
 300 0050 020 0608 021 1325

D. TRANSPORTATION

Coverage Name: ROADS
 Coverage Type: Line

ITEMS: MAJOR1 4,4,I
 MINOR1 4,4,I
 MAJOR2 4,4,I
 MINOR2 4,4,I
 MAJOR3 4,4,I
 MINOR3 4,4,I
 RDNAME 23,23,C

Codes:	Feature		Description		Parameter	
	MAJOR1	MINOR1	MAJOR2	MINOR2	MAJOR3	MINOR3
Roads (Conc/Asph)	170	0209*	0	0	0	0
Improved Dirt Rd	170	0250	170	064	0	0
Trails	170	0211	0	0	0	0
Pavement Edge	170	0300	0	0	0	0
Railroads	180	0201	0	0	0	0

*NOTE: 209 for Road or Street Class 3
 210 for Road or Street Class 4

Roads should be annotated in 2 different levels depending on the class type.

E. WATER FLOW LINES

Coverage Name: FLOW
Coverage Type: Line

For future modeling of water flow within ARC-INFO it is required that the lines that describe the water flow are digitized in the direction that the water is flowing.

ITEMS: MAJOR1 4,4,I
MINOR1 4,4,I
MAJOR2 4,4,I
MINOR2 4,4,I
MAJOR3 4,4,I
MINOR3 4,4,I

Codes:	Feature		Description		Parameter	
	MAJOR1	MINOR1	MAJOR2	MINOR2	MAJOR3	MINOR3
Water Flow lines	050	0470	0	0	0	0

F. MUNICIPAL BOUNDARIES

Coverage Name: MUNICIPAL
Coverage Type: Polygon

ITEMS: MAJOR1 4,4,I
MINOR1 4,4,I
MAJOR2 4,4,I
MINOR2 4,4,I
MAJOR3 4,4,I
MINOR3 4,4,I
NAME 23,23,C

Codes:	Feature		Description		Parameter	
	MAJOR1	MINOR1	MAJOR2	MINOR2	MAJOR3	MINOR3
Boundaries	090	0100	0	0	0	0

G. WATERSHEDS BASINS AND SUBWATERSHEDS

Coverage Name: WATERSHED-NAME
Coverage Type: Polygon

ITEMS: MAJOR1 4,4,I
MINOR1 4,4,I
MAJOR2 4,4,I
MINOR2 4,4,I
MAJOR3 4,4,I
MINOR3 4,4,I
WSNAME 10,10,C

Codes:	Feature		Description		Parameter	
	MAJOR1	MINOR1	MAJOR2	MINOR2	MAJOR3	MINOR3
Boundaries	050	0150	0	0	0	0

The coding scheme of the WSNAME should provide the capability of being able to redefine items in INFO and be able to group the subwatersheds into the watersheds.

H. SOILS

Soil types should adhere to SCS coding scheme.

Coverage Name: SOILS
Coverage Type: Polygon

ITEMS:	MAJOR1	4,4,I
	MINOR1	4,4,I
	MAJOR2	4,4,I
	MINOR2	4,4,I
	MAJOR3	4,4,I
	MINOR3	4,4,I
	SOILTYPE	5,5,C
	TEXTURETYPE	4,4,I

Codes:	Feature		Description		Parameter	
	MAJOR1	MINOR1	MAJOR2	MINOR2	MAJOR3	MINOR3
Boundaries	090	0170	0	0	0	0

SOIL DESCRIPTION TABLE:

A table that relates Soil Type Codes with their description should also be supplied.

ITEMS:	SOILTYPE	5,5,C
	DESCRIPTION	50,50,C

TEXTURE DESCRIPTION TABLE:

A table that relates Texture Type codes with their description should also be supplied.

ITEMS:	TEXTURETYPE	4,4,I
	DESCRIPTION	50,50,C

I. FLOODWAY

Coverage Name: FLOODWAY
Coverage Type: Polygon

ITEMS:	MAJOR1	4,4,I
	MINOR1	4,4,I
	MAJOR2	4,4,I
	MINOR2	4,4,I
	MAJOR3	4,4,I
	MINOR3	4,4,I

Codes:	Feature		Description		Parameter	
	MAJOR1	MINOR1	MAJOR2	MINOR2	MAJOR3	MINOR3
Floodway	050	0670				
Floodway Fringe	050	0671				

J. HAZARD ZONES

	Coverage Name:		ZONES			
	Coverage Type:		Polygon			
ITEMS:	MAJOR1	4,4,I				
	MINOR1	4,4,I				
	MAJOR2	4,4,I				
	MINOR2	4,4,I				
	MAJOR3	4,4,I				
	MINOR3	4,4,I				
	ZONENAME	4,4,C				
Codes:	Feature		Description		Parameter	
	MAJOR1	MINOR1	MAJOR2	MINOR2	MAJOR3	MINOR3
Zones	050	0170	0	0	0	0

The Zone name should be annotated in level one and also be included in the PAT file.

K. FEMA REFERENCE MARKS

	Coverage Name:		BM			
	Coverage Type:		Point			
ITEMS:	MAJOR1	4,4,I				
	MINOR1	4,4,I				
	MAJOR2	4,4,I				
	MINOR2	4,4,I				
	MAJOR3	4,4,I				
	MINOR3	4,4,I				
	BM-ID	4,5,B				
Codes:	Feature		Description		Parameter	
	MAJOR1	MINOR1	MAJOR2	MINOR2	MAJOR3	MINOR3
Benchmarks	020	0300	020	060L	02N	(elev.)

BENCHMARK DESCRIPTION TABLE:

A table that relates the benchmark to the description and remarks should also be supplied:

ITEMS:	BM-ID	4,5,B
	DESCRIPTION	200,200,C

L. FLOOD ELEVATION LINES:

Coverage Name: SWE
Coverage type: Line

ITEMS: MAJOR1 4,4,I
MINOR1 4,4,I
MAJOR2 4,4,I
MINOR2 4,4,I
MAJOR3 4,4,I
MINOR3 4,4,I

Codes:	Feature		Description		Parameter	
	MAJOR1	MINOR1	MAJOR2	MINOR2	MAJOR3	MINOR3
Elev at X-Sec	020	0270	020	060L	02N	(elev.)
SWE (As per FIRM)	020	0271	020	060L	02N	(elev.)

Lines should be annotated with the appropriate elevation in the coverage.
The FCD will supply the symbol set file for SWE (As per FIRM) lines, to ensure uniformity at plotting time.

M. MAN MADE FEATURES (bridges/Culverts)

Coverage Name: BRIDGES
Coverage type: Line

Codes for man made feature are still pending.

3.3 NOTES:

This is a preliminary list that describe 13 different coverages that would cover the total of the information that is presented in Hard copy form. If there is additional information that makes part of the mylar and is not included in this list, then these features should be added to one of the above coverages or to a new one, as coordinated with the District.

- Arc-Info coverages shall be prepared in accordance with procedures and practices of Release 5.01 or later of the Arc-Info software running on a Data General Aviiion 410 DG/UX workstation or a hardware platform capable of producing coverages and files which can be transferred to the target system without any loss of data or data integrity or reliability modification. Use of single precision m=numbers to allow data development on personal computes systems is permitted if the consultant determines that use of single precision numbers will not adversely affect the quality or reliability of the data.
- Consultant may develop or manipulate data on any system of his choosing and convert that data to the required Arc-Info coverages. However, the Arc-Info coverages, text, and data shall be the official version of the data submitted in fulfillment of the contract. See paragraph 3 above for related stipulations.

6. Features for which there is an entry in an AAT or PAT file must have a User-ID assigned to it. Where coding is required, features in a coverage shall be attributed in the AAT or PAT files with descriptive codes taken from the publication, "Appendix D, Digital Line Graphs from 1:100000 - Scale Maps - Data Users Guide 2, National Mapping Program, Technical Instructions, US Department of Interior, USGS, National Mapping Division". If this scope requires identification of a feature for which no appropriate code exists (such as floodplain limits) the code shall be taken from the Flood Control District which shall assign a code to the feature. Coverages containing codes not-obtained through one of these methods will be returned for correction.
7. Consultants shall document the data structure of each coverage provided and shall endeavor to use a similar table structure, column labeling conventions, column data types, and so forth from coverage to coverage. Documentation shall be prepared in accordance with paragraph 1 of this Appendix.
8. Consultant may select or design symbols, line types, annotation style, and fill patterns and colors, Arc Macro Language routines, and the like to produce attractive and useful maps. These elements must be submitted to the FCD in appropriate exchange files such that the provisions of paragraph 3 can be met. Full textural documentation of these elements is required.
9. Data required by the contract and amendments thereto shall be submitted in the Arc-Info release 5.01 "EXPORT" (.e00) file format. Arc-Info coverages shall be prepared in accordance with Arc-Info Release 5.01 or later running on a Data General Aviiion 410 workstation (target system) or on a computer system capable of producing Arc-Info "EXPORT" files which can be transferred to the target system using the Arc-Info "IMPORT" utility. EXPORT files shall be copied to QIC-150 formatted, 150 MB, 1/2-inch data cartridges in a POSIX-compliant TAR format. Floppy disks, reel-to-reel, CD-ROM, and other media are not acceptable.

2701 E. Camelback Rd., Suite 100
Phoenix, AZ 85016-4306
(602) 954-0436 Fax: (602) 954-6273



ALPHA
Engineering
Group,
Inc.

10 June 1992

Hydrology Branch
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, Arizona 85009

Attn: Mr. Tim Murphy, Project Manager

Subject: Request For Time Extension
White Tanks Wash Flood Insurance Study, Contract FCD 90-64

Dear Mr. Murphy:

ALPHA Engineering Group, Inc. hereby requests an extension of the Period of Service from the contract time of 300 calendar days to 400 calendar days from Notice to Proceed. The revised completion date will be October 30, 1992. This is a no cost change order request. Although the extended contract period is in excess of one year, the provision in the contract for adjustment of the consultant's fees in accordance with the Consumer Price Index for Urban Customers is waived by ALPHA.

This extension is by mutual agreement to include topographic data on the hard copy base map and to add land use symbols on the sub-basin boundary overlay map. Mylar originals of the quadrangle maps will be ordered from the USGS for the base map topographic information. This normally requires 1 to 3 months. The above additions will not be included in the GIS electronic database.

Sincerely,

ALPHA Engineering Group, Inc.

James R. Barr, PE
Project Manager

2929 East Camelback Road, Suite #215
Phoenix, AZ 85016-4426
(602) 954-0436 Fax: (602) 954-9198



ALPHA

Engineering

Group,

Inc.

24 February 1993

Hydrology Branch
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, Arizona 85009

Attn: Mr. Tim Murphy, Project Manager

Subject: Request For Second Time Extension
White Tanks Wash Flood Insurance Study, Contract FCD 90-64

Dear Mr. Murphy:

ALPHA Engineering Group, Inc. hereby requests an informal extension of the Period of Service for the above project to July 16, 1993. This is a no cost change order request. Although the extended contract period is in excess of one year, the provision in the contract for adjustment of the consultant's fees in accordance with the Consumer Price Index for Urban Customers is waived by ALPHA.

This extension is by mutual agreement to permit use of state of the art technology including scanning of the topographic data from USGS topography sheets and converting of the resulting raster image to a vector file that can be manipulated in the computer. The resulting map can be scaled to match the previously digitized basin and soil boundary maps. These three maps can then be directly overlaid and compared in the computer to remove any scale or significant digitizing differences. This will attain a higher quality product than the contract provisions require. The mylar originals of the quadrangle maps previously ordered from the USGS for the base map topographic information will be utilized for the scanning, with standard paper quads used as reference for manual corrections. The above additions will be available for inclusion in the GIS electronic database if desired for the cost of conversion into Arcadd.

A proposed schedule is attached for completion of the work and includes our best estimate of your review time. Several of the submittal items have previously been submitted and reviewed, but will be resubmitted with revisions made. Should the above not be in agreement with our verbal discussions or if you have additional questions, please contact us at your earliest convenience.

Sincerely,

ALPHA Engineering Group, Inc.

James R. Barr, PE
Project Manager

11 October 1993

Hydrology Branch
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, Arizona 85009

Attn: Mr. Tim Murphy, Project Manager

Subject: Request For Third Time Extension
White Tanks Wash Flood Insurance Study, Contract FCD 90-64

Dear Mr. Murphy:

ALPHA Engineering Group, Inc. hereby requests an informal extension of the Period of Service for the above project to June 17, 1994. This is a no cost change order request. Although the total extended contract period is in excess of one year, the provision in the contract for adjustment of the consultant's fees in accordance with the Consumer Price Index for Urban Customers is waived by *ALPHA*.

This extension is by mutual agreement to provide for the extended review period taken by ADWR and to include the expected time for the FEMA review, the GIS submittals and a revised analysis of the Sun Valley Parkway crossing. The single crossing of the Parkway as computed for each of the subbasins in HEC-1 was sufficient for the 6 hour storm. The 24 hour storm unexpectedly produced substantially higher flows that could not be handled by single crossings. *ALPHA* will subdivide the flow at the crossing based on the contributing area. The flow will be checked at each culvert crossing within the subbasin with any excess diverted manually to the next down-slope culvert. These flows will be separately routed through the subbasin immediately downstream of the Parkway until the branch streams join the main stream. This will also involve varying the flows at individual cross sections in the HEC-2 runs for the studied downstream subbasins. The previous extension had not included the time for the FEMA review nor final GIS submittals.

A proposed schedule is attached for completion of the work and includes our best estimate of your review time. The Introduction and HEC-1 submittal items have previously been submitted in preliminary form and reviewed. They will now be submitted in final form with the suggested revisions made. Should the above not be in agreement with our verbal discussions or if you have additional questions, please contact us at your earliest convenience.

Sincerely,

ALPHA Engineering Group, Inc.

James R. Barr, PE

SECTION 2: MAPPING AND SURVEY INFORMATION

2.1 DESCRIPTION OF MAPPING, MAP CONTROL AND OTHER SURVEY INFORMATION

2.2 INDEX OF MAPS

USGS 7½ MINUTE QUADRANGLE MAPS USED FOR HYDROLOGY:

BUCKEYE NW, ARIZ: 1958, Photorevised 1982, 10' CI.

WAGNER WASH WELL, ARIZONA: PROVISIONAL EDITION 1988, 20' CI.

WHITE TANKS MTS. SE, ARIZ: Photorevised 1971, 40' CI.

VALENCIA, ARIZ: Photorevised 1982, 20' CI

2.3 SURVEY FIELD NOTES

Photo Control Diagram

GPS Daily Reports and Sketches

Horizontal Control Point Data

State Plane Coordinate Conversion

Vertical Level Notes

Vertical Bench Mark Data

Aerial Large Block Adjustment

Final Control Coordinates

Map Control Coordinates

2.4 WATERSHED MAPS, HYDROLOGIC ANALYSIS MAPS

Basin Boundaries

2.5 HYDRAULIC ANALYSIS MAPS

Study Area Contour Maps

Cross Sections

2.6 FIRM, FHBM DRAFT MAPS

Draft FIRM Maps

2.7 COMMUNITY MAPS

Sun Valley Area Map

2.8 MISCELLANEOUS MAPS

Soils Type Boundaries

White Tank Mountains Flood Hazard Maps by John Field and Philip Pearthtree

2.1. Description of Mapping, Map Control and Other Survey Information

The hydrology base mapping for this project consisted of four United States Geological Survey (USGS) 7.5 minute quadrangle maps. Original single color mylar copies of these maps were purchased directly from USGS to obtain the best available quality. The portion of these maps that covered the study area drainage basin were scanned and digitized. This image was then converted to a vector drawing in Autocad with attributes assigned to each line. Text and line work were both edited manually and checked against original paper quadrangle maps. The resulting map was then utilized for the exhibits contained in this report. The USGS maps used are:

BUCKEYE NW, ARIZ: 1958, Photorevised 1982, 10' CI.

WAGNER WASH WELL, ARIZONA: PROVISIONAL EDITION 1988, 20' CI.

WHITE TANKS MTS. SE, ARIZ: Photorevised 1971, 40' CI.

VALENCIA, ARIZ: Photorevised 1982, 20' CI

As an augmentation to the above quadrangle maps, uncontrolled aerial photos flown by Aerial Mapping Company Inc. on 10-03-91 at a photo scale of 1:24,000 were used to identify drainage basin boundaries, stream locations and potential flow break out locations. These photos cover the entire drainage basin. Aerial Mapping Company, Inc. also flew photos at a photo scale of 1:16,300 for mapping of the study area only on 10-25-91. These photos were fully controlled for use in producing the contour maps of the study area. All photos are available for viewing at the Flood Control District of Maricopa County.

Horizontal control for the topographic mapping of the floodplain area was established by McEwen Global Positioning Systems, Inc. on September 24 and 25, 1991. The survey was performed as a differential static Global Positioning System (GPS) survey using Ashtech Geodetic GPS receivers model L-XII. The survey and calculations were by Brian Ewing, RLS under the supervision of Glen McEwen, RLS. The data was processed using Ashtech's Geodetic Post Processing System software. Five National Geodetic Survey Triangulation stations were used for primary control: Hassa, Pole 842, ERDL, GLO C2, and Dead. Coordinates were established for 19 points to provide aerial photo control for the study area with 16 being existing BLM or GLO section monuments that can be used to control property line information. Cross checks in the block adjustment of the data indicated a confidence level of 0.12 feet. The accuracy of the horizontal coordinates for the mapping control was further checked by analysis of the large block adjustment of the aerial triangulation which resulted in a mean error of 0.043' horizontally. The poorest correlation between points was field checked with an HP Electronic Distance Meter by Brooks, Hersey and Associates, Inc.

Vertical control was established by Brooks, Hersey and Associates, Inc. under the supervision of Sam Hersey, RLS. Control was based on NGS (formerly USCGS) benchmarks C264, W263, V362, Y263, and Z263 with differential leveling loop ties to second order accuracies but not using full NGS second order procedures. Ties were also made to Maricopa County Department of Transportation bench marks on culvert headwalls along the Sun Valley Parkway. These benchmarks were stamped MCHD 1360.37, 1367.20, 1367.94 and 1399.39. All loops were balanced and adjusted after closure. The control values on four points were provided to McEwen Global Positioning Systems, Inc. who performed a GPS block adjustment using these values for vertical control. The resulting elevations for the panel points were then compared with the adjusted differential level loop values for a check on the vertical values and a further check of the horizontal precision. The elevation differences on all points were substantially lower than the National Mapping Standards for the aerial triangulation control. A final confirmation of the accuracy of the levels was confirmed by the aerial triangulation residuals determined in the mapping.

Throughout the check process only one control point (W008) did not meet the specifications. As requested, the panel had been set at a section corner. The terrain at that location was irregular and the target elevation was difficult to determine in the aerial plotter. The initial residuals were high at this point, as shown in the Aerial Large Block Adjustment. The elevation was offset to a flat area on the adjoining roadway and checked against the aerial triangulation. After the mapping was adjusted to the new data, it meets or exceeds the National Mapping Standards. Four check traverses were ran across the mapping area with an electronic distance meter by Brooks, Hersey and Associates, Inc. and compared with the contour map to check the plotting and assure that National Map Standards were met for the final product.

The cross section locations were selected to be representative of the routing reach upstream and downstream using the study area contour maps, the aerial photos and field reconnaissance. Spacing of the cross sections was selected to balance the number of sections against the maximum length that would be representative. The cross sections were stereo-plotted directly from the 1:16,300 scale aerial photographs by Aerial Mapping Company, Inc.

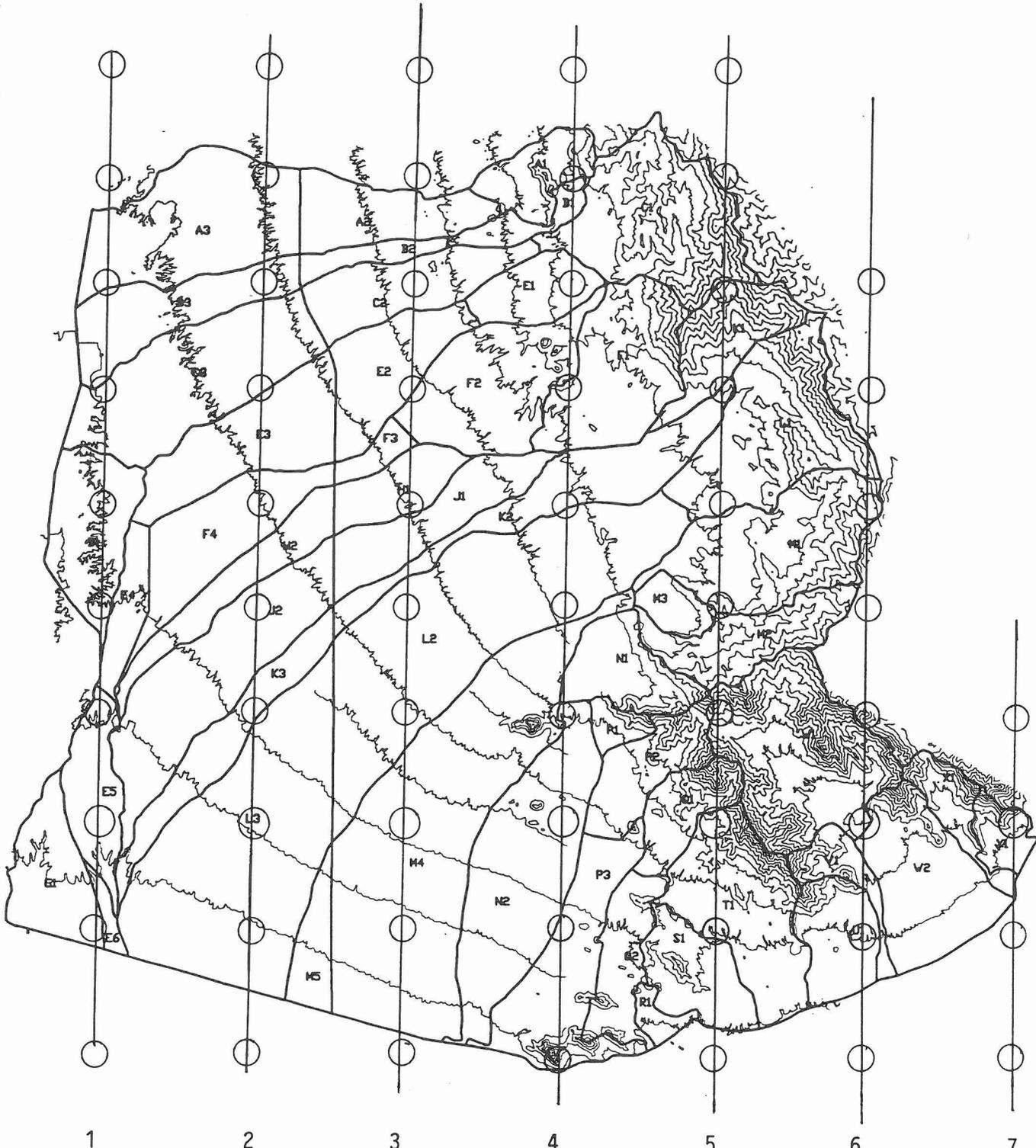
ELEVATION REFERENCE MARKS

1. ERM CBC25 = 1397.72 This station is a brass cap located in the northeast headwall of concrete box culvert #25 under the Sun Valley Parkway in Section 33, Township 3 North, Range 4 West.
2. ERM CBC23 = 1366.20 This station is a brass cap located in the northeast headwall of concrete box culvert #23 under the Sun Valley Parkway in Section 33, Township 2 North, Range 4 West.
3. ERM W046 = 1258.23 This station is a GLO brass cap at the NE Corner of Section 12, Township 2 North, Range 5 West at the corner of Sections 1, 6, 12 and 7.
4. ERM W045 = 1301.69 This station is a GLO brass cap at the NE Corner of Section 7, Township 2 North, Range 4 West at the corner of Sections 6, 5, 7 and 8.
5. ERM W043 = 1356.57 This station is a GLO brass cap at the NE Corner of Section 8, Township 2 North, Range 4 West at the corner of Sections 5, 4, 8 and 9.
6. ERM W018 = 1214.02 This station is a GLO brass cap at the NE Corner of Section 14, Township 2 North, Range 5 West at the corner of Sections 11, 12, 14 and 13.
7. ERM W019 = 1236.44 This station is a GLO brass cap at the NE Corner of Section 13, Township 2 North, Range 5 West at the corner of Sections 12, 7, 13 and 18.
8. ERM W020 = 1273.93 This station is a GLO brass cap at the NE Corner of Section 18, Township 2 North, Range 4 West at the corner of Sections 7, 8, 18 and 17.
9. ERM W021 = 1321.91 This station is a GLO brass cap at the NE Corner of Section 17, Township 2 North, Range 4 West at the corner of Sections 8, 9, 17 and 16.
10. ERM W037 = 1171.73 This station is a GLO brass cap at the NE Corner of Section 25, Township 2 North, Range 5 West at the corner of Sections 24, 19, 25 and 30.
11. ERM W263 = 1128.55 This station is a first-order USCGS bench mark on Line 101 in Section 26, Township 2 North, Range 5 West marked "W 263 1947".
12. ERM V362 = 1122.02 This station is a first-order USCGS bench mark on Line 101 in Section 36, Township 2 North, Range 5 West marked "V 362 1947".
13. ERM W013 = 1133.44 This station is a GLO brass cap at the NE Corner of Section 36, Township 2 North, Range 5 West at the corner of Sections 25, 30, 36 and 31.

- 14 - 14. ERM Y263 = 1129.41 This station is a first-order USCGS bench mark on Line 101 in Section 31, Township 2 North, Range 4 West marked "Y 263 1947".
15. ERM W035 = 1093.59 This station is a GLO brass cap at the NE Corner of Section 2, Township 1 North, Range 5 West at the corner of Sections 35, 36, 2 and 1.
- 16 - 16. ERM W009 = 1053.63 This station is a GLO brass cap at the NE Corner of Section 10, Township 1 North, Range 5 West at the corner of Sections 3, 2, 10 and 11.
17. ERM W010 = 1065.08 This station is a GLO brass cap at the NE Corner of Section 11, Township 1 North, Range 5 West at the corner of Sections 2, 1, 11 and 12.
- 18 - 18. ERM W008 = 1029.91 This station is a GLO brass cap at the NE Corner of Section 14, Township 1 North, Range 5 West at the corner of Sections 11, 12, 14 and 13.

SECTION 2.3 SURVEY FIELD NOTES

- **PHOTO CONTROL DIAGRAM**
- **GPS DAILY REPORTS AND SKETCHES**
- **HORIZONTAL CONTROL POINT DATA**
- **COORDINATE FIELD TIES**
- **STATE PLANE COORDINATE CONVERSION**
- **VERTICAL LEVEL NOTES**
- **VERTICAL BENCH MARK DATA**
- **AERIAL LARGE BLOCK ADJUSTMENT**
- **FINAL & CONTROL COORDINATES**
- **CULVERT STRUCTURE DATA**
- **CROSS SECTION CHECK**
- **SUN VALLEY PARKWAY DATA**



FLIGHT LINES

FIGURE 3

DAILY REPORT

WHITE TANK WASH ADMS 24 September, 1991

DAY 267

Operator	Station	Description	Receiver
SESSION A (STATIC)			
Dave	W024	NE COR. S2, T2N,R5W USGLO BC 1.1' ABOVE GRND. SEE DESCRIPTION	1
Jerry	W018	NE COR. S14, T2N,R5W USGLO BC 1.0' ABOVE GRND. SEE DESCRIPTION	2
Woody	W001	STATION "HASSA" (USC&GS) STD. USC&GS DISK SEE DESCRIPTION	3
Brian	W023	PANEL POINT SET 1/2" REBAR FLUSH SEE DESCRIPTION	4
SESSION B (STATIC)			
Dave	W022	PANEL POINT SET 1/2" REBAR 0.10' BELOW GRND. SEE DESCRIPTION	1
Jerry	W003	STATION "ERDL" (USC&GS) STD. USC&GS DISK SEE DESCRIPTION	2
Woody	W002	STATION "POLE 842" (USC&GS) STD. USC&GS DISK SEE DESCRIPTION	3
Brian	W023	PANEL POINT SET 1/2" REBAR SEE DESCRIPTION	4
SESSION C (STATIC)			
Dave	W020	NE COR. S18, T2N,R4W USGLO BC 0.80' ABOVE GRND. SEE DESCRIPTION	1
Jerry	W003	STATION "ERDL" (USC&GS) STD. USC&GS DISK SEE DESCRIPTION	2
Woody	W019	NE COR. S13, T2N,R5W USGLO BC 0.97' ABOVE GRND. SEE DESCRIPTION	3
Brian	W021	NE COR. S17, T2N,R4W MCHD BC IN HH 0.54' BELOW PVMT. SUN VALLEY PKWY. 5.7 mi. N. OF I-10	4
SESSION D (STATIC)			
Dave	W016	ECC. E 1/4 S23, T2N,R5W SET 1/2" REBAR FLUSH SEE DESCRIPTION	1
Jerry	W018	NE COR. S14, T2N,R5W USGLO BC 1.0' ABOVE GRND. SEE DESCRIPTION	2
Woody	W019	NE COR. S13, T2N,R5W USGLO BC 0.97' ABOVE GRND. SEE DESCRIPTION	3
Brian	W017	E 1/4 S22, T2N,R5W 1/2" REBAR FLUSH SEE DESCRIPTION	4

MGPS Inc

Adjusted Position Sta.(name) ^{ECC} E 1/4 SEC 23 T2N R5W Sta.# 11016

Latitude _____ Coord. Sys. _____

Longitude _____ Ellipsoid _____

Ellipsoidal Height _____ X _____

Geoid Height _____ Y _____

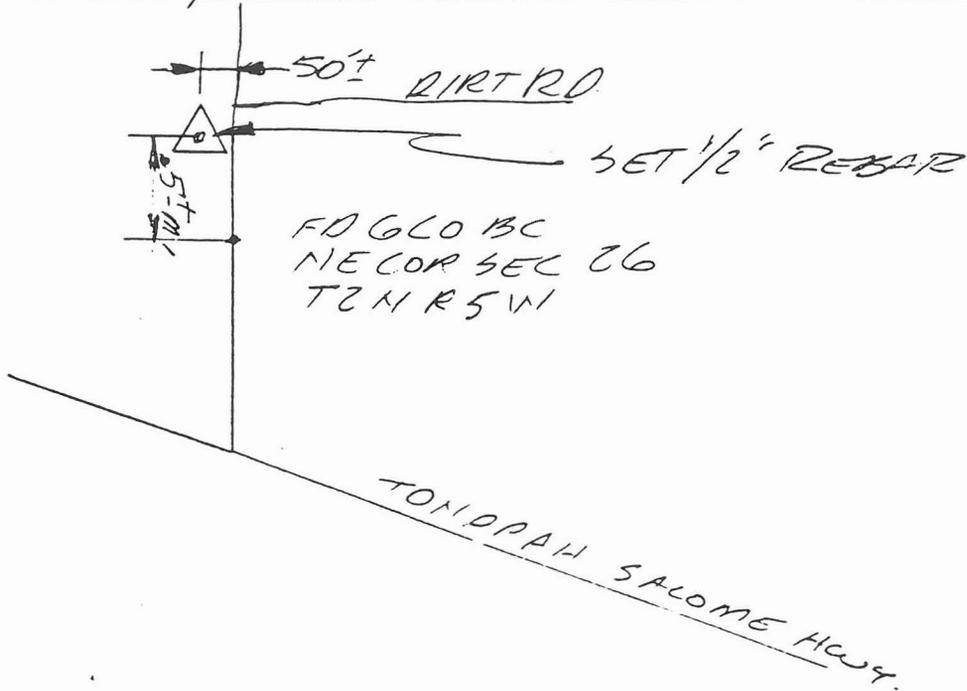
M.S.L. Elevation _____ Z _____

Vert. Datm Ref. _____

Location Sketch and Description

Date 9-24-91 Project WHITE TRAILS WASH

Type of Mark 1/2" R.B. Condition GOOD



Comments: _____

MGPS Inc

Adjusted Position Sta.(name) ^{E 1/4} ~~22~~ 22, T2N, R5W Sta.# W017

Latitude _____ Coord. Sys. _____

Longitude _____ Ellipsoid _____

Ellipsoidal Height _____ X _____

Geoid Height _____ Y _____

M.S.L. Elevation _____ Z _____

Vert. Datm Ref. _____

Location Sketch and Description

Date 9/24/91 Project WHITE TANK WASH ADMS

Type of Mark 1/2" RB w/PLCAP Condition GOOD

NO ADEQUATE TERRAIN FEATURES TO
DESCRIBE, STATION IS 0.5 MI. N. OF BC
FD. @

22	23
27	26

 T2N, R5W AND APPX. 0.2 MI.

WEST OF MAIN CHANNEL OF HASSAYAMPA
RIVER

Comments: 1/2" RB w/PL. CAP "R.L. FANNIN LS #14177" w/
STEEL "T" POST 4'± E. OF STA.

MGPS Inc

Adjusted Position Sta.(name) NECOR 518
TZN RAW Sta.# 14020

Latitude _____ Coord. Sys. _____

Longitude _____ Ellipsoid _____

Ellipsoidal Height _____ X _____

Geoid Height _____ Y _____

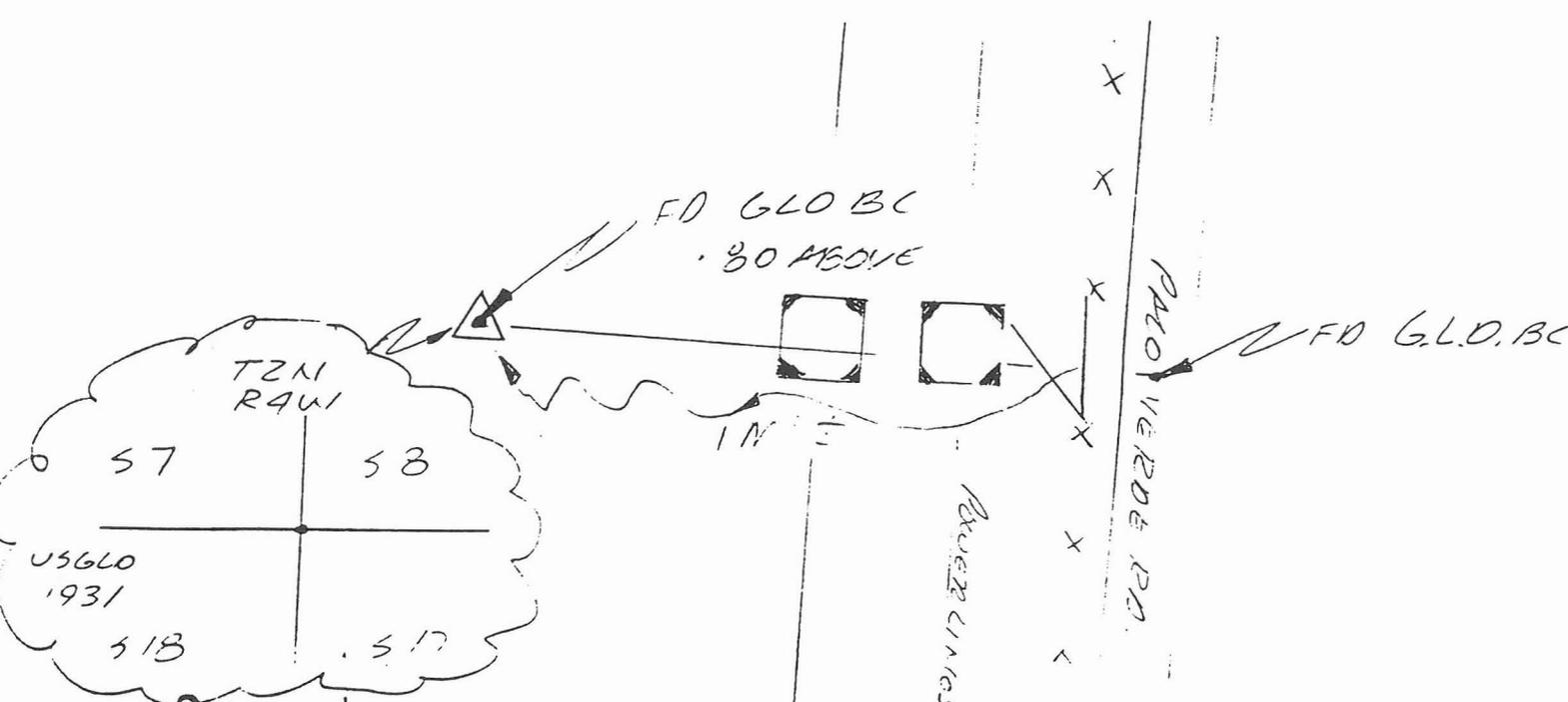
M.S.L. Elevation _____ Z _____

Vert. Datm Ref. _____

Location Sketch and Description

Date 9-29-91 Project WHITE TANKS WASH

Type of Mark GLOBE Condition GOOD



Comments: _____

MGPS Inc

Adjusted Position Sta.(name) NE 17, T2N, R4W Sta.# W021

Latitude _____ Coord. Sys. _____

Longitude _____ Ellipsoid _____

Ellipsoidal Height _____ X _____

Geoid Height _____ Y _____

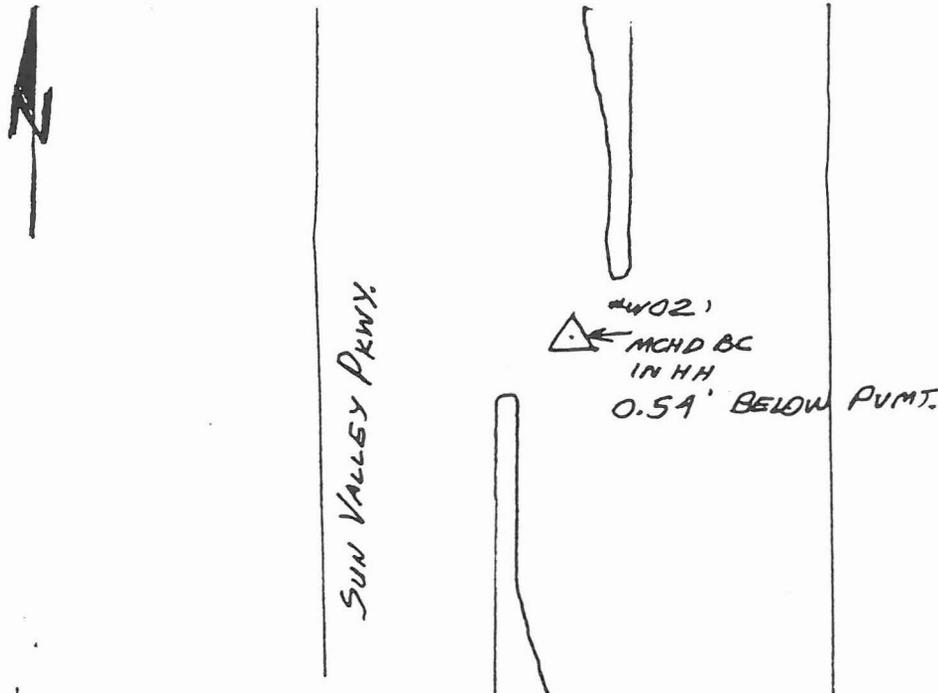
M.S.L. Elevation _____ Z _____

Vert. Datm Ref. _____

Location Sketch and Description

Date 9/24/91 Project WHITE TANK WASH ADMS

Type of Mark MCHD BC IN HH, Condition GOOD



Comments: _____

STA. IS 5.7 MI. N. OF I-10

MGPS Inc

Adjusted Position Sta.(name) NE 13 T2N-R5W Sta.# W019

Latitude _____ Coord. Sys. _____

Longitude _____ Ellipsoid _____

Ellipsoidal Height _____ X _____

Geoid Height _____ Y _____

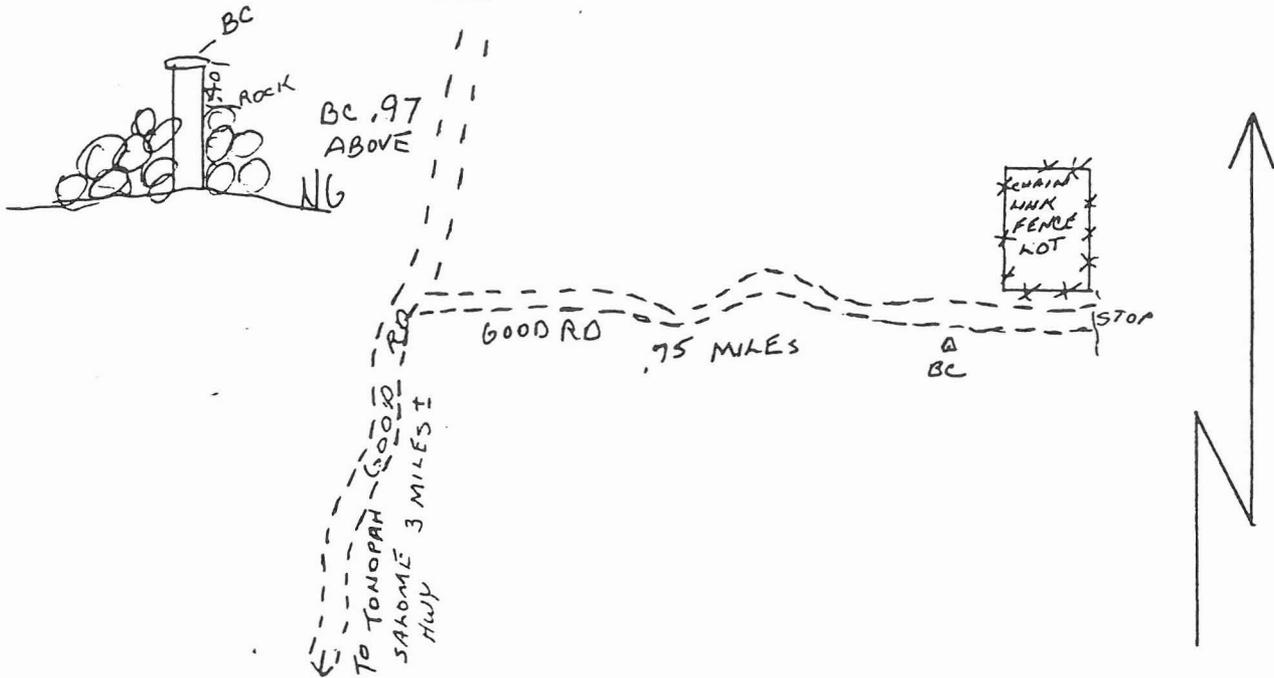
M.S.L. Elevation _____ Z _____

Vert. Datm Ref. _____

Location Sketch and Description

Date 9/24/91 Project WHITE TANK WASH

Type of Mark Glo BC Condition GOOD



Comments: _____

MGPS Inc

Adjusted Position Sta.(name) T2N-R4W TRI. STA. "ERDL" Sta.# W003

Latitude _____ Coord. Sys. _____

Longitude _____ Ellipsoid _____

Ellipsoidal Height _____ X _____

Geoid Height _____ Y _____

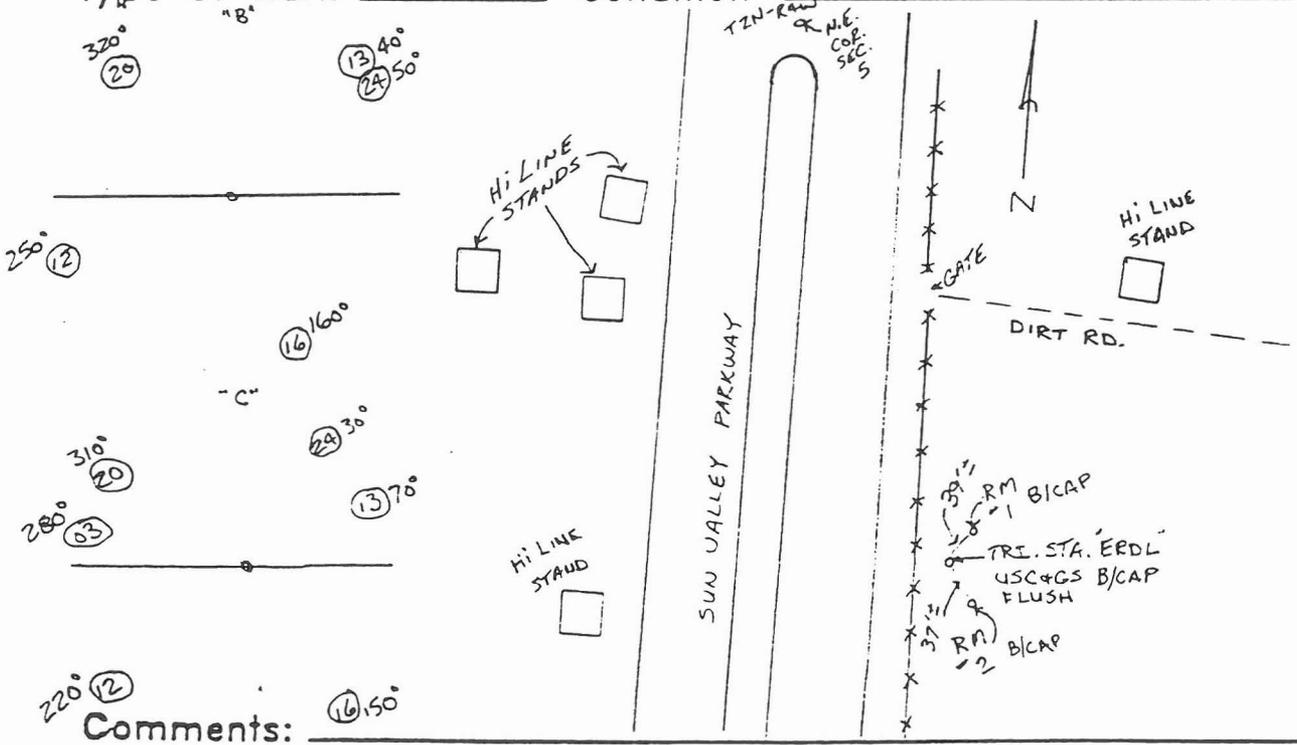
M.S.L. Elevation _____ Z _____

Vert. Datm Ref. _____

 Location Sketch and Description

Date 9/24/91 Project WHITE TANKS WASH

Type of Mark USC&GS B/CAP Condition GOOD



Comments: (16) 50°

MGPS Inc

Adjusted Position Sta.(name) R.P. 1110ZZ Sta.# 1110ZZ

Latitude _____ Coord. Sys. _____

Longitude _____ Ellipsoid _____

Ellipsoidal Height _____ X _____

Geoid Height _____ Y _____

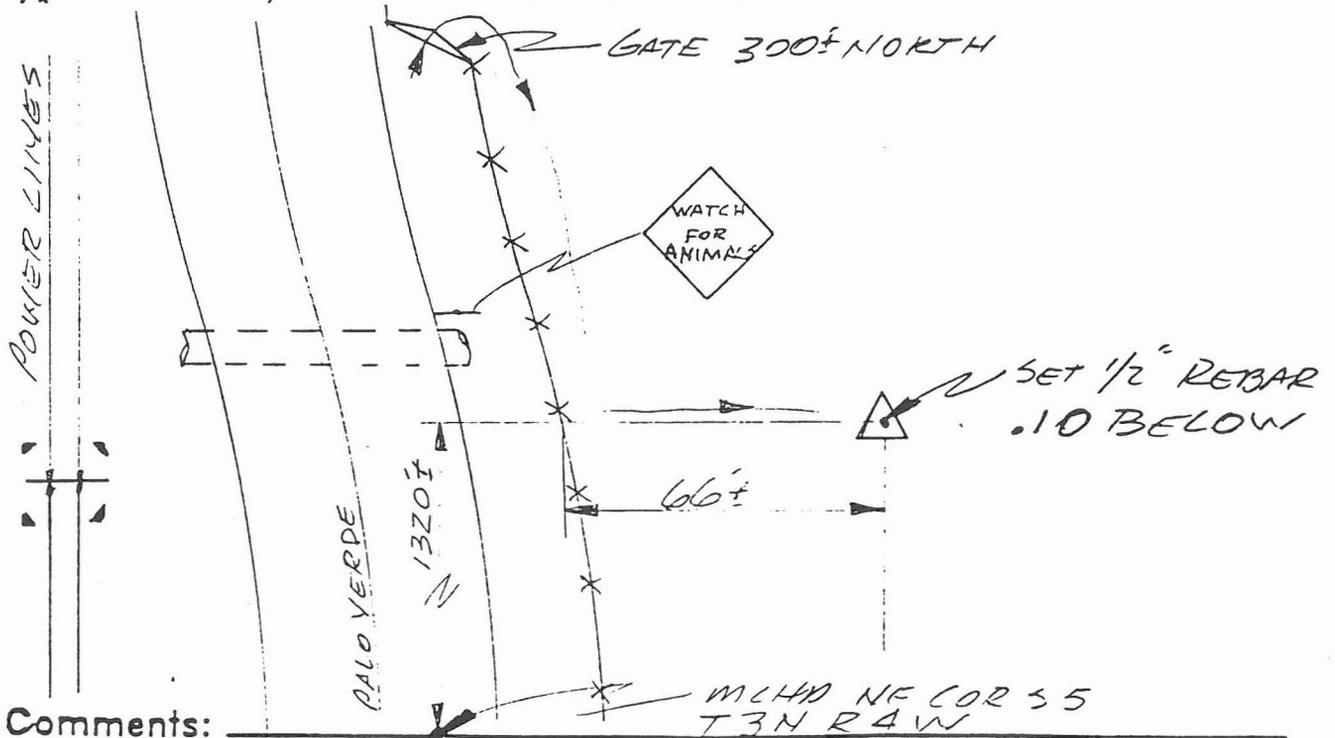
M.S.L. Elevation _____ Z _____

Vert. Datm Ref. _____

Location Sketch and Description

Date 9-24-91 Project WHITE TANKS WASH

Type of Mark 1/2" R.B. Condition GOOD



Comments: _____

MGPS Inc

Adjusted Position Sta.(name) POLE 842 Sta.# W002

Latitude _____ Coord. Sys. _____

Longitude _____ Ellipsoid _____

Ellipsoidal Height _____ X _____

Geoid Height _____ Y _____

M.S.L. Elevation _____ Z _____

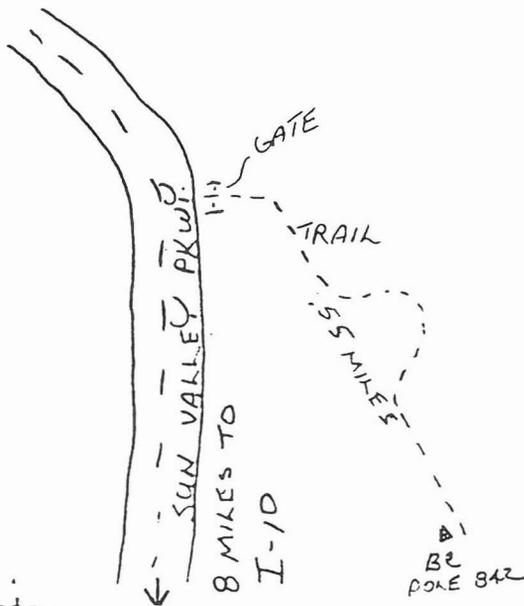
Vert. Datm Ref. _____

Location Sketch and Description

Date 9/24/91 Project WHITE TANK WASH

Type of Mark USCGS BC Condition GOOD
'1947

TWO RMS



Comments: _____

MGPS Inc

Adjusted Position Sta.(name) T2N-R5W N.E. COR. SEC. 14 Sta.# W018

Latitude _____ Coord. Sys. _____

Longitude _____ Ellipsoid _____

Ellipsoidal Height _____ X _____

Geoid Height _____ Y _____

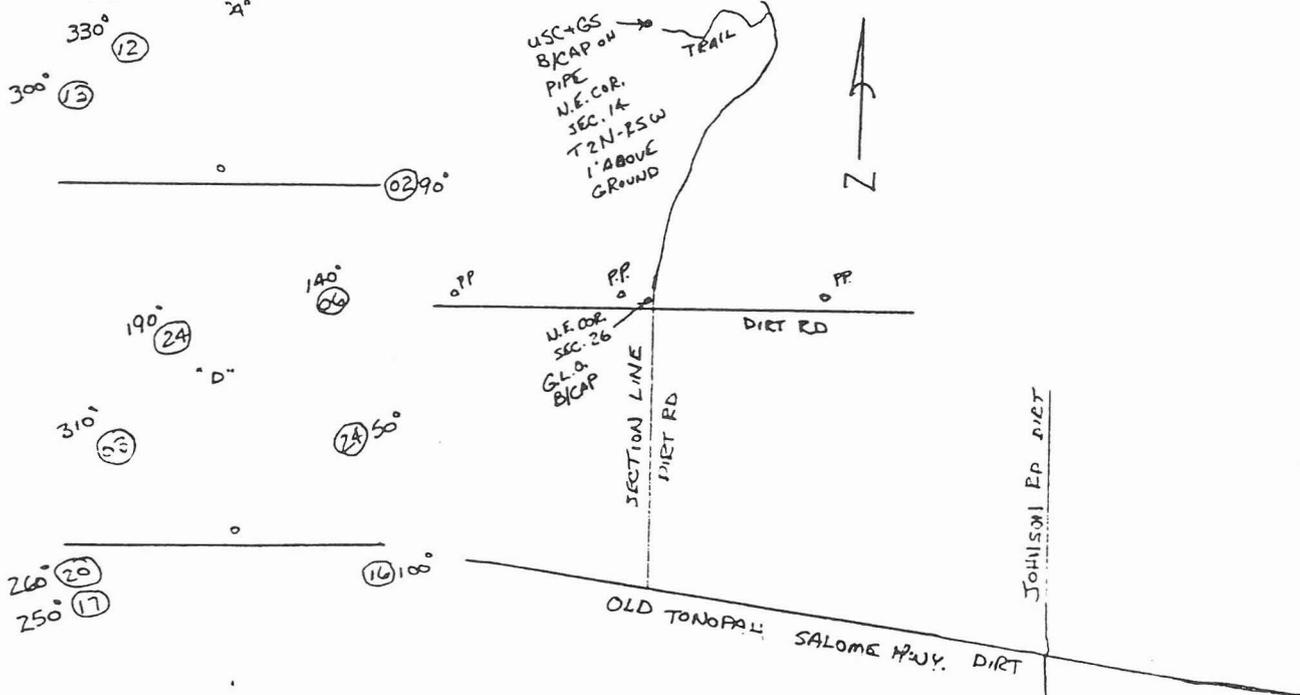
M.S.L. Elevation _____ Z _____

Vert. Datm Ref. _____

Location Sketch and Description

Date 9/24/91 Project WHITE TANKS WASH

Type of Mark G.L.O. B/CAP Condition GOOD



Comments: _____

MGPS Inc

Adjusted Position Sta.(name) NECOR 52 T2N R5W Sta.# W1024

Latitude _____ Coord. Sys. _____

Longitude _____ Ellipsoid _____

Ellipsoidal Height _____ X _____

Geoid Height _____ Y _____

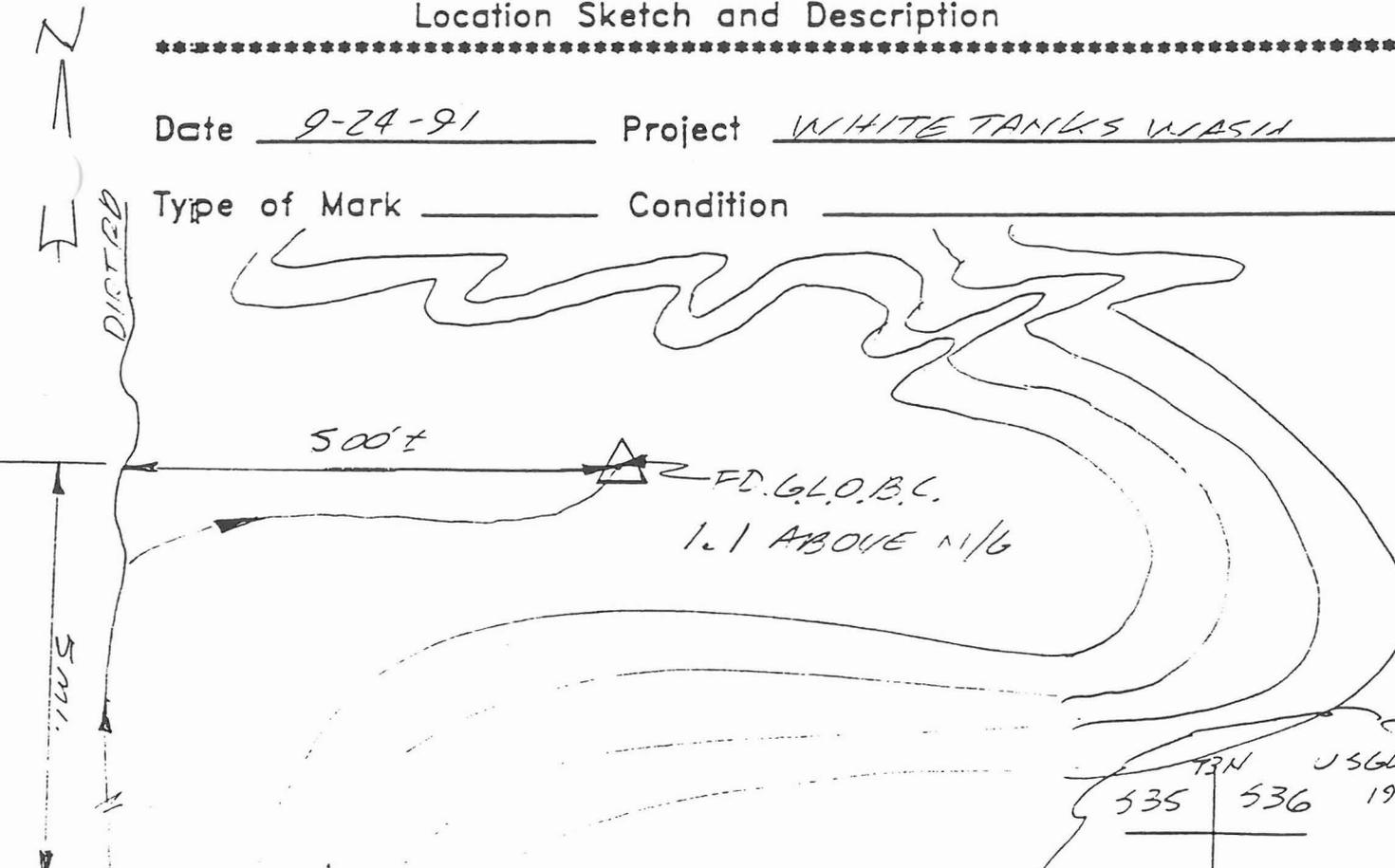
M.S.L. Elevation _____ Z _____

Vert. Datm Ref. _____

 Location Sketch and Description

Date 9-24-91 Project WHITE TANKS WASH

Type of Mark _____ Condition _____



Comments: _____

T2N R5W SALONNE HWY

MGPS Inc

Adjusted Position Sta.(name) W023 Sta.# _____

Latitude _____ Coord. Sys. _____

Longitude _____ Ellipsoid _____

Ellipsoidal Height _____ X _____

Geoid Height _____ Y _____

M.S.L. Elevation _____ Z _____

Vert. Datm Ref. _____

Location Sketch and Description

Date 9/24/91 Project WHITE TANK WASH ADMS

Type of Mark 1/2" REBAR Condition NEW

NO ADEQUATE TERRAIN FEATURES
TO DESCRIBE. STATION IS 0.25 MI.
DUE NORTH OF N 1/4 S6, T2N, R4W
WHERE A USGLO BC WAS FOUND.
SET 8.5' SAGUARO RIB 1.5' INTO
GROUND 6' ± WEST OF STATION.

Comments: _____

MGPS Inc

Adjusted Position Sta.(name) HASSA Sta.# W001

Latitude _____ Coord. Sys. _____

Longitude _____ Ellipsoid _____

Ellipsoidal Height _____ X _____

Geoid Height _____ Y _____

M.S.L. Elevation _____ Z _____

Vert. Datm Ref. _____

Location Sketch and Description

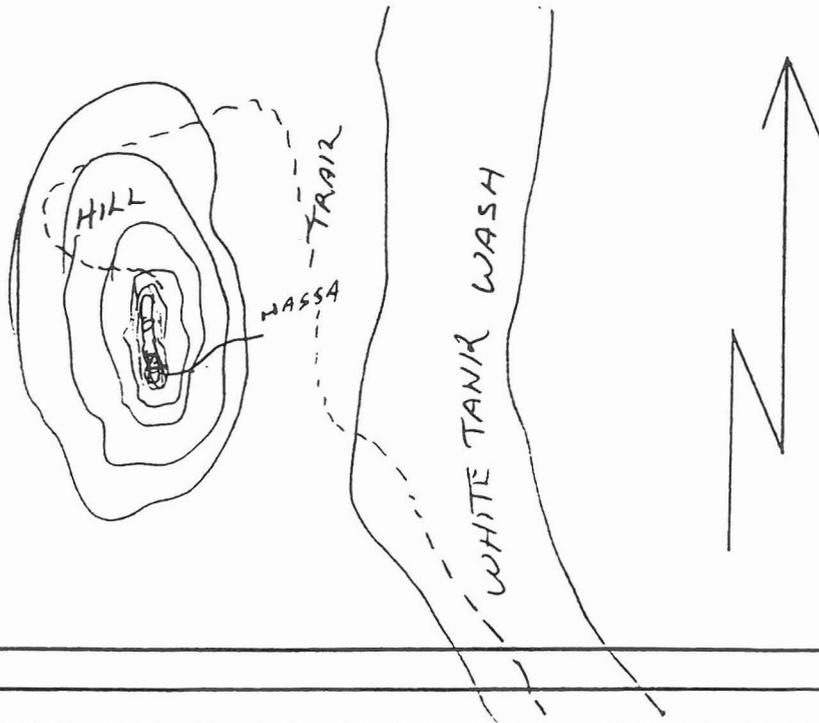
Date 9/24/91 Project WHITE TANK WASH

Type of Mark USCGS BC Condition GOOD
'1947

TWO RMS

#1 RM 18'± SE

#2 RM 20'± NW



Comments: _____

DAILY REPORT

Operator	Station	Description	Receiver
WHITE TANK WASH ADMS 25 September, 1991 DAY 268			
SESSION A (STATIC)			
Dave	W015	NE COR. S32, T2N,R4W MCHD BC IN HH 0.80' BELOW PVMT. SUN VALLEY PKWY. 2.7 MI. N. OF I-10	1
Jerry	W005	STATION "DEAD" (USC&GS) DRILL HOLE IN ROCK (BC DESTROYED) SEE DESCRIPTION	2
Woody	W007	ECC. N 1/4 S18, T1N,R4W SET 1/2" RB FLUSH SEE DESCRIPTION	3
Brian	W006	NE COR. S17, T1N,R4W MCHD BC FLUSH PALO VERDE RD. & YUMA RD.	4
SESSION B (STATIC)			
Dave	W015	NE COR. S32, T2N,R4W MCHD BC IN HH 0.80' BELOW PVMT. SUN VALLEY PKWY. 2.7 MI. N. OF I-10	1
Jerry	W013	NE COR. S36, T2N,R5W USGLO BC 0.60' BELOW GRND. SEE DESCRIPTION	2
Woody	W014	NE COR. S31, T2N,R4W USGLO BC 0.47' ABOVE GRND. SEE DESCRIPTION	3
Brian	W021	NE COR. S17, T2N,R4W MCHD BC IN HH 0.54' BELOW PVMT. SUN VALLEY PKWY. 5.7 MI. N. OF I-10	4
SESSION C (STATIC)			
Dave	W016	ECC. E 1/4 S23, T2N,R5W SET 1/2" REBAR FLUSH SEE DESCRIPTION	1
Jerry	W013	NE COR. S36, T2N,R5W USGLO BC 0.60' BELOW GRND. SEE DESCRIPTION	2
Woody	W011	PANEL POINT SET 1/2" REBAR FLUSH SEE DESCRIPTION	3
Brian	W012	ECC. NE COR. S35, T1N,R5W SET 1/2" REBAR FLUSH SEE DESCRIPTION	4
SESSION D (STATIC)			
Dave	W009	NE COR. S10, T1N,R5W USGLO BC ?.'??' ABOVE GRND. SEE DESCRIPTION	1
Jerry	W004	STATION "GLO C 2" (USC&GS) STD. USC&GS DISK SEE DESCRIPTION	2
Woody	W011	PANEL POINT SET 1/2" REBAR FLUSH SEE DESCRIPTION	3
Brian	W017	E 1/4 S22, T2N,R5W	4

SESSION E (STATIC)

Dave	W009	NE COR. S10, T1N,R5W USGLO BC ?.'?' ABOVE GRND. SEE DESCRIPTION	1
Jerry	W010	NE COR. S11, T1N,R5W USGLO BC 1.1' ABOVE GRND. SEE DESCRIPTION	2
Woody	W007	ECC. N 1/4 S18, T1N,R4W SET 1/2" RB FLUSH SEE DESCRIPTION	3
Brian	W008	NE COR. S14, T1N,R5W USGLO BC ?.'?' ABOVE GRND. SEE DESCRIPTION	4

MGPS Inc

Adjusted Position Sta.(name) TIN-R5W N.E. COR. SEC. 11 Sta.# W010

Latitude _____ Coord. Sys. _____

Longitude _____ Ellipsoid _____

Ellipsoidal Height _____ X _____

Geoid Height _____ Y _____

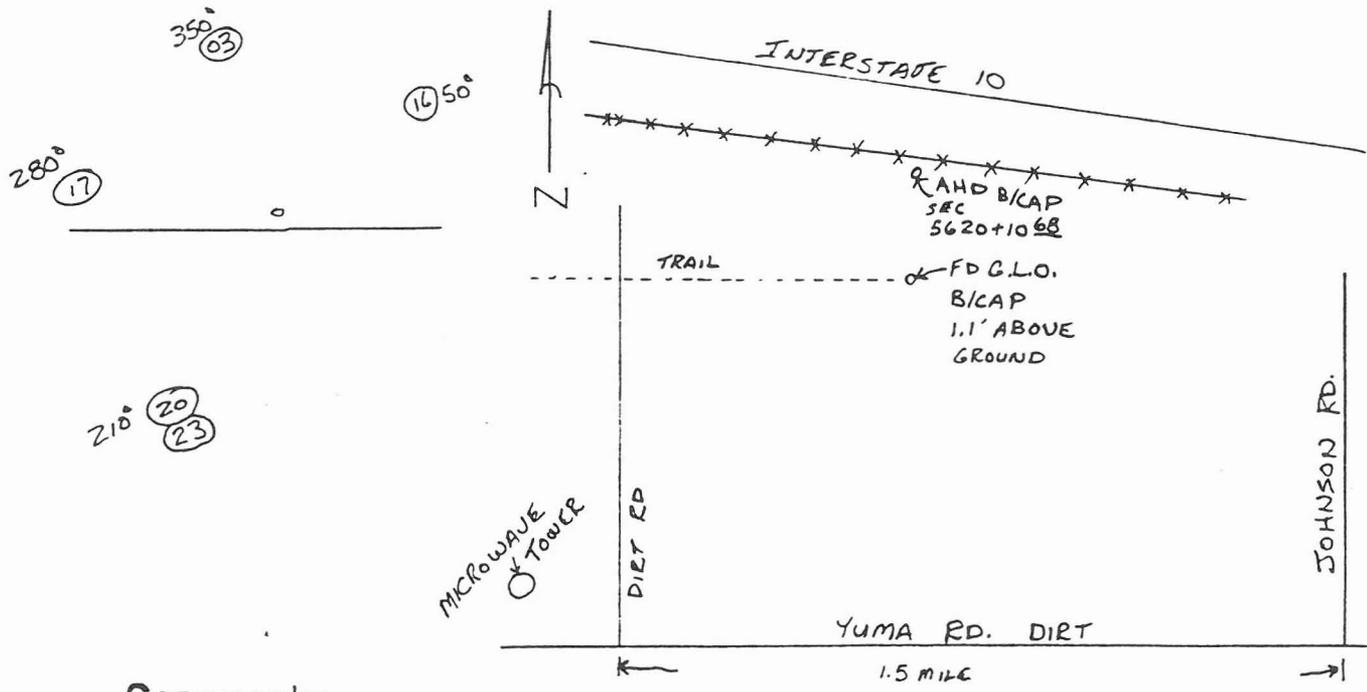
M.S.L. Elevation _____ Z _____

Vert. Datm Ref. _____

Location Sketch and Description

Date 9/25/91 Project WHITE TANKS WASH

Type of Mark G.L.O. B/CAP Condition GOOD



Comments: _____

MGPS Inc

Adjusted Position Sta.(name) NE 314, TIN, R5W Sta.# W008

Latitude _____ Coord. Sys. _____

Longitude _____ Ellipsoid _____

Ellipsoidal Height _____ X _____

Geoid Height _____ Y _____

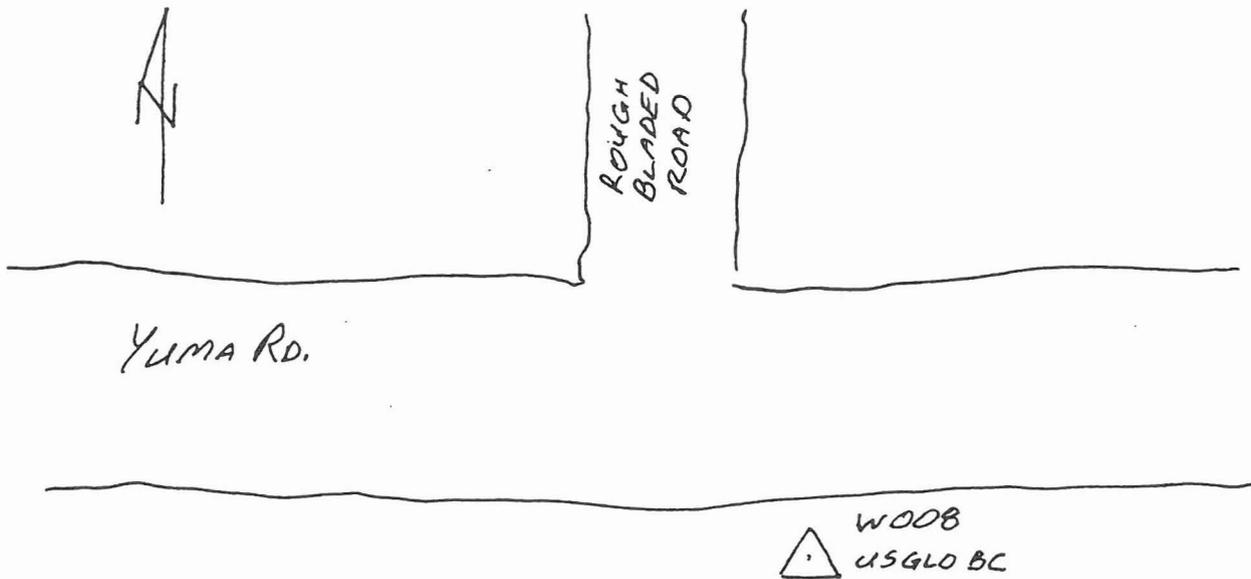
M.S.L. Elevation _____ Z _____

Veri. Datm Ref. _____

Location Sketch and Description

Date 9/25/91 Project WHITE TANK WASH ADMS

Type of Mark U.S.G.L.O.BC Condition GOOD



Comments: STATION IS 1.0 MI. WEST OF JOHNSON RD.

MGPS Inc

Adjusted Position Sta.(name) TIN-RSW TRF STA. 310=C Sta.# W004

Latitude _____ Coord. Sys. _____

Longitude _____ Ellipsoid _____

Ellipsoidal Height _____ X _____

Geoid Height _____ Y _____

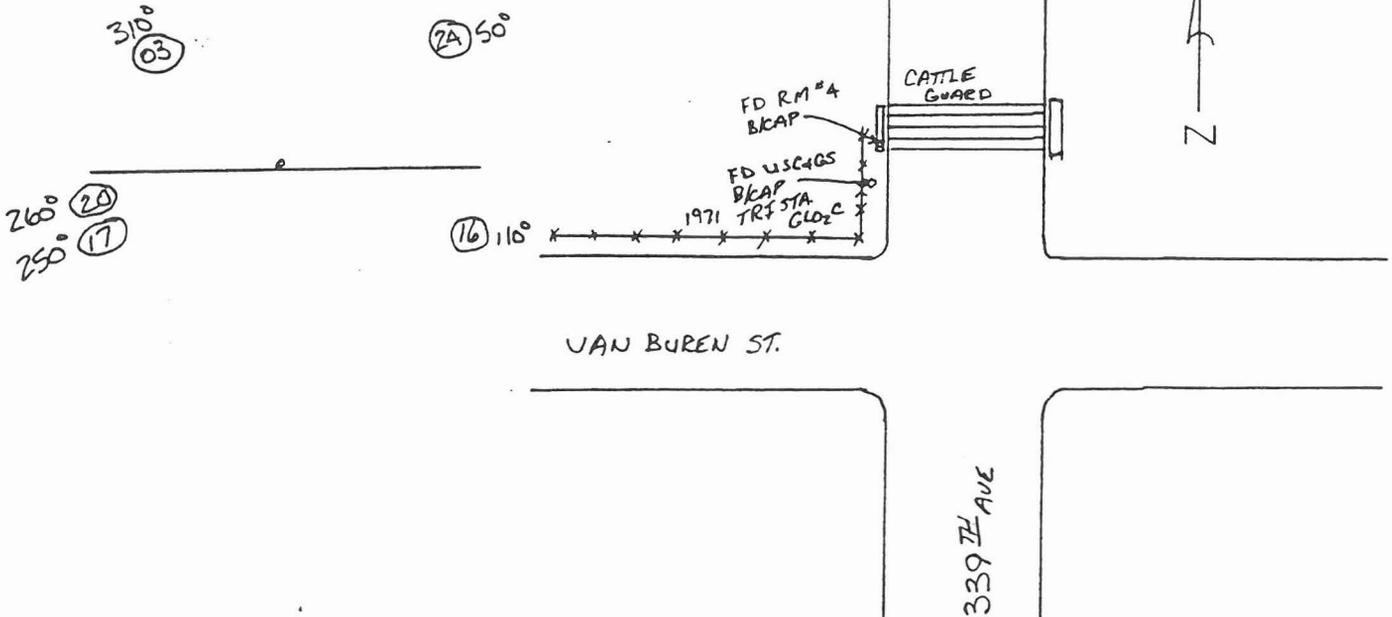
M.S.L. Elevation _____ Z _____

Vert. Datm Ref. _____

Location Sketch and Description

Date 9/25/91 Project WHITE TANKS WASH

Type of Mark USC&GS, BKAP Condition GOOD



Comments: _____

MGPS Inc

Adjusted Position Sta.(name) N1E COR 5 10
TIN R SW Sta.# W009

Latitude _____ Coord. Sys. _____

Longitude _____ Ellipsoid _____

Ellipsoidal Height _____ X _____

Geoid Height _____ Y _____

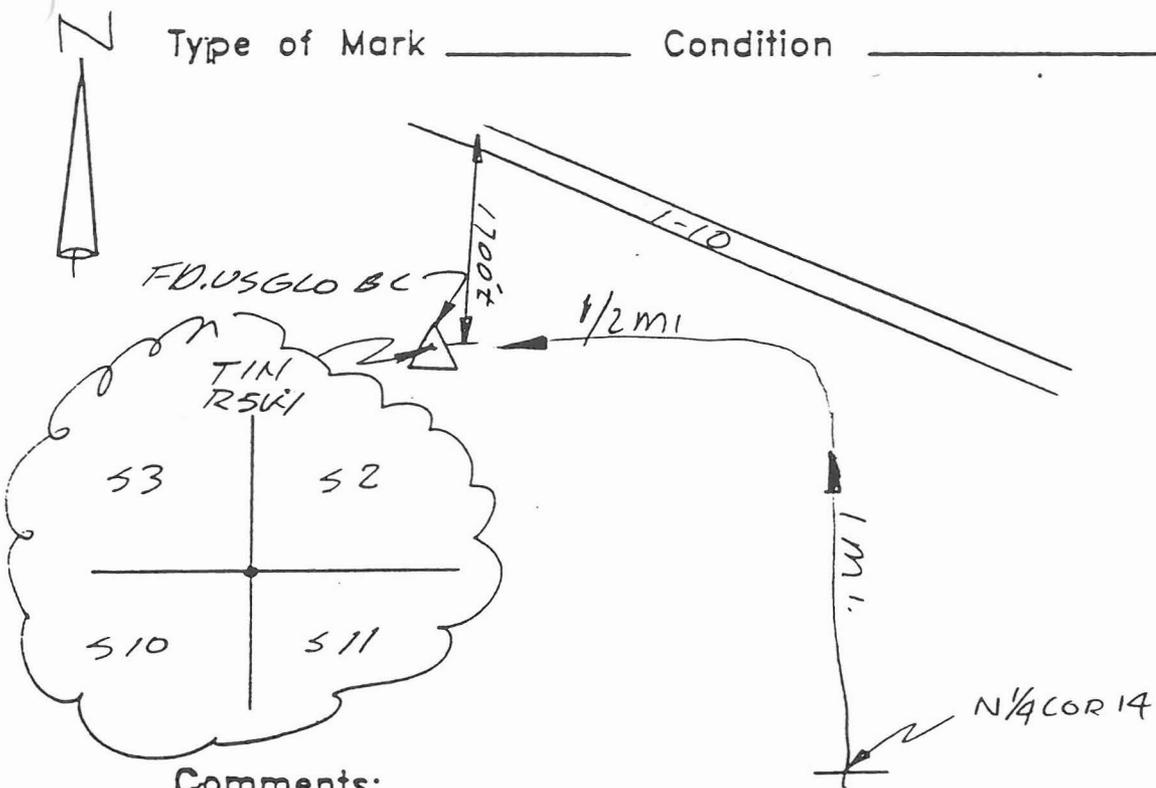
M.S.L. Elevation _____ Z _____

Vert. Datm Ref. _____

Location Sketch and Description

Date _____ Project _____

Type of Mark _____ Condition _____



Comments: _____

MGPS Inc

Adjusted Position Sta.(name) E 1/4 S22, T2N, R5W Sta.# W017

Latitude _____ Coord. Sys. _____

Longitude _____ Ellipsoid _____

Ellipsoidal Height _____ X _____

Geoid Height _____ Y _____

M.S.L. Elevation _____ Z _____

Vert. Datm Ref. _____

Location Sketch and Description

Date 9/25/91 Project WHITE TANK WASH ADMS

Type of Mark 1/2" RB W/PL. CAP Condition FAIR

NO ADEQUATE TERRAIN FEATURES TO DESCRIBE.
THE STATION IS 0.5 MI. NORTH OF A BRASSCAP
MARKED $\begin{array}{r} 22 | 23 \\ 27 | 26 \end{array}$, 1000' ± WEST OF THE
HASSAYAMPA RIVER.

Comments: STA. IS 1/2" RB W/PLASTIC CAP R.L. FANNIN L.S. # 14177

MGPS Inc

Adjusted Position Sta.(name) RP 41016 Sta.# 41016

Latitude _____ Coord. Sys. _____

Longitude _____ Ellipsoid _____

Ellipsoidal Height _____ X _____

Geoid Height _____ Y _____

M.S.L. Elevation _____ Z _____

Vert. Datm Ref. _____

Location Sketch and Description

Date 9-25-01 Project WHITE TANKS W/ASH

Type of Mark RB. Condition GOOD

SEE PREVIOUS DWG

Comments: _____

MGPS Inc

Adjusted Position Sta.(name) pp w011 Sta.# w011

Latitude _____ Coord. Sys. _____

Longitude _____ Ellipsoid _____

Ellipsoidal Height _____ X _____

Geoid Height _____ Y _____

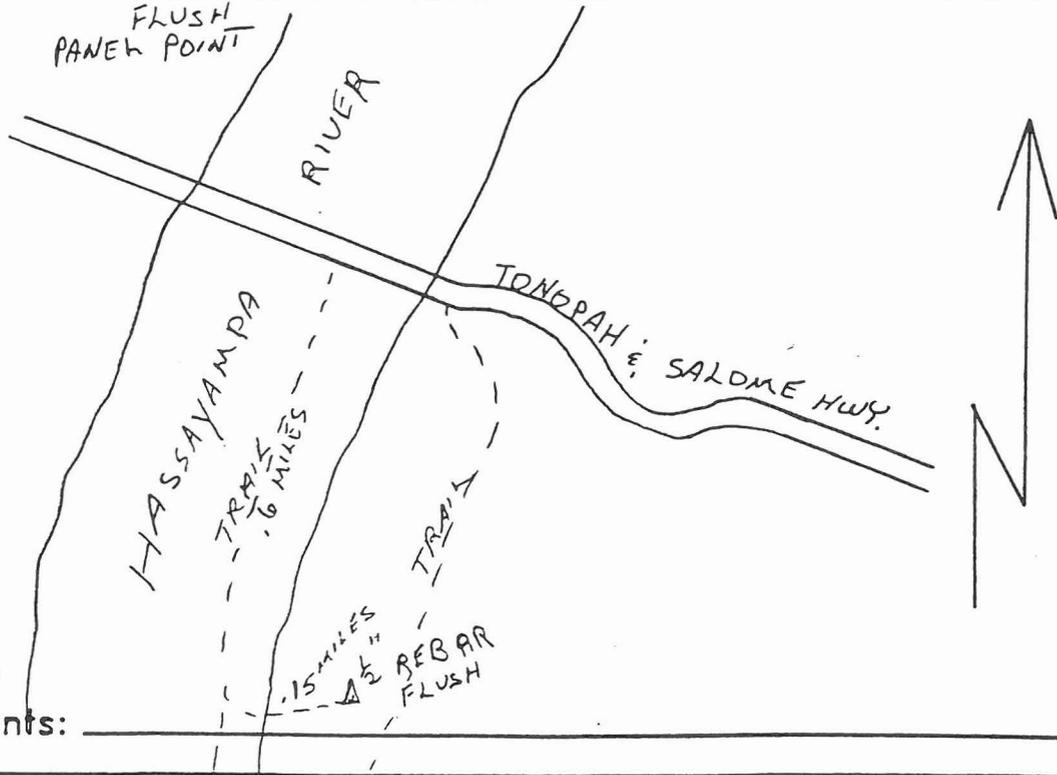
M.S.L. Elevation _____ Z _____

Vert. Datm Ref. _____

Location Sketch and Description

Date 9/25/91 Project WHITE TANK WASH

Type of Mark SET 1/2" REBAR Condition GOOD



Comments: _____

MGPS Inc

Adjusted Position Sta.(name) ^{ECC.} NE 35, T1N, R5W Sta.# W012

Latitude _____ Coord. Sys. _____

Longitude _____ Ellipsoid _____

Ellipsoidal Height _____ X _____

Geoid Height _____ Y _____

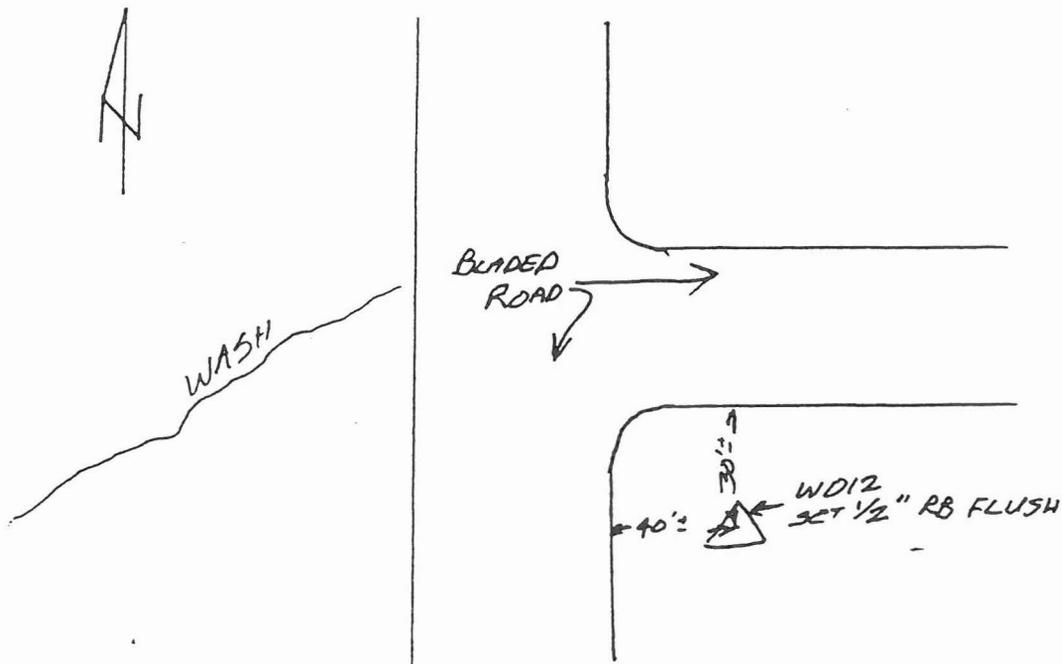
M.S.L. Elevation _____ Z _____

Vert. Datm Ref. _____

Location Sketch and Description

Date 9/25/91 Project WHITE TANK WASH ADMS

Type of Mark 1/2" RB Condition NEW



Comments: STA. IS 300'± N. OF TONOPAH-SALOME HWY.,
3 MI. WEST OF SUN VALLEY PKWY.

MGPS Inc

Adjusted Position Sta.(name) T2N-R5W N.E.COR. SEC.36 Sta.# W013

Latitude _____ Coord. Sys. _____

Longitude _____ Ellipsoid _____

Ellipsoidal Height _____ X _____

Geoid Height _____ Y _____

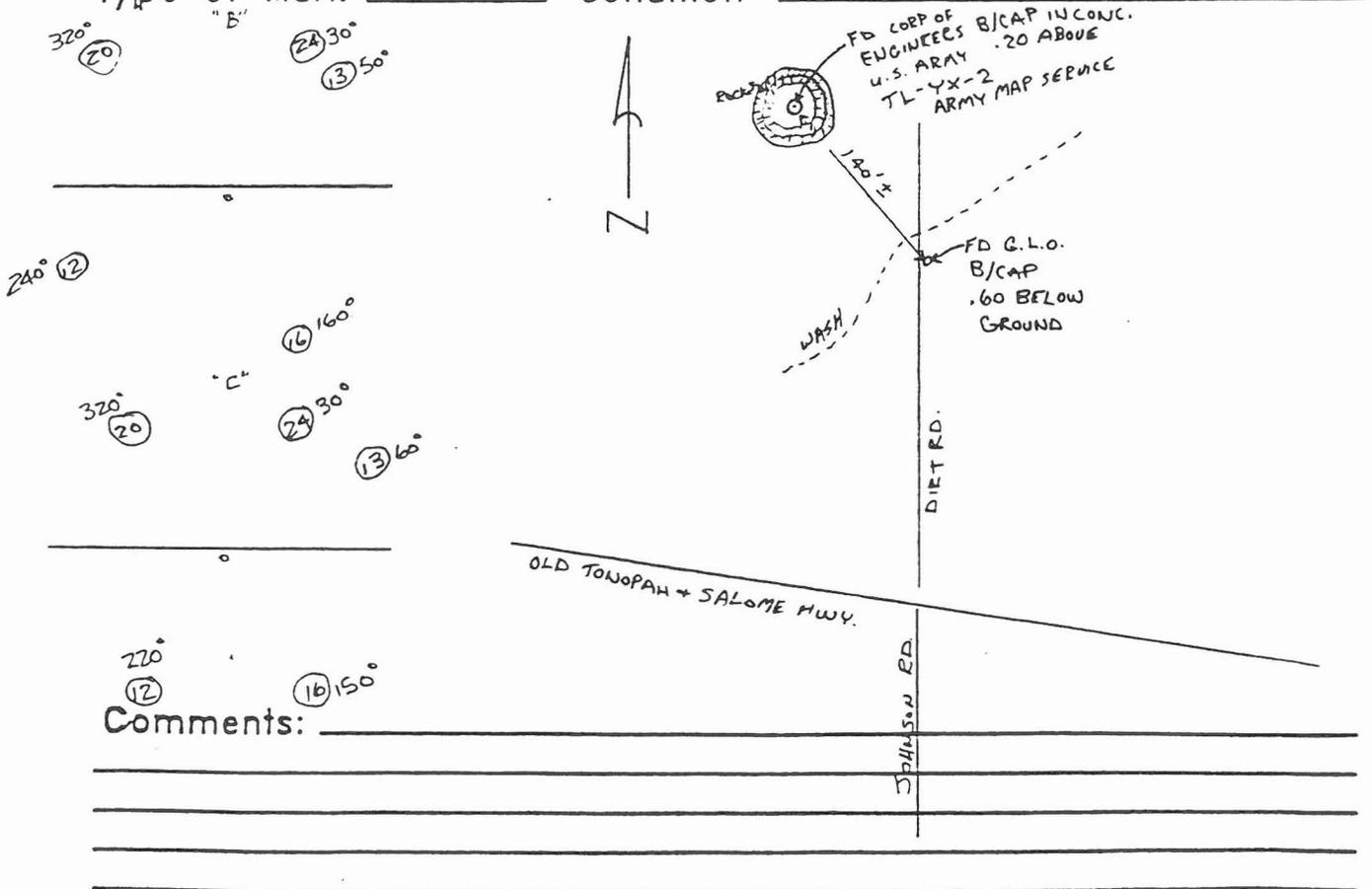
M.S.L. Elevation _____ Z _____

Vert. Datm Ref. _____

 Location Sketch and Description

Date 9/25/91 Project WHITE TANKS WASH

Type of Mark G.L.O. B/CAP Condition GOOD



MGPS Inc

Adjusted Position Sta.(name) NEBITZ-N-RAW Sta.# W014

Latitude _____ Coord. Sys. _____

Longitude _____ Ellipsoid _____

Ellipsoidal Height _____ X _____

Geoid Height _____ Y _____

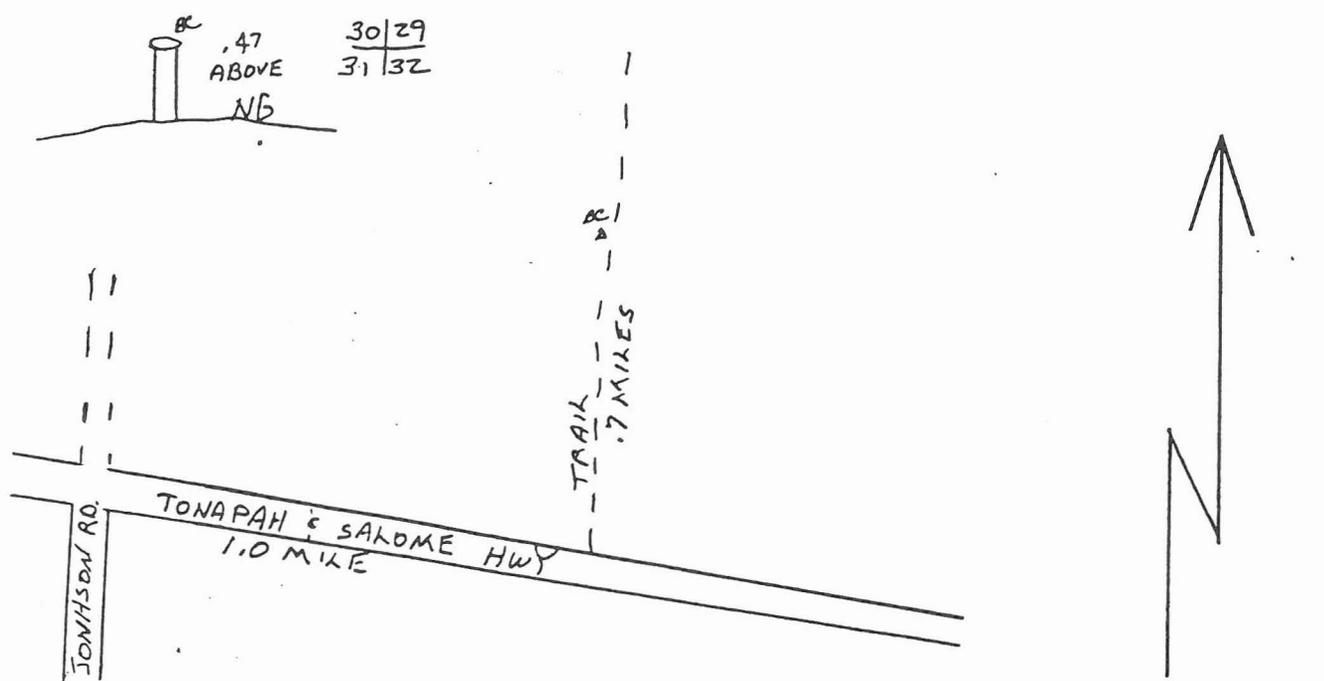
M.S.L. Elevation _____ Z _____

Vert. Datm Ref. _____

Location Sketch and Description

Date 9/21/91 Project WHITE TANK WASH

Type of Mark GLOBE Condition GOOD



Comments: _____

MGPS Inc

Adjusted Position Sta.(name) NE17, T2N, R4E Sta.# W021

Latitude _____ Coord. Sys. _____

Longitude _____ Ellipsoid _____

Ellipsoidal Height _____ X _____

Geoid Height _____ Y _____

M.S.L. Elevation _____ Z _____

Vert. Datm Ref. _____

Location Sketch and Description

Date 9/25/91 Project WHITE TANK WASH ADMS

Type of Mark MCHD BC IN HH Condition GOOD



SUN VALLEY ARWAY
(PALO VERDE RO.)

W021
MCHD BC IN HH
0.54' BELOW PVMT,

Comments: STA IS 5.7 MI ± NORTH OF I-10

MGPS Inc

Adjusted Position Sta.(name) TRI STA DEAD Sta.# W005

Latitude _____ Coord. Sys. _____

Longitude _____ Ellipsoid _____

Ellipsoidal Height _____ X _____

Geoid Height _____ Y _____

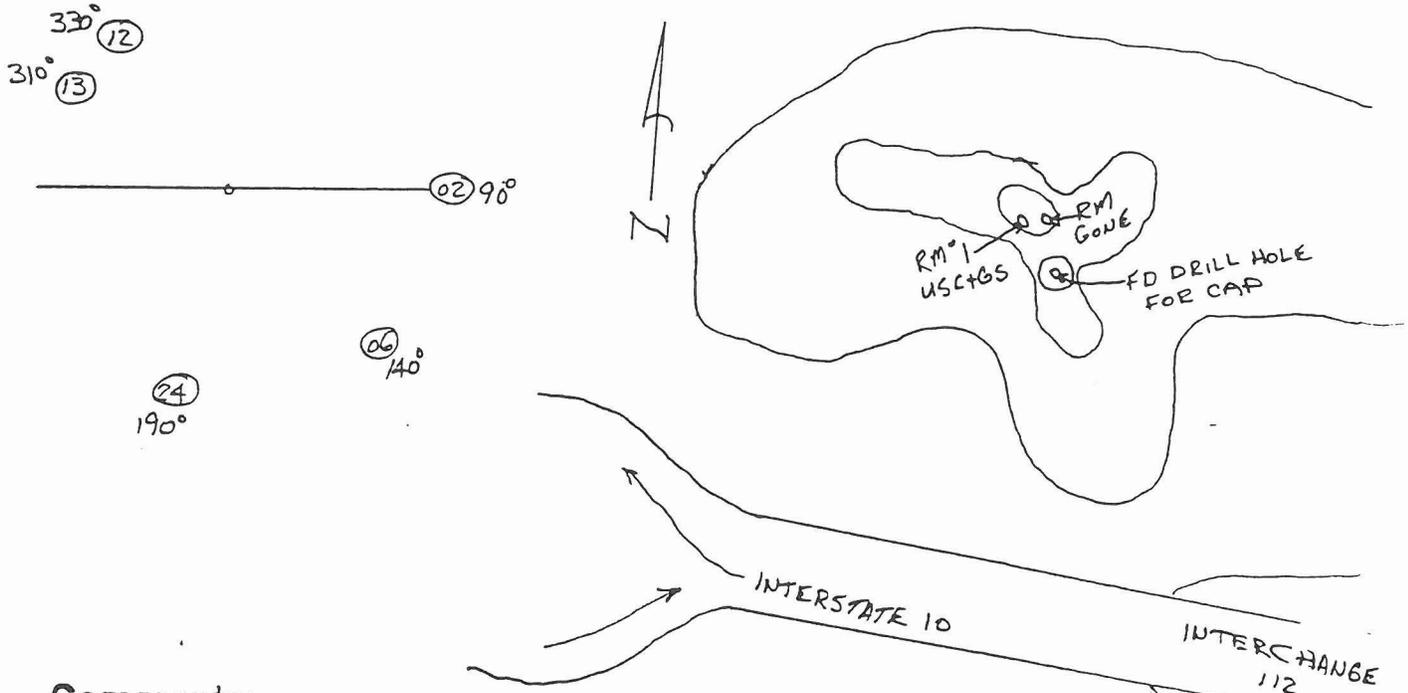
M.S.L. Elevation _____ Z _____

Vert. Datm Ref. _____

Location Sketch and Description

Date 9/25/91 Project WHITE TANKS WASH

Type of Mark DRILLHOLE Condition _____



Comments: _____
THE ROCK THAT THE CAP WAS IN HAD BEEN
CHISELED OFF ONE SIDE. THE DRILL HOLE WAS
VISIBLE.

MGPS Inc

Adjusted Position Sta.(name) MECOR 532 TZNR4W Sta.# V1015

Latitude _____ Coord. Sys. _____

Longitude _____ Ellipsoid _____

Ellipsoidal Height _____ X _____

Geoid Height _____ Y _____

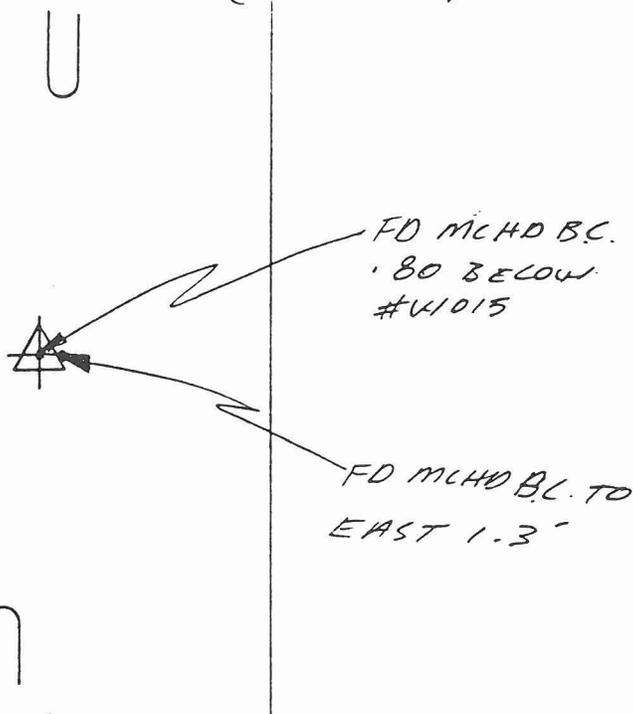
M.S.L. Elevation _____ Z _____

Vert. Datm Ref. _____

Location Sketch and Description

Date 9-25-91 Project WHITE TANKS WASH

Type of Mark MCHD BC Condition GOOD (NOT LEVEL)



Comments: _____

MGPS Inc

Adjusted Position Sta.(name) PP W007 Sta.# W007

Latitude _____ Coord. Sys. _____

Longitude _____ Ellipsoid _____

Ellipsoidal Height _____ X _____

Geoid Height _____ Y _____

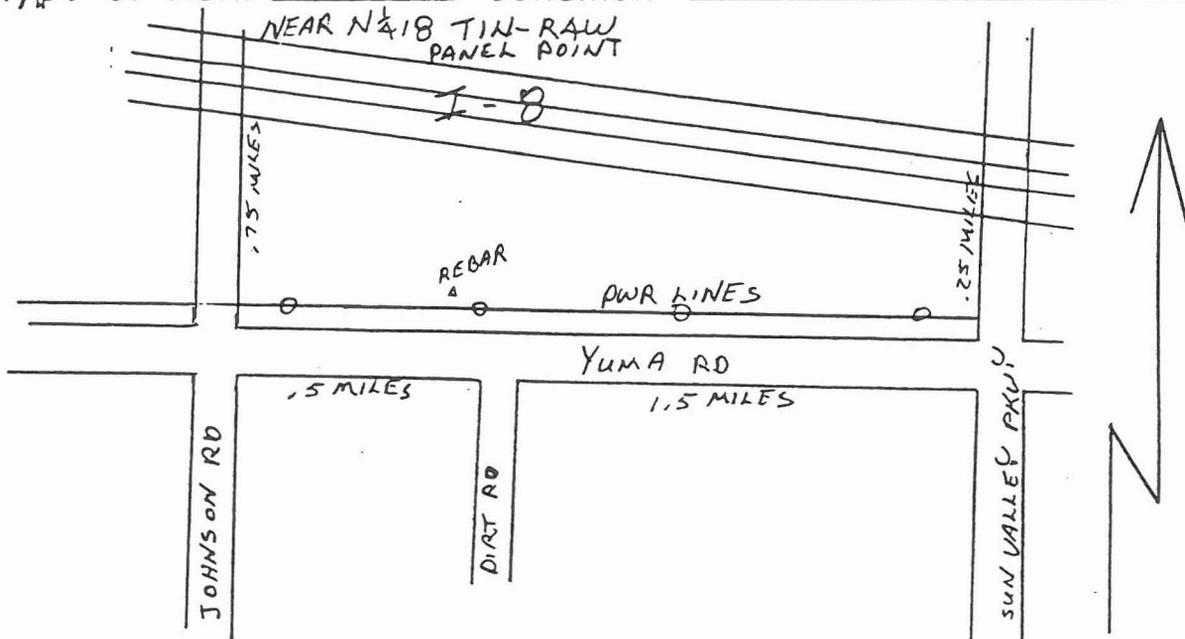
M.S.L. Elevation _____ Z _____

Vert. Datm Ref. _____

Location Sketch and Description

Date 9/25/91 Project WHITE TANK WASH

Type of Mark FLUSH SET $\frac{1}{2}$ " REBAR Condition GOOD



Comments: $\frac{1}{2}$ " REBAR IS LOCATED $65 \pm$ NORTH OF $\frac{1}{2}$ YUMA RD
 $27 \pm$ HW OF PP # 5

MGPS Inc

Adjusted Position Sta.(name) NE 17, TIN, R 4E Sta.# W006

Latitude _____ Coord. Sys. _____

Longitude _____ Ellipsoid _____

Ellipsoidal Height _____ X _____

Geoid Height _____ Y _____

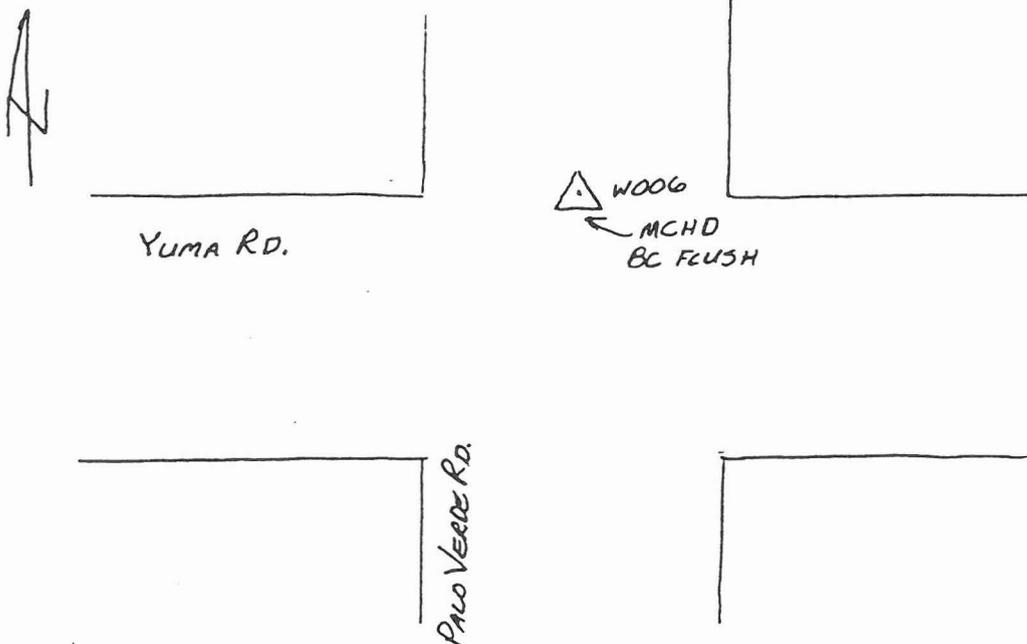
M.S.L. Elevation _____ Z _____

Vert. Datm Ref. _____

Location Sketch and Description

Date 9/25/91 Project WHITE TANK WASH ADMS

Type of Mark MCHD B.C. Condition FAIR



Comments: STA. IS 0.3 MI. SOUTH OF I-10

HORIZONTAL CONTROL DATA

by the
 Coast and Geodetic Survey
 NORTH AMERICAN 1927 DATUM

QUAD 331123 STATION 1005
 ARIZ
 LATITUDE 33°00' TO 33°30'
 LONGITUDE 112°30' TO 113°00'
 DIAGRAM NI 12-7 PHOENIX

COAST AND GEODETIC SURVEY
 RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: "C" (GLO)
 ESTABLISHED BY: E. B. L. YEAR: 1934 STATE: Arizona
 RECOVERED BY: C. A. A. YEAR: 1962 COUNTY: Maricopa

OBJECT	BEARING	DISTANCE		DIRECTION
		FEET	METERS	
BM 33 1947	SSE	50.10	15.272	00 00 00.00
R. M. No. 2	S	approx. 0.7 miles	89 46 48.4	
Azimuth mark	S	91.36	27.846	163 59 01.2
R. M. No. 1	E	approx. 10 miles	359 59 06.3	
Los Angeles-Phoenix Airway Beacon No. 33 1947				

The station mark, reference mark 1 and reference mark 2 was recovered and found to be in good condition, the azimuth mark had been destroyed and a new azimuth mark was established at this time. The distance and direction to reference mark 1 and reference mark 2 checked. Due to changes a complete new description follows:

The station is located about 10 miles east-southeast of Tonopah, about 8 miles north of Hassayampa and about 3 miles south of the Tonopah-Perryville Road.

To reach the station from the post office in Tonopah, go east on the bladed road for 8.8 miles to a crossroad and sign (Perryville 20 miles, Hassayampa 12 miles), turn right and go south on bladed road for 3.0 miles to a side road right and sign (West Van Buren St., Wickenburg Rd.), turn left on south side of fence and go east for 0.1 mile to fence corner and station.

To reach the azimuth mark from the sign (West Van Buren St., Wickenburg Rd.), continue south for 0.7 mile to the azimuth mark on right, as described.

Station mark, a General Land Office Survey mark, is a 1 1/2 inch iron pipe with cap on top which is reinforced with concrete and is stamped T1N, R5W, S5, S4, S8, S9, 1915. The mark is 28 feet south of the center of a track road, 17.5 feet south-southwest of fence corner and 4 feet west of fence corner.

Reference mark 1, a standard reference disk set in a drill hole in a small boulder which projects about 2 inches and is stamped G.L.O.C. NO 1 1934. The mark is 101 feet southwest of fence corner and 43 feet south of center of a track road. Reference mark 2, a standard reference disk set in a drill hole in a small boulder which projects about 2 inches and is stamped G.L.O.C. NO 2 1934. The mark is 49 feet south-southeast of fence corner and 14.6 feet east of fence.

Azimuth mark, a standard azimuth disk set in the top of a 12 inch square concrete post which projects about 6 inches and is stamped G.L.O.C. 1934 RESET 1962. The mark is 18 feet east-southeast of the center of road, 2.8 feet north-northwest of the witness post and 1.3 feet west of the fence.

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: "C" (GLO)
 ESTABLISHED BY: E. B. L. YEAR: 1934 STATE: Arizona BENCH MARK ALSO
 RECOVERED BY: D. J. Florwick YEAR: 1965 COUNTY: Maricopa
 AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN:
 HEIGHT OF TELESCOPE ABOVE STATION MARK FEET. HEIGHT OF LIGHT ABOVE STATION MARK FEET.

OBJECT	BEARING	DISTANCE		DIRECTION
		FEET	METERS	
ROCKY 1947				
Los Angeles-Phoenix Airway Beacon No. 33				
BM 33 1947				
Azimuth mark (0.35 mile)	S			
RM 1	SW	91.37	27.846	241 41 10
C (GLO) 2		(75.38)	22.976	317 10 14.6
RM 4	ENE	(77.44)	23.606	337 27 40.4

The station mark, reference mark No. 1, reference mark No. 2 and the azimuth mark were recovered and found to be in good condition. However, errors were noted in the local measurements in the 1962 description. The corrected description follows:

The station is located about 10 miles east-southeast of Tonopah, 8 miles north of Hassayampa and 3.0 miles south of the Tonopah-Perryville road.

To reach the station from the U.S. Post Office in Tonopah, go east on an asphalt road for 0.2 mile to the end of the pavement.

Continue east on graveled road for 8.6 miles to a crossroad and sign, "Hassayampa 12 miles." Turn right and go south on graveled road for 3.0 miles to a side road on the right and sign, "West Van Buren Street, Wickenburg Road." Turn left and go east along south side of fence for 0.1 mile to the station mark.

To reach the azimuth mark from the sign, "West Van Buren Street, Wickenburg Road," go south along graveled road for 0.75 mile to the mark on the right.

The station mark is a General Land Office Survey mark composed of a 1-1/2 inch iron pipe with a cap on top and reinforced with concrete. The cap is stamped T1N, R5W, S5, S4, S8, S9, 1915. It is 28 feet south-southwest of a fence corner, 17.5 feet south of the center of a track road and 4 feet west of another fence corner.

Reference mark No. 1 is a standard disk, stamped G.L.O.C. 1934 NO 1, cemented in a drill hole in the top of a small boulder that projects 2 inches above the surface of the ground. It is 101 feet west-west of a fence corner and 43 feet south of the center of a track road.

Reference mark No. 2 is a standard disk, stamped G.L.O.C. 1934 NO 2, cemented in a drill hole in the top of a small boulder that projects about 2 inches above the surface of the ground. It is 49 feet south-southeast of a fence corner and 14.6 feet east of a fence.

The azimuth mark is a standard disk, stamped G.L.O.C. 1934 RESET 1962, set in the top of a 12-inch square concrete post that projects 6 inches above the surface of the ground. It is 18 feet west-southwest of the center of the graveled road, 2.8 feet west-northwest of a metal witness post and 1.3 feet west-southwest of a wire fence.

The station was not occupied at this time.
 RECOVERY OF SURVEY STATION

AREAL	DESIGNATION OF STATION	TYPE OF MARK
MARICOPA COUNTY	C GLO	
ARIZONA		
QUAD:	STAMPING ON MARK:	CONDITION:
ACKLERN		NOT FOUND
TOWN:	AGENCY (EAST W. MARK):	POS. BY (AGENCY):
BUCKEYE		USCPS JAN 1962

ADDITIONS AND/OR REVISIONS TO DESCRIPTION OR BEARING:
 STA. WAS NOT FOUND
 STA. PROBABLY DESTROYED BY ROAD CONSTRUCTION
 RM # 1 FOUND IN GOOD CONDITION. DIST. TO
 STA. FROM RM # 1 INDICATES STA. WAS LOCATED
 IN CENTERLINE OF NEW ROAD.

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: C (GLO)
 ESTABLISHED BY: E. B. L. YEAR: 1934 STATE: Arizona BENCH MARK ALSO
 RECOVERED BY: L. F. Smith YEAR: 1971 COUNTY: Maricopa
 AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN: 6 miles north of Hassayampa
 HEIGHT OF TELESCOPE ABOVE STATION MARK 5 FEET. HEIGHT OF LIGHT ABOVE STATION MARK 5 FEET.

OBJECT	BEARING	DISTANCE		DIRECTION
		FEET	METERS	
ROCKY 1947				
Los Angeles-Phoenix Airway Beacon No. 33				
BM 33 1947				
Azimuth mark (0.35 mile)	S			
RM 1	SW	91.37	27.846	241 41 10
C (GLO) 2		(75.38)	22.976	317 10 14.6
RM 4	ENE	(77.44)	23.606	337 27 40.4

Reference mark 1 was recovered and found in good condition. All other marks were destroyed during road construction. The station was reestablished on a temporary point using the distance to reference mark 1 and angles from the National Net. The temporary point was in a road intersection and was moved to C (GLO) 2 which is nearby.

JULY 1966
 PUBLISHED AND PRINTED BY:
 U. S. DEPARTMENT OF COMMERCE
 COAST AND GEODETIC SURVEY
 WASHINGTON D. C.

HORIZONTAL CONTROL DATA

by the
 Coast and Geodetic Survey
 NORTH AMERICAN 1927 DATUM

QUAD. 331124 STATION 1010
 ARIZ
 LATITUDE 33°30' TO 34°00'
 LONGITUDE 112°30' TO 113°00'
 DIAGRAM NI 12-7 PHOENIX

DEPARTMENT OF COMMERCE
 U. S. COAST AND GEODETIC SURVEY
 FORM 565
 10th Ed. 5-54

DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: **ERDL** STATE: **Arizona** COUNTY: **Maricopa**

CHIEF OF PARTY: **R. L. English** YEAR: **1956** Described by: **K. D. B.**

NOTE	HEIGHT OF TELESCOPE ABOVE STATION MARK METERS	HEIGHT OF LIGHT ABOVE STATION MARK METERS	DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION		
			OBJECT	BEARING	DIRECTION
1b 7a	Surface-station mark, Underground-station mark				
			feet	meters	
11a	POLE 842 1947 - R.H. No. 1	NE	38.99	11.385	00 00 00.00 11 37 36
11a	R.H. No. 2	SE	36.33	11.075	113 06 50

The station is located about 20 miles west-northwest of Litchfield, 16 miles east-northeast of Tonopah and about 14 miles north of Buckeye. It is about 1/2 mile east of a power transmission line and 127 feet east of a dirt road. It is stamped ERDL 1956 and set flush.

Reference mark No. 1 is 165 feet east of the center of a dirt road on the same elevation as the station. It is stamped ERDL NO 1 1956 and projects 2 inches.

Reference mark No. 2 is 135 feet east of the center of a dirt road. It is stamped ERDL NO 2 1956 and projects 2 inches.

Triangulation station POLE 842 1947 will serve as an azimuth mark.

To reach from the City and County building in Buckeye, go west for 0.4 mile to a cross street at the west edge of Buckeye, turn right and go 0.6 miles to a railroad track continue ahead for 1.5 miles to a T-road and the end of the black top, continue ahead for 3.1 miles to a crossroad and transformer station, turn left and go 0.4 miles to a track road right, turn right and go 0.3 mile to a powerline and crossroad, turn left along powerline and go 0.9 mile to a fork, take right fork and follow powerline for 7.8 miles to a fork, take right fork leaving powerline and go 1.2 miles to the station on the right as described.

To reach the azimuth mark from the station, continue ahead for 0.55 mile to another powerline, turn right and go south for 0.55 mile to Triangulation POLE 842 1947 on the right.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: **ERDL**

YEAR: **1956**

STATE: **Ariz.**

LOCALITY: **Southwest Arizona**

First -order Triangulation SOURCE: **G-11970**

FIELD SKETCH: **Ariz 35**

GRID DATA	COORDINATES (Foot)	PLANE AZIMUTH @ 102.563 ANGLE	MARK
STATE: Ariz ZONE: G CODE: 0202	X 268,405.92 Y 927,593.49	213 03 57 - 0 25 12	Azimuth Mark (Pole 842)
STATE: ZONE: CODE:	X Y		

GEODETIC DATA	POSITION		SECONDS IN METERS	ELEVATION METERS FEET
	LATITUDE	LONGITUDE		
	33°32'51"422	112 40 36.475		

TO STATION	GEODETIC AZIMUTH (From south)	DISTANCE	
		LOGARITHM (Distances)	METERS
Azimuth Mark (Pole 842)	212°38'44"59	2. 998 2728	996.03

* Refer to notes in accounts of triangulation and state publications of triangulation. | Direction-angle measured clockwise, referred to initial station.
 | To nearest meter only, when no trigonometric leveling is being done.

JULY 1966
 PUBLISHED AND PRINTED BY:
 U. S. DEPARTMENT OF COMMERCE
 COAST AND GEODETIC SURVEY
 WASHINGTON D. C.

HORIZONTAL CONTROL DATA

by the
 Coast and Geodetic Survey
 NORTH AMERICAN 1927 DATUM

QUAD 331124 STATION 1019
 ARIZ
 LATITUDE 33°30' TO 34°00'
 LONGITUDE 112°30' TO 113°00'
 DIAGRAM NI 12-7 PHOENIX

93

DEPARTMENT OF COMMERCE
 U. S. COAST AND GEODETIC SURVEY
 FORM 536
 Rev. Oct., 1955

DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: POLE 842
 CHIEF OF PARTY: D.H. Konichek
 Surface-station mark, Note, 1a
 Underground-station mark, Note, 7a
 Reference mark, No. 1, Note, 11a
 Reference mark, No. 2, Note, 11a
 Azimuth mark, Note, 11a
 Witness mark, Note, a
 Height of light above station mark, meters
 Height of telescope above station mark, 5 meters
 Detailed description:

STATE: ARIZONA COUNTY: Maricopa
 YEAR: 1947 LOCALITY: Perryville

DISTANCES AND DIRECTIONS TO REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND			
OBJECT	DISTANCE Feet	DIRECTION	AZIMUTH
ROCKY 1947		00 00 00.00	
R.M. No. 1 1947 SE	12.524	251 07 50.	
R.M. No. 2 1947 SW	12.495	334 01 29.	
Az. Mk. 1947 N. approx.			
0.3 mile airline.		73 46 33.8	

The station is located on the desert slope west from the foot of the White Tank mountains, about 20 miles west-northwest of Litchfield, about 16 miles east-northeast of Tonopah and about 3.5 miles east of the Hassayampa River, along the Phoenix-Parker transmission line, 108 feet southeast of pole 842, 33 feet southwest of center-line of road, 3 feet west of a 4x4 white witness post, flush and is stamped "POLE 842 1947".
 Reference mark No. 1 is approximately the same elevation as station, 33 feet southwest of the center-line of road, flush and is stamped "POL: 842 NO 1 1947".
 Reference mark No. 2 is approximately the same elevation as the station, flush and is stamped "POLE 842 NO 2 1947".
 The azimuth mark is near power line pole # 840, 30 feet northeast of center line of road; 10 feet northeast of pole, flush and is stamped "POL: 842 1947".

To reach from Perryville; go west on the road toward Tonopah for 7.5 miles to a crossroad 0.2 mile after passing under transmission line; continue straight ahead (W) for 2 miles to a road right; turn right, northerly, along power line, a two-poled H-frame; continue along this pole line road for 7.2 miles to its intersection with bladed road in the form of a "Y"; take the right road (leaving the power line) for 0.3 mile to the intersection of another road, another pole line and the azimuth mark as described above; turn right on this road and go 0.3 mile to station site as described above. A drive station.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: POLE 842 YEAR 1947
 STATE: ARIZ LOCALITY: Phoenix to Parker to Vicinity of Kingman
 Second-order Triangulation SOURCE: G-8348 FIELD CHECK: ARIZ 26, 28

GRID DATA	COORDINATES (Foot)	PLANE AZIMUTH (FOR ANGLE)	MARK
STATE: Ariz ZONE: C CODE: 0202	x 270,188.78 y 930,331.98	137°02'16" - 0 25 01	AZIMUTH MARK
STATE: ZONE: CODE:			

GEODETIC DATA	POSITION		SECONDS IN METERS	ELEVATION	
	LATITUDE	NORTH WEST			METERS FEET
	33°33'18".644			436.6	
	LONGITUDE: 112 40 15.646			1,432	

TO STATION	GEODETIC AZIMUTH (Foot reads)	DISTANCE	
		LOG ANGLE (Degrees)	METERS
AZIMUTH MARK	THIRD-ORDER 136°37'14".5		

- Continued from card 1 -

DEPARTMENT OF COMMERCE
 U. S. COAST AND GEODETIC SURVEY
 FORM 536
 (Rev. Feb. 1955)

RECOVERY NOTE, TRIANGULATION STATION Card 1 of 2 R

NAME OF STATION: POLE 842
 ESTABLISHED BY: D. H. Konichek YEAR: 1947 STATE: Arizona
 RECOVERED BY: R. L. Engdahl YEAR: 1956 COUNTY: Maricopa

Detailed statement as to the status of the original description; including marks found, stampings, changes made, and other pertinent facts:
 The station, reference marks and the azimuth mark were recovered as described and found in good condition. Following is a new and complete description.

Station is located about 20 miles west-northwest from Litchfield, about 16 miles east-northeast of Tonopah, about 3.5 miles east of the Hassayampa River, and is along the Phoenix-Parker transmission line. It is situated 108 feet southeast of a transmission pole, numbered 842, 32 feet southwest from the center of the road and 3 feet west of a 4 by 4-inch witness post. The mark projects 2 inches above the surface of the desert soil and the disk is stamped POLE 842 1947. Note 1a and 7a

Reference Mark number one is 30 feet southwest from the center of the road. It is set flush with the ground surface and the disk is stamped POLE 842 NO 1 1947. Note 11a
 Reference Mark number two is 72 feet southwest from the center of the road. It is set flush with the ground surface and the disk is stamped POLE 842 NO 2 1947. Note 11a
 The Azimuth Mark is located about 30 feet northeast from the center of the road and 10 feet northeast of a transmission pole. The mark is set flush with the ground surface and the disk is stamped POLE 842 1947. Note 16a

To reach the station from the City and County building in Buckeye, go westerly on U.S. Highway 80 for 0.4 mile to a cross street at the southwest edge of town. Turn right and continue northerly on Miller Road for 0.55 mile to a railway crossing. Continue straight ahead and follow the main road northerly for 4.4 miles to a cross road and a

DEPARTMENT OF COMMERCE
 U. S. COAST AND GEODETIC SURVEY
 FORM 536
 (Rev. Feb. 1955)

RECOVERY NOTE, TRIANGULATION STATION R

NAME OF STATION: POLE 842
 ESTABLISHED BY: D.H. Konichek YEAR: 1947 STATE: Arizona
 RECOVERED BY: R.L. Engdahl YEAR: 1956 COUNTY: Maricopa

Detailed statement as to the status of the original description; including marks found, stampings, changes made, and other pertinent facts:
 transformer station. Turn left and go west and north for 1.7 miles to a power line at forks, take right fork and continue along the power line for 7.8 miles to another fork. Take the right fork, leaving the power line, and continue for 1.75 miles to another power line at a fork, take the right fork and follow the power line for 0.25 mile to the azimuth mark on the left as described. Continue on the gravelled road and follow the power line for 0.3 mile to the station and reference marks on the right as described.

OBJECT		DISTANCE		DIRECTION
		Feet	Meters	
WHITE TANK 1910		41.09	12.525	00 00 00.0
R.M. No. 1	(SE)			51 11 09
ERL	(SW)	0.6 Mile		129 51 12.89
R.M. No. 2	(SW)	40.98	12.492	134 04 00
Azimuth Mark	(NW)	0.3 Mile		233 49 35.2

Carl A. Annis
 Carl A. Annis

*Name of chief of party should be inserted here. The officer who actually visited the station should sign his name at the end of the recovery note.
 Note.—One of these forms must be used for every station recovered.

JULY 1966
 PUBLISHED AND PRINTED BY:
 U.S. DEPARTMENT OF COMMERCE
 COAST AND GEODETIC SURVEY
 WASHINGTON D.C.

HORIZONTAL CONTROL DATA

by the
 Coast and Geodetic Survey
 NORTH AMERICAN 1927 DATUM

QUAD 331124 STATION 1013
 ARIZ
 LATITUDE 33°30' TO 34°00'
 LONGITUDE 112°30' TO 113°00'
 DIAGRAM NI 12-7 PHOENIX

DEPARTMENT OF COMMERCE
 U. S. COAST AND GEODETIC SURVEY
 FORM 510
 Rev. Oct., 1953

DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: HASSA
 CHIEF OF PARTY: D.H. Konlchek
 Surface-station mark, Note,° 2
 Underground-station mark, Note,°
 Reference mark, No.1 Note,° 12c
 Reference mark, No.2 Note,° 12c
 Azimuth mark, Note,°
 Witness mark, Note,°
 Height of light above station mark meters.
 Height of telescope above station mark, 6 meters.

STATE: Arizona COUNTY: Maricopa
 YEAR: 1947 LOCALITY: Tonopah

DISTANCES AND DIRECTIONS TO REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND				
OBJECT	Hor.	DISTANCE	DIRECTION	AZIMUTH
TRANS 1947			0 00 00	
POLE 842 1947 (Azimuth)	5.0 Mi		135 31 44.59	
R.M.No.1 1947 SE	5.687m		148 21 20	
R.M.No.2 1947 NW	6.099m		340 58 04	

Detailed description: The station is located about 13 miles airline east-northeast of Tonopah and 1 mile west of the Hassayampa River on a lone short rocky ridge. The station mark is a bronze disk set on highest point of ridge 5 paces west of a rock cairn. It projects 6 inches and is stamped, "HASSA 1947".

Reference mark No.1 is a bronze disk set 1 foot lower than the station mark, projects 2 inches and is stamped, "HASSA NO 1 1947".

Reference mark No.2 is a bronze disk set flush, 3 feet lower than the station mark and is stamped, "HASSA NO 2 1947".

Station POLE 842 1947 was used as an azimuth mark.

To reach the station from Perryville; go west 13 miles to a crossroad; turn right, go 5.0 miles to a crossroad at a powerline; turn left along powerline, go 4.75 miles to a gate; pass through gate, continue 4.1 miles to a dirt road left at powerline pole # 773;

turn left, go 2.3 miles to a fence line; continue 1.1 mile to a point west of station; turn left, go cross country east as far as possible. A four wheel drive vehicle can be driven to base of ridge.

R.M. Warner

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: HASSA

YEAR 1947

STATE: Ariz

LOCALITY: Phoenix to Parker to Vicinity of Kingman

Second-order Triangulation

SOURCE: C-8348

FIELD SKETCH: ARIZ 26, 28

GRID DATA	COORDINATES (Feet)	PLANE AZIMUTH θ FOR AGE ANGLE	MARK
STATE: Ariz ZONE: C CODE: 0202	E 247,752.03 N 938,001.57	- 0 27 29	
STATE: ZONE: CODE:	E N		

GEODETIC DATA	POSITION		SECONDS IN METERS	ELEVATION
	LATITUDE: 33°34'32".827 LONGITUDE: 112°44'41".479	NORTH WEST		434.7 METERS 1,426 FEET

TO STATION	GEODETIC AZIMUTH (From south)	DISTANCE	
		LOGARITHM (Stokers)	METERS
TRANS	152°53'07".54	3.955 2893	9,021.72

JULY 1966
 U.S. DEPARTMENT OF COMMERCE
 NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
 NATIONAL OCEAN SURVEY

HORIZONTAL CONTROL DATA

by the
 Coast and Geodetic Survey
 NORTH AMERICAN 1927 DATUM

QUAD 331123 STATION 1007
 ARIZ
 LATITUDE 33°00' TO 33°30'
 LONGITUDE 112°30' TO 113°00'
 DIAGRAM NI 12-7 PHOENIX

FORM 525
 10-10-54

U.S. DEPARTMENT OF COMMERCE
 COAST AND GEODETIC SURVEY
 DESCRIPTION OF **BUCKEYE CROSS** STATION.
 TRAVERSE

849.

NAME OF STATION: **DEAD** STATE: **Arizona** COUNTY: **Maricopa**
 CHIEF OF PARTY: **C.A. Annis** YEAR: **1962** DESCRIBED BY: **R.P.K.**

NOTE	HEIGHT OF TELESCOPE ABOVE STATION MARK	HEIGHT OF LIGHT ABOVE STATION MARK	DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION		
	1	1	FEET	METERS	DIRECTION
2					
17a	BN 33 1947		approx. 0.3 mile	83 49	00 00 00.0
	Azimuth Mark		approx. 1.1 miles	221 56	09.2
	VOR, Buckeye BXX				
12a	R.M. No. 1		19.39	5.911	282 57 59
12a	R.M. No. 2		18.11	5.520	309 47 54
	Los Angeles, Phoenix Airway Beacon No. 33 1947		NE approx. 2 miles	359 56	20.5

Station is located about 32 miles west of Phoenix, about 5 miles north-northwest of Buckeye and about 2 miles southwest of the Los Angeles, Phoenix Airway Beacon.

To reach from the Valley National Bank in Buckeye, go west on U.S. Highway 80 for 2.0 miles to where U.S. Highway 80 turns left, continue straight ahead for 0.2 miles to crossroad, turn right and go north on surfaced road for 0.5 mile to crossroad, make slight jog thence continue north on main bladed road for 1.0 mile to crossroad, continue north on main bladed road for 1.25 miles to where road crosses canal, continue north on bladed road keeping straight ahead at all side roads for 1.4 miles to a road fork and the azimuth mark on left as described, keep right and go easterly for 0.15 mile to another fork, keep left and go northwest then westerly following track road for 0.25 miles to end of truck travel. From here pack west up trail to highest part of hill and station. (This is about a 15 minute pack.)

Station mark, a standard traverse station disk stamped DEAD 1962, is cemented in a drill hole in outcropping bedrock which is about 1 foot above the ground. The mark is on the south side of the highest part of hill.

Reference mark 1, a standard reference disk stamped DEAD NO 1 1962, is cemented in a drill hole in outcropping bedrock and is about the same elevation as the station.

Reference mark 2, a standard reference disk stamped DEAD NO 2 1962, is cemented in a drill hole in outcropping bedrock and is about 1 1/2 feet lower in elevation than the station.

Azimuth mark, a standard azimuth disk stamped DEAD 1962, is cemented in a drill hole in outcropping bedrock which projects about 5 feet above the surrounding area. The mark is 100 feet west of the center of road and 4 feet west of the witness post.

* Refer to notes in manuals of triangulation and other publications of triangulation. † Direction-angle measured clockwise, referred to initial station.
 ‡ To nearest meter only, when no trigonometric leveling is being done.

USCGM-DC 37171-P-55

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: **DEAD** YEAR: **1962**
 STATE: **Arizona** LOCALITY: **Arizona Hwy. Survey
 Ehrenberg to Phoenix to Casa Grande**
 Second-Order Triangulation and Traverse SOURCE: **G-12917** FIELD SKETCH: **Ariz. 49-II**

GRID DATA	COORDINATES (Feet)	PLANE AZIMUTH (FOR Δ) ANGLE	MARK
STATE: Ariz. ZONE: C CODE: 0202	X 282,991.91 Y 885,842.21	319° 21' 24" - 0 23 31	AZIMUTH MARK
STATE: ZONE: CODE:			

GEODETIC DATA	POSITION		SECONDS IN METERS	ELEVATION
	LATITUDE:	LONGITUDE:		METERS FEET
	33° 25' 59".3731 NORTH	112 37 40.7620 WEST		432.5 1419
TO STATION		GEODETIC AZIMUTH (From south)	DISTANCE (Meters)	
		SECOND-ORDER		
LAND	100° 48' 25".85	7,868.811*		
BN 33	235 08 43.24	3,198.152*		
ROAD	280 00 14.90	8,470.625*		
		THIRD-ORDER		
VOR BUCKEYE BXX	97 05 11.1	18,751.48		
AIRWAY BEACON NO 33 LOS ANGELES-PHOENIX	235 05 08.0	3,200.64		
AZIMUTH MARK	318 57 52.9			
BUCKEYE WATER TANK	324 27 34.4	7,243.14		
* Tellurometer length				

FORM 521 (7-23-54)

USCGM-DC 11521-P-1

JULY 1968

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SURVEY
REV: MAR 1973

HORIZONTAL CONTROL DATA

by the
Coast and Geodetic Survey
NORTH AMERICAN 1927 DATUM

sheet 1 of 2

QUAD 331123 STATION 1005
ARIZ
LATITUDE 33°00' TO 33°30'
LONGITUDE 112°30' TO 113°00'
DIAGRAM NI 12-7 PHOENIX

"C" (G. L. O.) (Maricopa County, E. B. Latham, 1034).—About 8 miles, air line, north of Hassayampa, on the corner of sects. 4, 5, 8, and 9, in T. 1 N., R. 5 W. Marked by a General Land Office section corner marker. Reference mark No. 1, a standard bronze reference disk, note 12c, is 27.848 meters (91.86 feet) from station in azimuth 74°07'. Reference mark No. 2, a standard bronze reference disk, note 12c, is 15.290 meters (50.13 feet) from station in azimuth 842°36'. The azimuth mark (reference mark No. 3), a standard bronze disk, note 11a, is 0.8 mile from station in azimuth 359°23'55".

RECOVERY NOTE, TRIANGULATION STATION

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
FORM 502

NAME OF STATION: "C"(G.L.O.) 1934 STATE: Arizona COUNTY: Maricopa
Established by: E.B.L. YEAR: 1934 LOCALITY: Hassayampa
Recovered by: D.H.Kordtchek YEAR: 1947

Detailed statement as to the status of the original description:

Station recovered, all marks found as described and in good condition. The station is located about 8 miles airline north of Hassayampa on the corner of sections 4, 5, 8 and 9 in township 1 N, range 5 W. The station mark is a General Land Office mark set atop an iron pipe which is encased in concrete. It is 5 paces south of the centerline of road, projects 1 1/2 inches and is stamped, "T1N, R5W, S5, S4, S6, S9 1915". Reference mark No. 1 is a bronze disk as described in note 12c, set 8 paces south of centerline of road, 10 inches lower than the station mark and is stamped, "GLO C 1934 NO 1". Reference mark No. 2 is a bronze disk as described in note 12c, set 22 paces south of centerline of road, 18 inches lower than the station mark and is stamped, "GLO C 1934 NO 2". The azimuth mark is a bronze reference mark as described in note 12c, set 10 paces west of centerline of road, projects 4 inches and is stamped, "GLO C AZIMUTH 1934 NO 3". To reach the station from Hassayampa; go northwest on gravel road 1.7 mile to a fork just a floor crossing railroad tracks, turn right, go 6.0 miles to azimuth mark on left; continue 0.8 mile to crossroad; turn right, go 0.1 mile to station on right. A drive station.

OBJECT	BOR. DISTANCE	DIRECTION
ROCKY 1947		0 00 00
R.M. No. 2 1934 S3E	15.271m	190 10 08
Azi. Mk. 1934 S	0.8 mile	166 58 41.4
R.M. No. 1 1934 SW	27.848m	241 41 09

Observations made from a 0.9 m tripod.

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
FORM 502
(Rev. Feb. 1968)

NAME OF STATION: C (GLO) RECOVERY NOTE, TRIANGULATION STATION
Established by: E. B. Latham YEAR: 1934 STATE: Arizona
Recovered by: R. L. Engdahl YEAR: 1956 COUNTY: Maricopa

Detailed statement as to the status of the original description; including marks found, stampings, changes made, and other pertinent facts:

The Station Mark, Reference Mark No. 1, Reference Mark No. 2 and the Azimuth Mark were recovered and found in good condition. A new and complete description follows. The station is about 15 miles northwest of Buckeye, about 11 miles north-northwest of Palo Verde about 8 miles north of Hassayampa and 1.0 mile east of the Wickensburg Road. The Station Mark is 10 feet southwest of the center of a gate, 9 feet south of a track road and 4 feet west of a fence corner. It is a U.S. General Land Office Survey Mark secured to the top of a 2-inch pipe which is set in the top of a concrete post that is 10 inches square at the top. The pipe projects 1 1/2 inches and the mark is stamped: T1N R5W S5 S4 S8 S9 1915. Reference Mark No. 1 is 21 feet south of the center of a track road. It projects 2 inches and is stamped G.L.O.C. No 1 1924. (Note 12c) Reference Mark No. 2 is 50 feet south of an east-west fence and 15 feet east of a north-south fence. It projects 2 inches and is stamped G.L.O.C. NO 2 1934. (Note 12c) The distance between R.M. No. 1 and R.M. No. 2 is 105.35 feet. The Azimuth Mark is 30 feet west of the center of Wickensburg Road. It is a reference mark disk stamped G.L.O.C. AZIMUTH 1934 NO 3.

To reach the station from the Post Office in Palo Verde go west on paved road for 2.5 miles to Hassayampa. Go north on gravel road from Hassayampa for 1.6 miles to a fork just after crossing the railroad tracks, take right fork and go northerly on the gravelled road for 5.6 miles to the azimuth mark on the left. Continue north for 0.75 mile to a crossroad and a street sign on the right reading W VAN BUREN ST WICKENBURG RD. Turn right and go east for 0.1 mile to the station and reference marks on the right.

OBJECT:	BEARING:	DISTANCES:		DIRECTION:
		Feet	Meters	
R.M. No. 2	S3E	50.10'	15.270'	120 00 00.0
Azimuth Mark	S	(0.75 mile)		137 39 10.4
Reference Mark No. 1	S4	91.37'	27.849'	212 21 42

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: C GLO YEAR: 1934, 1948, 1956, 1962
STATE: Arizona LOCALITY: Yuma to Stewart Dam
First Order Triangulation SOURCE: 0-3022; 0-8348 FIELD SKETCH: ARIZ. 8-II-26, 28, 0-11970; 0-12917 35; 49-II

GRID DATA	COORDINATES (Foot)	PLANE AZIMUTH (MOR 481 ANGLE)	MARK
STATE: ARIZ. ZONE: C CODE: 0202	X 236,428.13 Y 892,355.40	0° 22' 41" 359 52 30" - 0 28 35"	AZIMUTH MARK 1962 AZIMUTH MARK RM 3
STATE: ZONE: CODE:			

GEODETTIC DATA	POSITION		SECONDS IN METERS	ELEVATION
	LATITUDE:	LONGITUDE:		
	33° 27' 00".3210" NORTH	112° 46' 50".8180" WEST		324.7' METERS 1065' FEET
	TO STATION		GEODETTIC AZIMUTH (From 0000)	DISTANCE (Meters)
	AZIMUTH MARK RM 3		THIRD-ORDER 359° 23' 55" 11"	
	AZIMUTH MARK 1962		359 54 05.5"	

FORM 502 (11-22-68)

USE DOUBLE TRIANGLE

ORIG. 1973
 U.S. DEPARTMENT OF COMMERCE
 ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION
 COAST AND GEODETIC SURVEY

HORIZONTAL CONTROL DATA

by the
 Coast and Geodetic Survey
 NORTH AMERICAN 1927 DATUM sheet 2 of 2

QUAD 331123 STATION 1005
 ARIZ
 LATITUDE 33°00' TO 33°30'
 LONGITUDE 112°30' TO 113°00'
 DIAGRAM NI 12-7 PHOENIX

Reported reset by road const. use with caution.

C.G.S. FORM 525
 10-591

U. S. DEPARTMENT OF COMMERCE
 ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION
 COAST AND GEODETIC SURVEY

DESCRIPTION OF TRIANGULATION STATION QUAD 331123

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: **C GLO 2** STATE: Arizona COUNTY: Maricopa
 CHIEF OF PARTY: L.F. Smith YEAR: 1971 DESCRIBED BY: L. Wakefield

NAME OF STATION: C GLO 2 STATE: Arizona YEAR: 1971 FIRST

NOTE	HEIGHT OF TELESCOPE ABOVE STATION MARK (1.5 METERS)	HEIGHT OF LIGHT ABOVE STATION MARK (1.5 METERS)	DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION			
1a	SURFACE-STATION MARK	UNDERSOUND-STATION MARK	DISTANCE		DIRECTION	
7a			BEARING	FEET	METERS	
	Traversed distance					
	ROCKY 1947					0 00 00.0
	RM 4		NE (26.945)	8.213		52 50 13.1
	Los Angeles-Phoenix Airway Beacon No.	33 1947				77 37 54.9
	BN 33 1947					77 38 47.4
*	C GLO 1934 Temp. Point		(75.38)	22.976		137 03 02.9
	Azimuth Mark (1971) 0.35 mile		S			164 42 42.4
	RM 1		SW 102.78	(31.327)	196	19 12

LOCALITY: Yuma to Stewart Dam
 SOURCE: C-10749 FIELD SKETCH

GEODETIC LATITUDE	33 27 00.96420	ELEVATION	
GEODETIC LONGITUDE	112 46 51.26827		

STATE COORDINATES (FEET)				
STATE ZONE	CODE	X	Y	FROM ANGLE
Ariz. C	0202	236,390.52	892,420.72	- 0 28 35

* PLANE AZIMUTH HAS BEEN COMPUTED BY THE β FORMULA NEGLECTING THE SECOND TERM

TO STATION OR OBJECT	GEODETIC AZIMUTH (FROM TRUE)	PLANE AZIMUTH (FROM TRUE)	CODE
AZIMUTH MARK	357 15 13.6	357 43 49	0202
Position determined by traverse from station C GLO and checked by additional observations.			

Detailed description:

The station is located about 11 miles airline north-northwest of Palo Verde, 10 miles east-southeast of Tonopah and 0 miles north of Hassayampa. It is at the intersection of 339 Avenue and West Van Buren Street. It is on property which belongs to the County of Maricopa.

The station mark is a standard disk stamped, GLO C 2 1971. It is set in the top of a 12 inch concrete monument which projects 5 inches. It is 61 feet north of the approx. center of West Van Buren Street, 36 feet west of the center of 339 Avenue, 27 feet southwest of the southwest corner of the concrete head wall of a cattle guard, 3 feet east of a fence line and 1 foot west of a witness post.

Reference mark 1 is a standard disk stamped, GLO C No 1 1934. It is set in a drill hole in the top of a small black boulder which projects about 3 inches. It is in the southwest corner of the intersection, 26 feet west of a street sign and 21 feet south of the center of West Van Buren Street.

Reference mark 4 is a standard disk stamped, GLO C 2 NO 4 1971. It is set in a drill hole in top of the south end of the west head wall of the cattle guard.

The azimuth mark is a standard disk stamped, GLO C 2 1971. It is set in the top of a 12 inch concrete monument which projects 3 inches. It is at the north side of a small Palo Verde tree which is just north of a small wash. The mark is 1 foot east of the witness post.

ANGLES OBSERVED AT AZIMUTH MARK

C GLO 2	0 00 00.0
C GLO 1934 (temp. point)	1 01 04.4

* Refers to notes in manuals of triangulation and state publications of triangulation. 1 Direction-angle measured clockwise, referred to initial station. 1 To nearest meter only, when no trigonometric leveling is being done.

TP@ S.E. COR. OF SECTION 7 Fd. TRANSIT RES. 100-1504
 200' SET C.P.S. B.S. PANEL # W006 MCHD B.C. FLUSH
 W/PVMT F.S. W007 1/2" REBAR

- 1) 183.42.54
- 2) 7.25.44
- 4) 14.51.26
- (M) 183.42.52 ✓

S.E. SEC. OF - W006

ZD 89.51.25

ZR 270.07.54

ZM 89.51.45

S.D 5303.54

H.D 5303.53

SE. SEC. OF 7 - W007

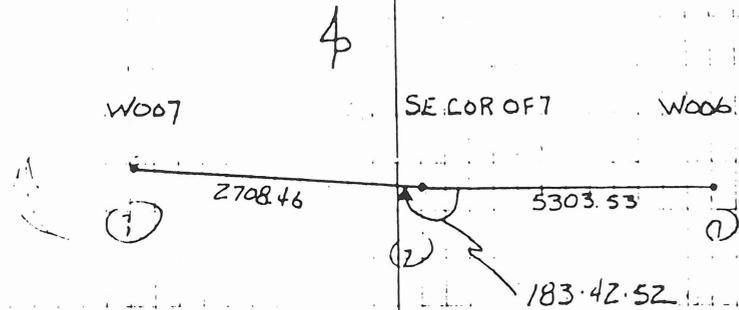
ZD 89.56.15

ZR 270.03.06

ZM 89.56.34

S.D 2708.46

H.D 2708.46



TC W007 S.S. SE COR OF SEC 7 F.S. RANDOM PT.

- 1) 177.10.55
- 2) 354.21.50
- 4) 348.43.44
- M) 177.10.56 ✓

TC RANDOM PT. B.S. W007 F.S. W008 S.E. COR OF SECTION 8

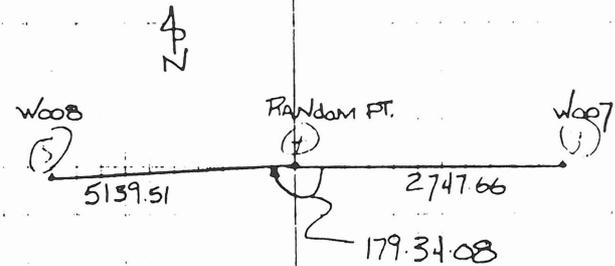
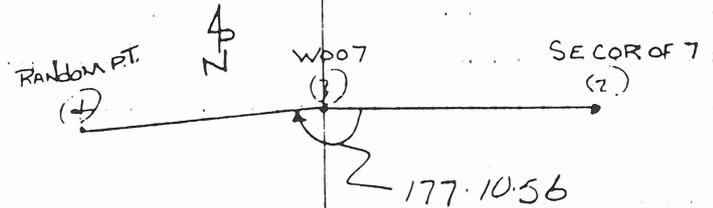
- 1) 179.34.20
- 2) 359.08.15
- 4) 358.16.35
- 6) 357.24.50
- M) 179.34.08 ✓

RANDOM - 7

- ZD 89.57.49
- ZR 270.01.11
- ZM 89.58.19
- S.D 2747.66
- H.O. 2747.66

RANDOM - 8

- ZD 9003.34
- ZR 269.55.38
- ZM 9003.58
- S.D. 5139.51
- H.O. 5139.51



Tie between Sun Valley Parkway Stationing
and Aerial Control -

Using W015 to W021

	Y (N)	X (E)
W015	902637.716	268173.314
W021	918518.630	268238.985
Δ	15880.914	65.671

INVERSE = 15881.05 State Plane

$$\text{SCALE FACTOR} = \left(0.9999615366 + 0.9999615012 \right) / 2$$

$$= 0.9999615189$$

TRUE DIST = 15881.66

BUT Aerial DIST IS SP INVERSE WITH-
OUT SF ADJUSTMENT.

So - Sta from Sun Valley

W015	145403.94
W021	303489.80
	<hr/>
	15885.86

$$\text{Relative SF} = \frac{15885.86}{15881.05} = 1.000303$$

check other points

	N	E	Sta
W033	897414.828	268142.772	92+25.09+55
W043	923814.713	268220.627	356+88.99+32.12
DIST	26400.00		26408.92

$$SF = \frac{26408.92}{26400.00} = 1.000338$$

W033	897414.828	268142.772	92+25.09+55
W021	918518.630	268238.985	303+89.80
DIST	21104.02		21109.71

$$SF = \frac{21109.71}{21104.02} = 1.000270$$

Use average of scales factors

from W021 to W033 (without curve)

$$(1.000270 + 1.000303) / 2 = 1.000286$$

SUBJECT
CLIENTWTW
FEDMCBY
CK

DATE 9/20/22 SHEET

2 OF 3

MATCH AT W015

$$\text{DIST} = 159 + 79.19 \quad \text{STA} = 14503.94$$

$$\Delta = 1475.25$$

AT DIST = 0

$$\begin{aligned} \text{STA} &= -15979.19 (1.000286) + 14503.94 \\ &= -15983.76 + 14503.94 = -1479.82 \end{aligned}$$

$$\therefore \text{STA} = -1479.82 + 1.000286 \text{ DIST}$$

checks -

$$\begin{aligned} \text{W015} \quad \text{STA} &= -1479.82 + 1.000286 (15979.19) \\ &= 14503.94 \quad \text{vs} \quad 14503.94 \\ &\quad \text{AMI} \quad \quad \quad \text{STA} \end{aligned}$$

$$\begin{aligned} \text{W021} \quad \text{STA} &= -1479.82 + 1.000286 (31860.25) \\ &= 30389.54 \quad \text{vs} \quad 30389.80 \quad +.26 \\ &\quad \text{AMI} \quad \quad \quad \text{STA} \end{aligned}$$

$$\begin{aligned} \text{W033} \quad \text{STA} &= 1.000286 (10756.25) - 1479.82 \\ &= 9279.51 \quad \text{vs} \quad 9280.09 \quad +.48 \end{aligned}$$

The tie is certainly good enough for our purposes. Use SV stations to provide easy reference.

SUBJECT WTW
CLIENT FCDMC

BY *[Signature]*
CK

DATE 9/30/22 SHEET 3 OF 3
DATE

83
25
58
67
625

PT#	DESCRIPTION	LATITUDE	LONGITUDE	X	Y	ZONE	CONVERGENCE	SCALE FACTOR
1	WHITE TANK WASH ADMS GPS CONTROL NAD27							
2								
3								
4								
5	W001	STA. "HASSA" (USC&GS)	33 34 32.82700	112 44 41.47900	247752.037	938001.561	AZ C	0-27 28.96 0.9999728539
6	W002	STA. "POLE 842" (USC&GS)	33 33 18.64400	112 40 15.64600	270188.783	930331.976	AZ C	0-25 1.11 0.9999604703
7	W003	STA. "ERDL" (USC&GS)	33 32 51.42200	112 40 36.47500	268405.916	927593.491	AZ C	0-25 12.32 0.9999614123
8	W004	STA. "GLO C 2" (USC&GS)	33 27 0.96420	112 46 51.26827	236390.518	892420.721	AZ C	0-28 35.06 0.9999795667
9	W005	STA. "DEAD" (USC&GS)	33 25 59.37310	112 37 40.76200	282991.905	885842.219	AZ C	0-23 30.94 0.9999539216
10	W006	NE COR. S17,T 1N,R 4W	33 26 6.41091	112 40 35.98988	268147.336	886658.586	AZ C	0-25 7.57 0.9999615510
11	W007	ECC N 1/4 S18,T 1N,R 4W	33 26 7.77914	112 42 10.46248	260142.410	886856.402	AZ C	0-25 59.65 0.9999658746
12	W008	NE COR. S14,T 1N,R 5W	33 26 8.23607	112 43 43.51921	252256.800	886963.197	AZ C	0-26 50.93 0.9999702772
13	W009	NE COR. S10,T 1N,R 5W	33 27 0.35371	112 44 45.92210	247010.572	892272.483	AZ C	0-27 25.95 0.9999732848
14	W010	NE COR. S11,T 1N,R 5W	33 27 0.51277	112 43 43.63725	252288.072	892246.883	AZ C	0-26 51.62 0.9999702592
15	W011	PANEL POINT	33 28 27.28901	112 45 5.18059	245449.397	901072.149	AZ C	0-27 37.63 0.9999741917
16	W012	ECC NE S35,T 1N,R 5W	33 28 44.52883	112 43 43.29577	252399.170	902759.601	AZ C	0-26 52.66 0.9999701958
17	W013	NE COR. S36,T 2N,R 5W	33 28 44.79984	112 42 41.74648	257612.689	902746.659	AZ C	0-26 18.70 0.9999672708
18	W014	NE COR. S31,T 2N,R 4W	33 28 44.76849	112 41 39.71068	262867.169	902703.707	AZ C	0-25 44.48 0.9999643858
19	W015	NE COR. S32,T 2N,R 4W	33 28 44.50432	112 40 37.06279	268173.314	902637.716	AZ C	0-25 9.91 0.9999615366
20	W016	ECC E 1/4 S23,T 2N,R 5W	33 30 2.98608	112 43 44.93235	252322.601	910690.423	AZ C	0-26 54.49 0.9999702388
21	W017	E 1/4 S22,T 2N,R 5W	33 30 11.88676	112 44 47.06605	247068.293	911631.649	AZ C	0-27 28.90 0.9999732506
22	W018	NE COR. S14,T 2N,R 5W	33 31 21.56022	112 43 44.84586	252392.103	918631.945	AZ C	0-26 55.37 0.9999701991
23	W019	NE COR. S13,T 2N,R 5W	33 31 21.64121	112 42 42.21888	257694.097	918599.050	AZ C	0-26 20.78 0.9999672250
24	W020	NE COR. S18,T 2N,R 4W	33 31 21.56118	112 41 40.83329	262890.862	918551.558	AZ C	0-25 46.87 0.9999643723
25	W021	NE COR. S17,T 2N,R 4W	33 31 21.62776	112 40 37.66105	268238.985	918518.630	AZ C	0-25 11.98 0.9999615012
26	W022	PANEL POINT	33 33 21.24570	112 40 36.06455	268462.754	930607.557	AZ C	0-25 12.42 0.9999613820
27	W023	PANEL POINT	33 33 18.27231	112 42 8.05008	260676.088	930365.074	AZ C	0-26 3.24 0.9999655800
28	W024	NE COR. S 2,T 2N,R 5W	33 33 6.14496	112 43 44.78791	252479.825	929202.451	AZ C	0-26 56.57 0.9999701489

 31 COMBINED SCALE FACTOR (GRID TO GROUND) = 1.000085711479 THIS IS PRECISE FOR POINT #W016, AND SHOULD BE CONSIDERED
 32 APPROXIMATE FOR OTHER POINTS. MGPS DOES NOT RECOMMEND USE OF THIS FACTOR FOR COORDINATE CONVERSION.
 33 *****

34
 35 AN ASTERISK (*) INDICATES A POINT FIXED IN THE ADJUSTMENT.
 36

37
 38 CERTIFICATION

39
 40 I, Glen C. McEwen, Arizona Registered Land Surveyor #17353
 41 certify that these coordinates correctly represent a survey
 42 performed under my supervision during October of 1991.
 43
 44
 45
 46
 47
 48
 49
 50
 51
 52
 53
 54
 55

14112 G.B.

PROGRAM PC83

WHITE TANK WASH ADMS GPS CONTROL

14112 G.P.
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57

PT#	DESCRIPTION	LATITUDE	LONGITUDE	NORTH(Y)	EAST(X)	ZONE	CONVERGENCE	SCALE
W001	STA. "HASSA" (USC&GS)	33 34 32.96080	112 44 44.10455	285917.247	136408.702	AZ C	-0 27 30.41	0.99997298
W002	STA. "POLE 842" (USC&GS)	33 33 18.78321	112 40 18.26458	283579.606	143247.446	AZ C	-0 25 2.56	0.99996058
W003	STA. "ERDL" (USC&GS)	33 32 51.56027	112 40 39.09486	282744.864	142703.999	AZ C	-0 25 13.77	0.99996153
W004	STA. "GLO C 2" (USC&GS)	33 27 1.10712	112 46 53.89150	272024.065	132945.740	AZ C	-0 28 36.51	0.99997970
W005	STA. "DEAD" (USC&GS)	33 25 59.51681	112 37 43.36463	270018.805	147150.070	AZ C	-0 23 32.37	0.99995403
W006	NE COR. S17,T 1N,R 4W	33 26 6.55452	112 40 38.59970	270267.668	142625.354	AZ C	-0 25 9.01	0.99996167
W007	ECC N 1/4 S18,T 1N,R 4W	33 26 7.92264	112 42 13.07561	270327.977	140185.417	AZ C	-0 26 1.09	0.99996599
W008	NE COR. S14,T 1N,R 5W	33 26 8.37934	112 43 46.13571	270360.538	137781.846	AZ C	-0 26 52.38	0.99997040
W009	NE COR. S10,T 1N,R 5W	33 27 0.49603	112 44 48.54136	271978.841	136182.769	AZ C	-0 27 27.40	0.99997341
W010	NE COR. S11,T 1N,R 5W	33 27 0.65515	112 43 46.25423	271971.030	137791.377	AZ C	-0 26 53.06	0.99997038
W011	PANEL POINT	33 28 27.42968	112 45 7.80298	274661.018	135706.871	AZ C	-0 27 39.07	0.99997432
W012	ECC NE S35,T 1N,R 5W	33 28 44.66959	112 43 45.91563	275175.359	137825.188	AZ C	-0 26 54.11	0.99997032
W013	NE COR. S36,T 2N,R 5W	33 28 44.94079	112 42 44.36407	275171.410	139414.294	AZ C	-0 26 20.15	0.99996739
W014	NE COR. S31,T 2N,R 4W	33 28 44.90968	112 41 42.32595	275158.315	141015.887	AZ C	-0 25 45.92	0.99996450
W015	NE COR. S32,T 2N,R 4W	33 28 44.64559	112 40 39.67504	275138.192	142633.245	AZ C	-0 25 11.36	0.99996165
W016	ECC E 1/4 S23,T 2N,R 5W	33 30 3.12553	112 43 47.55328	277592.711	137801.840	AZ C	-0 26 55.94	0.99997036
W017	E 1/4 S22,T 2N,R 5W	33 30 12.02577	112 44 49.68894	277879.603	136200.311	AZ C	-0 27 30.35	0.99997338
W018	NE COR. S14,T 2N,R 5W	33 31 21.69840	112 43 47.46833	280013.326	137823.002	AZ C	-0 26 56.82	0.99997032
W019	NE COR. S13,T 2N,R 5W	33 31 21.77974	112 42 44.83899	280003.299	139439.077	AZ C	-0 26 22.23	0.99996735
W020	NE COR. S18,T 2N,R 4W	33 31 21.70009	112 41 43.45144	279988.825	141023.069	AZ C	-0 25 48.32	0.99996449
W021	NE COR. S17,T 2N,R 4W	33 31 21.76697	112 40 40.27650	279978.786	142653.214	AZ C	-0 25 13.43	0.99996162
W022	PANEL POINT	33 33 21.38392	112 40 38.68381	283663.579	142721.346	AZ C	-0 25 13.87	0.99996150
W023	PANEL POINT	33 33 18.40954	112 42 10.67157	283589.652	140347.960	AZ C	-0 26 4.69	0.99996570
W024	NE COR. S 2,T 2N,R 5W	33 33 6.28126	112 43 47.41160	283235.261	137849.731	AZ C	-0 26 58.03	0.99997027

 COMBINED SCALE FACTOR (GRID TO GROUND) = 1.000085711479 THIS IS PRECISE FOR POINT #W016, AND SHOULD BE CONSIDERED
 APPROXIMATE FOR OTHER POINTS. MGPS DOES NOT RECOMMEND USE OF THIS FACTOR FOR COORDINATE CONVERSION.

AN ASTERISK (*) INDICATES A POINT FIXED IN THE ADJUSTMENT.

CERTIFICATION

I, Glen C. McEwen, Arizona Registered Land Surveyor #17353
 certify that these coordinates correctly represent a survey
 performed under my supervision during October of 1991.

LIETZ

230

LIETZ

TRANSIT FIELD BOOK

BROOKS, HERSEY & ASSOCIATES, INC.
5246 SOUTH 40th STREET
Property of PHOENIX, ARIZONA 85040

Address

Telephone

This Book is manufactured of a High Grade
50% Rag Paper having a Water Resisting Surface,
and is sewed with Nylon Waterproof Thread.

INDEX

PANEL PT	PAGE	PANEL PT	PAGE
Z 263	4	Y 263	74
W 033	5	Z 263	76
C 264	8		
W 006	11		
W 008	17		
W 010	20		
W 035	23		
W 263	27		
W 038	28		
W 016	31		
W 012	34		
Y 362	34		
W 011	38		
W 017	43		
W 263	49		
W 010	50		
W 009	52		
W 036	56		
W 035	58		
W 032	61		
W 031	64		

1 2

10/24/91
M. HOLLY
R. SAVAGE

BENCH THUR. AERIAL
PANELS

	+	HI		-	ELEV.	REMARKS
					1137.990	U.S. COAST AND GEODETIC SURVEY BRASS CAP STAMPED 2263
5.11						
3.73	3.733	1141.723				
2.36						
			5.33			
			4.00	4.00	1137.723	T.P.#1 ROCK E. RD. PAINTED BLUE
			2.67			
7.98						
6.47	6.473	1144.196				
4.97						
			6.45			T.P.#2 " " " "
			4.97	4.97	1139.226	
			3.49			
8.37						
6.57	6.57	1145.796				
4.77						
			6.48			
			4.53	4.533	1141.263	T.P.#3 ROCK ONE RD. PYMT. PAINTED BLUE
			2.59			
7.61						
6.09	6.087	1147.35				
4.56						

	+	HI		-	ELEV.	REMARKS
		1147.35				
			-5.07			
			3.57	3567	1143.783	T.P.#4 ROCK @ E/P PAINTED WHITE
			2.06			
8.16						
6.73	6.73	1150.513				
5.30						
			4.76	adj	1147.637	
			2.89	2887	1147.626	VERTICAL PANEL #033 BRASS CAP FLUSH W/PVMT. @
			1.01			INTER. OF PALO VERDE & McDOWELL
3.59						
1.91	1.913	1149.539				
0.24						
			9.06			
			7.46	7.463	1142.076	T.P.#6 T/C IN MED. WEST OF & PAINTED WHITE
			5.87			ON PALO VERDE
3.52						
2.17	2.17	1144.246				
0.82						
			8.55			
			7.16	716	1137.086	T.P.#7 " " " " " "
			5.77			
3.18						
1.62	1.617	1138.703				
0.05						

	+	HI		-	ELEV.	REMARKS
		1138.703	8.53			
			7.07	7.07	1131.633	T.P.# 8 T/C IN MED. WEST OF E. ON PALO VERDE
			5.61			
353						
1.97	1.97	1133.603				
0.41						
			8.33			
			6.85	6.85	1126.753	T.P.# 9 T/C " " " "
			5.37			
4.24						
2.77	2.767	1129.520				
1.29						
			9.31			
			7.75	7.75	1121.77	T.P.# 10 T/C " " " "
			6.19			
4.02						
2.63	2.63	1124.40				
1.24						
			9.25			
			7.84	7.837	1116.563	T.P.# 11 T/C IN MED. WEST OF E.
			6.42			
4.22						
2.64	2.637	1119.20				
1.05						

	+	HI		-	ELEV	REMARKS
		1097.477				
			9.15			
			7.83	7.83	1089.647	T.P.#16 T/C IN MED WEST OF E ON P.V. WHITE PANT SPOT
			6.51			
3.28						
1.91	1.913	1091.56				
0.55						
			9.01		Adj 1083.932	
			7.67	7.667	1083.893	T.P.#17 U.S. COAST & GEODETIC SURVEY BRASS CAP
			6.32			STAMPED C 264 ELEV = 1083.932 WEST SIDE OF P.V. RD.
4.78						55± WEST OF E; 300± S. OF WASHINGTON ST.
3.22	3.223	1087.116				
1.67						
			8.13			
			6.72	6.72	1080.396	T.P.#18 T/C IN MED. WEST OF E ON P.V.
			5.31			
4.55						
3.52	3.52	1083.916				
2.49						
			7.16			
			6.01	6.01	1077.706	TP#19 T/C WEST SHE. OF MED. 30± ON P.V.
			4.86			
7.59						
6.95	6.947	1084.953				
6.30						

	+	HI	-	ELEV
		1084.853		
			3.44	
			2.81	1082.043
			2.18	
10.14				
9.46	9.457	1091.50		
8.77				
			3.90	
			3.23	1088.27
			2.56	
9.38				
8.49	8.49	1096.76		
7.60				
			3.09	
			2.13	1094.63
			1.17	
5.95				
4.37	4.373	1099.003		
2.80				
			9.65	
			8.15	1090.853
			6.65	
1.97				
1.23	1.23	1092.083		
0.49				

T.P.#20 T/C WHITE PAINT DOT MARKED #20
WEST OF & 30' ON P.V.

T.P.#21 T/C WHITE PAINT DOT

T.P.#22 T/C " " " @ NORTH WEST AT N ON BULL
NOSE

T.P.#23 T/C ON & @ I-10 BRIDGE

	+	HI		=	ELEV	REMARKS
		1092.083 ✓	9.48			
			8.78	8.777	1083.306	T.P.#24 T/C ON MEDIUM WHITE PAINT DOT ON R.V.
			8.07			
1.30						
0.81	0.81	1084.116				
0.32						
			8.00			
			7.54	7.54	1076.576 ✓	T.P.#25 T/C " " " " " "
			7.08			
1.14						
0.68	0.683	1077.259				
0.23						
			8.86			
			8.43	8.43	1068.829	T.P.#26 T/C WEST OF E 30° WHITE PAINT DOT ON R.V.
			8.00			
1.87						
1.26	1.26	1070.089				
0.65						
			10.04			
			9.51	9.51	1060.579	T.P.#27 T/C " " " " " "
			8.98			
2.74						
2.11	2.11	1062.689				
1.48						

	+	HI	-	ELEV.	REMARKS
		1062.689			
			9.14		
			8.57	1054.119	T.P.#28 ROCK PAINTED WHITE @ E/P OF P.V. WEST OF E
			8.00		
3.73					
3.19	3.19	1057.309			
2.65			6.85	Adj 1050.450	
			6.36	1050.949	
			5.87		PANEL # WOOD M.C.H.D. BRASS CAP FLUSH W/PVMT @ INTER. OF YUMA RD & PALO VERDE RD
6.00					
4.60	4.603	1055.552			
3.21					
			8.16		
			6.77	1048.782	T.P.#29 ROCK PAINTED WHITE @ E/P ON YUMA R.
			5.38		
6.21					
4.69	4.69	1053.472			
3.17					
			6.93		
			5.42	1048.052	T.P.#30 Rock " " " "
			3.91		
6.61					
5.30	5.303	1053.355			
4.00					

	+	HI	-	ELEV.	REMARKS
		1053.355			
			6.86		
			5.44	1047.915	T.P.31 Rock @ E/P PAINTED WHITE WEST OF EYEMARD
			4.02		
6.56					
5.04	504	1052.955			
3.52					
			7.31		
			5.88	1047.075	T.P.#32 Rock " " " " " "
			4.46		
5.41					
3.81	3813	1050.888			
2.22					
			8.00		
			6.51	1044.381	T.P.#33 Rock " " " " " "
			5.01		
6.44					
4.75	475	1049.131			
3.06					
			7.54		
			5.95	1043.184	T.P.#34 Rock " " " " " "
			4.35		
3.88					
2.31	2313	1045.497			
0.75					

	+	HI	-	ELEV.	REMARKS
		1045.497			
			4.76		
			3.19	1042.307	T.P.#35 Rock @ E/Painted White West 15' on yard
			1.62		
6.37					
4.83	4.833	1047.14			
3.30					
			6.86		
			5.43	1041.707	T.P.#36 Rock " " " " " "
			4.01		
3.52					
2.06	2.06	1043.767			
0.60					
			5.03		
			3.61	1040.154	T.P.#37 Rock " " " " " "
			2.20		
5.31					
3.75	3.747	1043.901			
2.18					
			5.87		
			4.37	1039.528	T.P.#38 " " " " " "
			2.88		
6.28					
4.84	4.843	1044.371			
3.41					

	+	HI	-	ELEV.	REMARKS	
		1044.371				
			6.86			
			5.34	5.343	1039.028	T.P.#39 ROCK @ E/P PAINTED 1/2" N. OF & ON YUMA RD.
			3.83			
6.56						
5.13	5.13	1044.158				
3.70						
			8.97			
			7.26	7.263	1036.895	T.P.#40 NAIL " " " " " "
			5.56			
5.91						
4.34	4.34	1041.235				
2.77						
			7.36			
			5.63	5.63	1035.605	T.P.#41 NAIL " " " " " "
			3.90			
6.83						
6.32	6.323	1041.928				
5.82						
			6.20	Adj	1036.324	
			5.64	5.64	1036.288	PANEL# WOOD 1/2" REBAR
			5.08			
4.56						
2.97	2.97	1039.258				
1.38						

	+	HI		-	ELEV	REMARKS
		1039.258				
			7.88			
			6.39	6.39	1032.868	T.P. #42 NAIL @ E/P NORTH OF E 15 ^t ON YUMARD.
			4.90			
5.80						
4.15	4.153	1037.021				
2.51						
			7.33			
			5.87	5.867	1031.154	T.P. #43 " " " " " "
			4.40			
10.21						
8.33	8.327	1039.481				
6.44						
			7.29			
			5.69	5.69	1033.791	T.P. #44 " " " " " "
			4.09			
4.51						
3.03	3.03	1036.821				
1.55						
			3.21			
			1.78	1.78	Adj 1035.076 1035.041	T.P. #45 NAIL @ E/P NORTH OF E ON YUMA 80 ^t EAST OF JOHNSON RD.
			0.35			
9.98						
8.24	8.243	1043.784				
6.51						

	+	HI	-	ELEV	REMARKS
		1043.284			
			9.18		
			7.57	7.573 1035.711	T.P.# 46 INAIL 600 ON YUMARD @ NORTH HEDGE OF DIRT RD.
			5.97		
9.41					
7.53	7.533	1043.244			
5.66					
			7.53		T.P.# 47 " " " " " " " "
			5.64	5.637 1037.607	
			3.74		
7.39					
5.60	5.60	1043.207			
3.81					
			10.05		
			8.42	8.42 1034.787	T.P.# 48 " " " " " " " "
			6.79		
3.25					
1.68	1.677	1036.464			
0.10					
			9.89		
			8.41	8.413 1028.051	T.P.# 49 " " " " " " " "
			6.94		
10.09					
8.28	8.277	1036.328			
5.46					

	+	HI	-	E.LEV	REMARKS
		1036.328			
			4.61		
			2.89	1033.438	T.P.#50 NAIL 60 D ONLYUMARD @ NORTH EDGE OF DIRT Rd
			1.17		
9.4	10.05				
7.5	8.28	8.277			
5.6	6.50	1041.715			
			6.51		
			4.93	1036.785	T.P.#51 " " " " " " " "
			3.35		
7.	6.27				
5.	4.53	4.53			
3.	2.79	1041.315			
			10.07		
			8.43	1032.885	T.P.#52 " " " " " " " "
			6.79		
3.	3.57				
1.	2.19	2.187			
0.	0.80	1035.612			
			6.90	Adj 1027.400	
			5.20	1029.812	PANEL# WOOD G.L.O. BRASS CAP SEC. COR. OF 11-12-14-13
			3.50		.20 ABOVE GROUND
16.	14.12				
8.	12.95	12.95			
5.	11.78	1042.822			

	+	HI		-	ELEV	REMARKS
		1042.822				
			5.25			
			4.09	4.093	1038.729	T.P.#53 NAIL
			2.94			
8.61						
7.01	7.01	1045.739				
5.41						
			5.10			
			3.45	3.45	1042.289	T.P.#54 NAIL
			1.80			
9.04						
7.57	7.57	1049.859				
6.10						
			8.11			
			6.65	6.647	1043.212	T.P.#55 NAIL
			5.18			
10.19						
8.98	8.98	1052.192				
7.77						
			3.70			
			2.58	2.583	1049.609	T.P.#56 NAIL
			1.47			
5.93						
4.60	4.60	1054.209				
3.27						

	+	HI		-	ELEV	REMARKS
		1054.209	3.22			
			1.89	1.89	1052.319	T.P.#57 NAIL
			0.56			
8.63						
7.42	7.423	1059.742				
6.22			4.92			
			3.59	3.59	1056.152	T.P.#58 NAIL
			2.26			
8.18						
6.92	6.92	1063.072				
5.66			5.76			
			4.52	4.52	1058.552	T.P.#59 NAIL
			3.28			
8.53						
7.18	7.18	1065.732				
5.83			7.64			
			6.05	6.05	1059.682	T.P.#60 NAIL
			4.46			
7.55						
6.11	6.11	1065.792				
4.67						

	+	HI		-	ELEV	REMARKS
		1065.792				
			7.58			
			6.15	6.15	1059.642	T.P. #61 NAIL
			4.72			
8.31						
6.87	6.867	1066.507				
5.42						
			2.49	1.46	1065.074	
			1.46	1.463	1065.046	PANEL # W010 G.L.O BRASS CAP SEC. COR TIN RSW
			0.44			^{52/51} 511/512 † 1.10 ABOVE GROUND
8.91						
8.00	8.00	1073.046				
7.09						
			6.16			
			5.19	5.19	1067.856	T.P. #62 NAIL 50' SOUTH OF NORTH R/W FENCE OF I-10
			4.22			
8.27						
7.46	7.463	1075.319				
6.66						
			1.99			
			1.35	1.353	1073.966	T.P. #63 NAIL SOUTH TOE M.C.F.C. DIKE
			0.72			
13.56						
13.13	13.133	1087.099				
12.71						

	+	HI	-	ELEV	REMARKS
		1087.099			
			1.91		
			1.49	1085.609	T.P.#64 NAIL 10" FROM TOP OF DIKE ON S. SLOPE
			1.07		
6.44					
5.80	5.80	1091.409			
5.16					
			14.54		
			13.84	1077.572	T.P.#65 NAIL ON NORTH SLOPE OF DIKE
			13.13		
2.27					
1.59	1.59	1079.162			
0.91					
			12.83		
			12.13	1067.032	T.P.#66 NAIL
			11.43		
2.87					
2.15	2.153	1069.185			
1.44					
			6.85		
			5.84	1063.345	T.P.#67 60D NAIL
			4.83		
14.74					
13.63	13.627	1076.972			
12.51					

	+	HI		-	ELEV.	REMARK
		1076.972	2.62			
			1.47	1.473	1075.499	T.P.#68 60D NAIL
			0.33			
759						
621	6.21	1081.709				
4.83						
			4.11			
			2.97	2.97	1078.739	T.P.#69 60D NAIL
			1.82			
983						
8.47	8.473	1087.212				
7.12						
			5.59			
			4.02	4.023	1083.189	T.P.#70 60D NAIL
			2.46			
8.57						
7.09	7.087	1090.276				
5.60						
			4.81			
			3.33	3.33	1086.946	T.P.#71 " "
			1.85			
7.70						
6.19	6.187	1093.133				
4.67						

	+	HI		-	ELEV	REMARKS
		1093.133	5.03			
			3.48	3.483	1089.65	T.P.# 72 600 NAIK
			1.94			
7.97						
6.43	6.43	1096.08				
4.89						
			7.61			
			5.69	5.687	1090.393	T.P.# 73 " " "
			3.76			
11.58						
9.81	9.81	1100.203				
8.04						
			5.78			
			4.11	4.113	1096.09	T.P.# 74 " " "
			2.45			
5.00						
4.49	4.493	1100.583				
3.99						
			7.62	Adj	1093.574	
			7.02	7.02	1093.563	PANEL# W035 G.L.O. BRASS CAP T2N R5W
			6.42			535/536 52/51 4 0.70 ABOVE GROUND. C
10.60						
9.05	9.047	1102.610				
7.49						

	+	HI		-	ELEV.	REMARKS
		1102.610	4.81			
			3.05	3.053	1099.557	T.P. #75 NAIL
			1.30			
9.21						
7.73	7.73	1107.287				
6.25						
			5.31			
			3.51	3.51	1103.777	T.P. #76 NAIL
			1.71			
8.75						
7.47	7.47	1111.247				
6.19						
			5.18			
			3.85	3.85	1107.397	T.P. #77 NAIL
			2.52			
8.02						
6.55	6.547	1113.944				
5.07						
			5.74			
			4.21	4.21	1109.134	T.P. #78 1" X 2" Hub
			2.68			
7.72						
6.57	6.567	1116.301				
5.41						

	+	HI		-	ELEV.	REMARKS
		1116.301	5.24			
			4.05	4.05	1112.251	T.P.# 79 1" X 2" NUB
			2.86			
9.756						
7.648	6.48	1118.731				
6.540						
			4.75	Adj	1115.119	
			3.56	3.56	1115.171	T.P.# 80 "
			2.37			
8.821						
7.681	6.807	1121.978				
6.540						
			5.52			
			4.17	4.167	1117.811	T.P.# 81 "
			2.81			
8.719						
6.5985	5.985	1123.796				
5.478						
			5.29			
			4.19	4.87	1119.609	T.P.# 82 60 D NAIL
			3.08			
8.24						
6.945	6.942	1126.561				
5.60						

	+	HI		-	ELEV	REMARKS
		1126.551	5.34			
			4.01	4.007	1122.544	T.P.#83 60D NAIL
			2.67			
8.48						
7.02	7.02	1129.564				
5.56			5.44			
			4.13	4.127	1125.437	T.P.#84 60D NAIL
			2.81			
8.92						
7.35	7.35	1132.787				
5.78			6.61			
			5.22	5.22	1127.567	T.P.#85 1"X2" Hub
			3.83			
5.65						
4.22	4.22	1131.787				
2.79			5.48			
			4.08	4.083	1127.704	T.P.#86 NAIL
			2.69			
4.91						
4.31	4.31	1132.014				
3.71						

	+	HI		-	ELEV	REMARKS
		1132.014	4.05		1128.548	
			3.495	3.495	1128.519	U.S. COAST AND GEODETIC SURVEY BRASS CAP STAMPED
			2.94			W263 1917 ELEV. = 1128.548
8.49						
7.15	7.15	1135.669				
5.81						
			4.42			
			3.06	3.06	1132.609	T.P.#87 GO D NAIL
			1.70			
8.4						
7.17	7.17	1139.779				
5.73						
			5.42			
			3.99	3.99	1135.789	T.P.#88 GO D NAIL
			2.56			
8.75						
7.19	7.19	1142.979				
5.63						
			5.20			
			3.83	3.83	1139.149	T.P.#89 " "
			2.46			
8.93						
7.31	7.313	1146.462				
5.70						

	+	HI	-	ELEV.	REMARKS
		1146.462			
			5.37		
			3.79	1142.672	T.P. #90 60 NAIL
			2.21		
5.87					
4.35	4.35	1147.022			
2.83					
			5.39		
			3.99	1143.032	T.P. #91 60 NAIL
			2.59		
6.83					
6.16	6.16	1149.192			
5.49					
			6.16	1143.926	
			5.39	1143.799	PANEL # W0 38 1x2 HUB
			4.63		
9.20					
7.94	7.94	1151.739			
6.68					
			5.74		
			4.40	1147.339	T.P. #92 60 NAIL
			3.06		
9.33					
7.58	7.583	1154.922			
5.84					

	+	HI	-	ELEV.	REMARKS
		1154.922			
			7.15	1149.342	
			5.58	1149.412	T.P. #93
			4.01		60 NAIL
8.24		1155.955			
6.62	6.613	1156.025			
4.98					
			3.85	1153.702	
			2.25	1153.772	T.P. #94
			0.66		" "
6.53		1159.618			
5.92	5.916	1159.688			
5.30					
			6.52	1153.768	
			5.85	1153.838	T.P. #95
			5.18		1/2 IN. NEDAR
					AT CROSSROAD
9.08		1161.348			R.L. FANIN
7.58	7.58	1161.418			L.S. #14177
6.08					
			6.32	1156.548	
			4.80	1156.618	T.P. #96
			3.28		60 NAIL
8.25		1163.378			
6.83	6.83	1163.448			
5.41					

	+	H.I		-	ELEV.	REMARKS
		1163.378				
		1163.448	6.73		1158.115	
			5.26	5.263	1158.185	T.P. # 97 60 NAIL
			3.80			
10.12		1166.805				
8.69	8.69	1166.875				
7.26						
			4.34		1163.915	
			2.89	2.89	1163.985	T.P. # 98 " "
			1.44			
8.10		1170.315				
6.40	6.40	1170.385				
4.70						
			5.73		1166.032	
			4.28	4.283	1166.102	T.P. # 99 " "
			2.84			
9.52		1174.115				
8.08	8.083	1174.285				
6.65						
			4.17		1170.922	
			3.19	3.193	1171.092	T.P. # 100 " "
			2.22			
6.40		1176.838				
5.92	5.916	1177.008				
5.43						

	+	H. I	-	ELEV.	REMARKS
		1176.838 1177.008			
			6.01	Adj 1171.312	
			5.55	1171.288	
			5.09	1171.458	PANEL # WO 16 1/2 INCH REBAR
6.06		1176.291			
5.00	5.003	1176.411			
3.95				Adj 1163.152	
			9.26	1168.128	
			8.16	8.163 1168.298	T.P # 101 60 NAIL
			7.07		
3.44		1170.158			
2.03	2.03	1170.328			
0.62					
			7.37	1164.228	
			5.93	5.93 1164.398	T.P # 102 " "
			4.49		
4.88		1167.718			
3.49	3.49	1167.888			
2.10					
			8.66	1160.465	
			7.25	7.253 1160.635	T.P # 103 " "
			5.85		
6.02		1164.918			
4.45	4.453	1165.008			
2.89					

	+	H.I	-	ELEV.	REMARKS
		1164.918 1165.088			
			8.20	1158.278	
			6.64	6.64	1158.448
			5.08		T.P. #104 60 NAIL
3.63		1160.458			
2.18	2.18	1160.628			
0.73				Adj 1149.174	
			12.84	1149.152	
			11.31	11.306	1149.322
			9.77		T.P. #105 60 NAIL
3.06		1151.472			
2.32	2.32	1151.642			
1.58					
			5.70	1146.582	
			4.89	4.89	1146.752
			4.08		T.P. #106 1x2 HUB
4.88		1149.562			
2.98	2.98	1149.732			
1.08					
			5.54	1145.662	
			3.90	3.90	1145.832
			2.26		T.P. #107 60 NAIL
8.35		1152.212			
6.55	6.55	1152.382			
4.75					

	+	H.I		-	ELEV.	REMARKS
		1152.312 1152.382	10.48		1143.492	
			8.72	8.72	1143.662	T.P. #108 60 NAIL
			6.96			
3.05.18		1146.905				
2.03.41	3.413	1147.075				
0.01.65						
			9.61		1139.055	
			7.85	7.85	1139.225	T.P. #109 60 NAIL
			6.09			
3.04.15		1141.465				
2.02.41	2.41	1141.635				
1.00.67						
			10.32		1132.905	
			8.56	8.56	1133.075	T.P. #110 " "
			6.80			
4.04.60		1135.675				
2.02.79	2.79	1135.865				
1.00.98						
			7.33		1130.155	
			5.56	5.56	1130.325	T.P. #111 " "
			3.79			
8.06.74		1135.195				
6.05.06	5.06	1135.365				
4.03.38						

	+	H.I	-	ELEV	REMARKS
		1135.195 1135.365			
			10.90	1125.945	
			9.25	9.25	1126.115
			7.60		T.P. #112 60 NAIL
5.50		1129.005			
3.06	3.06	1129.175			
0.62					
				Adj 1123.665	
			6.30	1123.645	
			5.36	5.36	1123.85
			4.42		PANEL # W0 12 1/2 IN. DIAM
1.95		1126.515			
2.87	2.87	1126.685			
1.79				Adj 1122.005	
			5.44	1122.005	
			4.51	4.51	1122.175
			3.58		U.S. COAST AND GEODETIC SURVEY BRASS CAP STAMPED V. 262 1967 ELEV. = 1122.025
				Adj 1115.171	
6.82				1115.171	1115.171
5.18	5.18	1120.35			1115.171
3.54					1115.171
			8.92		
			7.28	7.28	1113.068
			5.65		T.P. #113 60 NAIL

	+	HI	-	ELEV	REMARKS	35
5.25				1113.068		
3.70	3.70	1116.768				
2.15						
			6.88			
			5.30	1111.468	T.P.#82A 60D NAIL	
			3.72			
2.32						
1.21						
0.11	1.213	1112.681				
			10.68			
			9.85	1102.831	T.P.#83A 60D NAIL	
			9.02			
8.10						
6.785	6.782	1109.613				
5.46						
			3.99			
			2.71	1106.903	T.P.#84A 60D NAIL	
			1.43			
7.355						
6.105	6.103	1113.006				
4.85						
			6.31			
			5.13	1107.873	T.P.#85A 60 D NAIL	
			3.96			

	+	HI	-	ELEV.	REMARKS
0.675				1096.838	
0.385	0.385	1097.223			
0.095					
			14.81		
			14.43	1082.793	T.P.# 90A NAIL
			14.05		
4.34					
3.72	3.723	1086516			
3.11					
			9.785		
			9.225	1077.291	T.P.# 91A 1" X 2" HUB
			8.665		
4.53					
3.82	3.82	1081.111			
3.11					
			12.14		
			11.43	1069.684	T.P.# 92A 60 D NAIL
			10.71		
3.92					
3.13	3.13	1072814			
2.34					
			10.25		
			9.50	1063.314	T.P.# 93A 60 D NAIL
			8.75		

	+	HI	-	ELEV	REMARKS	
3.00				1063.314		
2.28	2.277	1065.591				
1.55						
			7.765			
			7.09	7.088	1058.503	T.P.#94A 60 DNAIL
			6.41			
3.84						
3.165	3.165	1061.668				
2.49						
			7.98	adj	1054.314	
			7.39	7.393	1054.275	PANEL # W O 1 1/2" REBAR
			6.81			
7.85						
7.27	7.267	1061.542				
6.68						
			6.51			
			5.81	5.81	1055.732	T.P.# 95A 60 DNAIL
			5.11			
8.51						
7.30	7.30	1063.032				
6.09						
			5.31			
			4.10	4.103	1058.929	T.P.#96A " "
			2.90			

	+	HI		-	ELEV	REMARKS
					1074961	
1 6.21						
9 4.82	4.82	1079781				
8 3.43						
			464			
			327	3.267	1076514	T.P. 105A 1"X2" Hub
			1.89			
4 8.25						
3 6.87	6.87	1083384				
2 5.49						
			5.21			
			3.88	3.88	1079504	T.P. 106A 1X2 Hub
			2.55			
8 8.25						
6 7.00	7.00	1086504				
5 5.75						
			7.70			
			6.33	6.33	1080174	T.P. 107A 1"X2" Hub
			4.96			
7 9.22						
6 7.83	7.83	1088004				
4 6.44						
			5.43			
			3.92	3.92	1084084	T.P. # 108A 1X2 Hub
			2.41			

	+	HI		-	ELEV	REMARKS
8.98					1084.084	
7.58	7.583	1091.667				
6.19						
			5.89			
			4.55	4.553	1087.114	T.P.# 109A 1" X 2" Hub
			3.22			
8.07						
6.69	6.687	1093.801				
5.30						
			3.73			
			2.35	2.35	1091.451	T.P.# 110A 1 X 2 Hub
			0.97			
7.74						
6.33	6.33	1097.781				
4.92						
			3.78			
			2.33	2.333	1095.448	T.P.# 111A 1 X 2 Hub
			0.89			
7.28						
5.87	5.873	1101.321				
4.47						
			5.56			
			4.10	4.103	1097.218	T.P.# 112A 1 X 2 Hub
			2.65			

	+	HI		-	ELEV	REMARKS
					1097.218	
7.87						
6.46	6.46	1103.678				
5.05						
			6.03			
			4.48	4483	1099.195	T.P.# 113A 1X2 Hub
			2.94			
8.01						
6.62	6.62	1105.815				
5.23						
			5.87			
			4.46	446	1101.355	T.P.# 114A 1X2 Hub
			3.05			
6.62						
5.885	5.882	1107.237				
5.14						
			5.145	Adj	1102.896	
			4.395	4395	1102.842	T.P.# 115A 1X2 REBAR WITH L.S. CAP. 20 ABOVE GROUND
			3.645			
5.26						
3.97	3.97	1106.812				
2.68						
			7.57			
			6.24	6.238	1100.574	T.P.# 115A 1X2 Hub
			4.905			

	±	HI	-	ELEV	REMARKS
5.62				1100.574	
4.14	4.143	1104.717			
2.67					
			7.75		
			6.34	1098.38	TP# 116A 1"X2" HUB
			4.92		
5.59					
4.00	4.00	1102.38			
2.41					
			8.87		
			7.47	1094.913	TP# 117A 1X2 HUB
			6.06		
5.15					
3.71	3.707	1098.62			
2.26					
			8.03		
			6.59	1092.03	TP# 118 60D NAIL
			5.15		
4.84					
3.21	3.21	1095.24			
1.58					
			8.52		
			7.09	1088.15	TP# 119 60D NAIL
			5.66		

	+	HI		-	ELEV	REMARKS
					1088.15	
5.54						
4.13	4.133	1092.283				
2.73						
			8.37			
			6.99	6.993	1085.29	T.P.# 120A 60DNAIL
			5.62			
3.77						
2.74	2.74	1088.03				
1.71						
			3.13			
			2.17	2.168	1085.862	T.P.# 121A 1"X2" HUB
			1.205			
5.12						
3.73	3.733	1089.595				
2.35						
			7.32			
			6.005	6.002	1083.593	T.P.# 122A 1"X2" Hub
			4.68			
5.47						
3.99	3.99	1087.583				
2.51						
			9.71			
			8.25	8.25	1079.333	T.P.# 123A 1"X2" Hub
			6.79			

	+	HI	-	ELEV.	REMARKS
				1079.333	
5.77					
4.35	4.353	1083.686			
2.94					
			7.65		
			6.18	1077.506	TP# 124A 1X2" Hub
			4.71		
5.46					
4.07	4.07	1081.576			
2.68					
			10.99		
			9.66	1076.916	TP# 125A 1"X2" Hub
			8.33		
5.95					
4.535	4.537	1076.453			
3.125					
			8.56		
			7.17	1069.28	TP# 126A 1X2" Hub
			5.79		
5.93					
4.51	4.513	1073.793			
3.10					
			4.37		
			2.88	1070.916	TP# 127A " " " @ T&E OF SLOPE, N EDGE OF D. RD.
			1.38		

	+	HI		-	ELEV	REMARKS
10.56					1070916	
10.19	10.19	1081106				
9.82						
			0.93			
			0.655	0.655	1080451	T.P.# 128A 1X2 Hub
			0.38			
12.19						
11.87	11.87	1092321				
11.55						
			1.07			
			0.785	0.785	1091536	T.P. 129A 1X2 Hub
			0.50			
11.96						
11.64	11.64	1103176				
11.32						
			1.285			
			0.955	0.955	1102221	T.P. 130A 1X2 Hub
			0.625			
11.01						
10.53	10.53	1112751				
10.05						
			2.05			
			1.485	1.483	1111268	T.P. 131A 1X2 Hub
			0.915			

	+	HI	-	ELEV	REMARKS
				1111.268	
11.07					
10.43	10.43	1121.698			
9.79					
			2.25		
			1.55	1120.148	T.P. 132A " " " "
			0.85		
9.875					
9.18	9.178	1129.326			
8.48					
			2.06		
			1.425	1127.899	T.P. 133A " " "
			0.795		
9.46					
8.60	8.602	1136.501			
7.745					
			4.00		
			2.92	1133.581	T.P. 134A " " "
			1.84		
6.445					
5.235	5.237	1138.818			
4.03					
			7.15		
			5.92	1132.898	T.P. 135A " " "
			4.69		

	+	HI		-	ELEV	REMARKS
					1132.898	
.584						
1.458	4.583	1137.481				
3.33						
			8.46			
			7.25	7.247	1130.234	T.P.# 135A 1X2 HUB
			6.03			
2.29						
1.40	1.40	1131.634				
0.51						
			6.64			
			5.76	5.757	1125.877	T.P.# 137A 1X2 HUB
			4.87			
7.625						
7.185	7.183	1133.060				
6.74						
			4.96		1128.548	
			4.58	4.583	1128.477	U.S. COAST AND GEODETIC SURVEY BRASS CAP
			4.21			STAMPED W263 1947 ELEV.=1128.548

	+	HI		-	ELEV	
5.30					1065.076	
3.81	3.293	1062.939				
2.74						
			2.78			
			2.10	2.10	1066.839	T.P. #1
			1.42			60 NAIL
8.24						
6.91	6.91	1073.749				
5.55						
			5.58			
			4.24	4.26	1069.489	T.P. #2
			2.97			60 NAIL
7.25						
5.95	5.95	1075.292				
4.36						
			6.50			
			5.09	5.09	1070.202	T.P. #3
			3.65			" "
6.30						
4.51	4.813	1075.015				
3.33						

PANEL # W010 GLO BRASS CAP SEC. COR. TIN RSW
 52/51
 511/512 1/10 ABOVE GROUND

T.P. #1 60 NAIL

T.P. #2 60 NAIL

T.P. #3 " "

	+	H.I	-	ELEV.	REMARKS
		1075.015			
			6.10		
			5.35	1069.665	T.P.# 4 60 NAIL
			3.80		
7.88					
6.51	6.513	1076.178			
5.15					
			6.79		
			3.45	1070.728	T.P.# 5 1X2 HUB
			4.11		
5.55					
4.60	4.60	1075.328			
3.65					
			6.00		
			2.85	1068.475	T.P.# 6 " "
			5.41		
5.02					
3.66	3.66	1072.135			
2.30					
			11.46		
			10.07	1062.065	T.P.# 7 1X2 HUB N.W OF FENCE POST
			2.28		W. OF P. LINE ROAD
3.20					
2.27	2.27	1064.535			
0.74					

	+	H.I		-	ELCV	REMARKS
		1064.335	14.63			
			13.19	13.19	1051.145	T.P. #8 1x2 HUB
			11.75			
2.81						
1.51	1.51	1052.655				
0.21						
			7.06			
			5.88	5.88	1046.775	T.P. #9 " "
			4.70			
8.73						
7.56	7.563	1054.338				
6.40						
			2.65			
			1.76	1.76	1052.578	T.P. #10 " "
			0.87			
7.24						
6.50	6.80	1059.378				
6.34						
			6.27			
			5.77	5.766	1053.612	PANEL # W009 G.E. D. BRASS CAP
			5.26			C.9 ABOVE GROUND
6.23						
5.73	5.726	1059.338				
5.22						

	+	H.I		-	ELEV	REMARKS
		1059.338	3.66			
			2.75	2.75	1056.588	T.P.#11 1X2 HUB
			1.84			
8.37						
7.05	7.05	1063.638				
5.73						
			5.88			
			4.53	4.53	1059.108	T.P.#12 " "
			3.18			
7.33						
5.87	5.87	1064.978				
4.41						
			5.83			
			4.41	4.41	1060.568	T.P.#13 " "
			2.99			
13.26						
12.02	12.023	1072.591				
10.79						
			4.75			
			8.53	8.533	1064.058	T.P.#14 1X2 HUB
			7.32			N. SIDE OF FREEWAY
5.43						AT R/W FENCE
4.93	4.933	1068.991				
4.44						

	+	H.I.		-	ELEV.	REMARKS
		1068.991	2.10			
			1.48	1.48	1067.511	T.P. # 15 1 x 2 HUB TOE OF DIKE
			0.86			
14.20						
13.94	13.94	1081.451				
13.68			1.74			
			1.36	1.36	1080.091	T.P. # 16 1 x 2 HUB
			0.98			
9.77						
9.47	9.47	1089.561				
9.17						
			14.31			
			13.81	13.81	1075.751	T.P. # 17 " "
			13.31			
4.50						
4.05	4.05	1079.801				
3.60						
			14.43			
			13.89	13.89	1065.911	T.P. # 18 " "
			13.35			
4.77						
4.36	4.36	1070.271				
3.95						

	+	H.I	-	ELEV.	REMARKS
		1070.271			
			14.09		
			13.22	13.22 1057.051	T.P. #19 1x2 HIB
			12.35		
8.74					
7.59	7.59	1064.641			
6.44					
			4.84		
			3.63	3.63 1061.011	T.P. #20 " "
			2.42		
9.77					
8.42	8.42	1069.431			
7.07					
			2.24		
			1.40	1.40 1068.031	T.P. #21 " "
			0.56		
13.27					
12.24	12.236	1080.267			
11.20					
			1.72		
			1.12	1.12 1079.147	T.P. #22 60 NAIL
			0.52		
11.94					
11.08	11.08	1090.227			
10.22					

	+	H.I		-	ELEV.	REMARKS
		1090.227	3.45			
			2.60	2.60	1087.627	T.P.# 23 60 NAIL
			1.75			
6.91						
6.01	6.01	1093.637				
5.11						
			5.00	H.I	1088.410	
			4.22	4.22	1089.417	PANEL # W0 36 1/2 in REBAR 0.3 ABOVE ground
			3.44			
8.60						
7.00	7.00	1096.417				
5.40						
			4.79			
			3.30	3.30	1093.117	T.P.# 24 60 NAIL
			1.81			
9.90						
8.22	8.22	1101.337				
6.54						
			6.34			
			4.73	4.733	1096.604	T.P.# 25 1x2 HUB
			3.13			
7.40						
5.91	5.906	1102.516				
4.41						

	+	H.I		-	ELEV.	REMARKS
		1102.510	5.85			
			4.42	4.42	1098.09	T.P.# 26 1x2 HUB
			2.99			
6 8.76						
6 7.38	7.383	1105.473				
6 6.01						
			8.73			
			7.38	7.38	1098.093	T.P.# 27 " "
			6.03			
8.58						
6.68	6.68	1104.773				
4.78						
			9.22			
			7.62	7.62	1097.153	T.P.# 28 " "
			6.02			
7.10						
5.40	5.40	1102.553				
3.70						
			6.04			
			4.42	4.42	1098.133	T.P.# 29 " "
			2.80			
7.37						
5.73	5.73	1103.863				
4.09						

	+	H.I	-	ELEV.	REMARKS
		1103.863			
			7.16		
			5.97	1097.893	T.P.# 30 1x2 HUB
			4.78		
3.77					
3.27	3.27	1101.163			
2.77					
			8.35	1093.51	
			7.56	1093.60	PANEL # W035 G.L.O. BRASS CAP TEN RSW
			6.78		^{52.151} 4 0.70 ABOVE GROUND Adj 1093.574
				1035.076	
				1035.041	T.P.# 45 NAIL @ E/P NORTH OF 2 ON YUMARD 80° EAST OF JOHNSON RD
7.19					
6.10	6.102	1041.141			
5.015					
			5.345		
			4.11	1037.033	T.P.# 1 60 D. NAIL @ EAST E/P OF JOHNSON
			2.87		
4.72					
3.47	3.47	1040.503			
2.22					
			6.05		
			4.76	1035.743	T.P.# 2 " " " " " "
			3.47		

	+	HI		-	ELEV	REMARKS
12.35					1035.743	
10.88	10.882	1046.625				
9.415						
			4.10			
			2.79	2.792	1043.833	T.P.#3 60D NAIL @ EAST E/P OF JOHNSON
			1.485			
9.76						
8.33	8.33	1052.163				
6.90						
			5.90			
			4.47	4.473	1047.69	T.P.#4 " " " " " " "
			3.05			
9.93						
8.51	8.513	1056.203				
7.10						
			5.75			
			4.39	4.392	1051.811	T.P.#5 " " " " " " "
			3.035			
8.28						
6.93	6.927	1058.738				
5.57						
			4.27			
			2.83	2.13	1055.908	T.P.#6 60D NAIL @ WEST E/P OF JOHNSON @ TOE OF OVER PASS RAMP
			1.39			

	+	HI		-	ELL/	REMARKS	60
10.45					1055.908		
9.52	9.52	1065.428					
8.59			1.41				
			0.81	0.81	1064.618	T.P.#7 P.K. NAIL WEST E/P ON JUNCTION OVER PASS	
			0.21			RAMP	
10.62							
9.96	9.957	1074.575					
9.29	-		2.03				
			1.615	1.617	1072.758	T.P.#8 " " EAST " " " " " "	
			1.155				
10.39							
9.73	9.733	1082.691					
9.08			1.69				
			1.225	1.222	1081.459	T.P.#9 P.K. NAIL @ EAST E/P ON OVER PASS	
			0.75				
11.22							
10.48	10.48	1091.949					
9.74			1.80				
			1.03	1.032	1090.917	T.P.#10	
			0.265				

	+	HI	-	ELEV	
				1010.917	
7.87					
6.925	6.925	1097842			
5.98					
			6.465	adj 1140.208	
			5.66	5.658	1012.184
			4.86		PANEL # W032
0.775	-				
0.505	0.507	1092.691			
0.24					
			13.77		
			13.60	13.598	1079.093
			13.425		T.P. = 11 60 DNAIL
0.90					
0.66	0.66	1079.753			
0.42					
			13.05		
			12.83	12.832	1066.921
			12.615		T.P. # 12 60 DNAIL
3.67					
2.285	2.285	1069.206			
0.90					
			9.47		
			7.78	7.783	1061.423
			6.10		T.P. # 13 " " "

	+	HI		-	ELEV	REMARKS
6.74					1061.423	
5.28	5.283	1066.706				
3.83			6.50			
			5.09	5.093	1061.513	T.P.#14 60 DNAIL
			3.69			
6.95						
5.54	5.54	1067.153				
4.13			6.56			
			5.01	5.013	1062.14	T.P.#15 " " "
			3.47			
8.22						
6.89	6.887	1069.027				
5.55			3.785			
			2.565	2.567	1066.46	T.P.#16 " " "
			1.35			
10.73						
9.505	9.503	1075.903				
8.275			5.165			
			3.885	3.885	1072.078	T.P.#17 " " " "
			2.605			

	+	HI		-	ELEV	REMARKS
					1072.073	
5.61						
4.32	4.32	1076.38				
3.03						
			3.22			
			1.93	1.93	1074.463	T.P.#18 60 DNAIL
			0.64			
7.92'						
6.59	6.593	1081.061				
5.27						
			2.80			
			1.545	1.545	1079.516	T.P.#19 " " "
			.029			
7.54						
6.265	6.265	1085.781				
4.99						
			5.91			
			4.15	4.15	1081.031	T.P.#20 " " "
			2.39			
5.99						
4.37	4.373	1086.004				
2.76						
			6.18			
			4.65	4.65	1081.354	T.P.#21 " " "
			3.12			

	+	HI		-	ELEV	
5.45					1081.354	
4.61	4.61	1085.904				
3.77						
			5.01		1081.804	
			4.17	4.17	1081.714	PANEL # W031 1X2 HUB
			3.33			
8.685						
7.32	7.322	1089.116				
5.96						
			7.63			
			6.12	6.12	1084.196	T.P. # 22 60 D NAK @ S.E/P OF VAN BUREN
			4.61			
7.27						
5.80	5.80	1088.716				
4.33						
			5.66			
			3.73	3.73	1085.066	T.P. # 23 " " " " " " " "
			1.81			
6.93						
5.53	5.533	1090.599				
4.14						
			5.82			
			4.27	4.27	1086.329	T.P. 24 " " " " " " " "
			2.72			

	+	HI		-	ELEV	REMARKS	65
5 7.13					1086.33		
4 5.67	5.67	1091.999					
3 4.21							
			5.44				
			3.90	3.817	1088.102	T.P.# 25 60 D NAIL @ S.E/P OF VANBUREN	
			2.35				
2 7.41							
1 5.93	5.927	1094.029					
4 4.44							
			5.42				
			4.13	4.13	1089.899	T.P.# 26 " " " " " "	
			2.84				
1 7.30							
2 5.80	5.80	1095.699					
4 4.30							
			5.57				
			4.04	4.043	1091.656	T.P.# 27 " " " " " "	
			2.52				
6 8.16							
5 6.545	6.542	1098.198					
4 4.92							
			5.48				
			3.89	3.81	1094.308	T.P.# 28 " " " " " "	
			2.30				

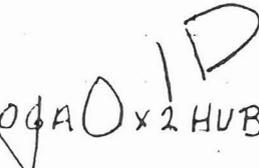
	+	HI		-	ELEV
					1094.308
7.55					
5.89	5.887	1100.195			
4.22					
			5.51		
			3.98	3.983	1096.212
			2.46		
6.83					
5.75	5.75	1101.962			
4.67					
			2.67	adj	1100.181
			1.78	1.78	1100.182
			0.89		
SEE BOOK # 237 PAGE 2-9					
					1147.322
8.99					
7.79	1.79	1157.112			
6.59					
			10.68		
			9.13	9.13	1147.922
			7.58		
9.09					
7.61	7.61	1155.592			
6.13					

REMARKS 66

TP# 29 60 DNAIL @ S. E. CORNER OF VAN BUREN

CHECK IN TO T.P.# 14 T/C @ BULL NOSE @ INTER. P.V. #
VAN BUREN ON PALO VERDE NORTH BULL NOSE
ELEV = 1100.157 Adj 1100.184

T.P.# 105 60 DNAIL 134' SOUTH BY 18' EAST OF
SEC. COR ⁵²⁶¹⁵²⁴ 5261525 @ EAST EDGE OF T.P. # 10

T.P.# 106A  x 2 HUB

	+	H.I.		-	ELEV.	REMARKS
		1155.592	4.30			
			2.50	2.50	1153.092	T.P.# 107A 1x2 HUB
			0.70			
7.93						
6.15	6.15	1159.242				
4.37			7.79		1153.050	
			6.19	6.186	1153.416	T.P.# 108A " "
			4.58			
5.71						
4.41	4.413	1157.824				
3.12						
			3.01		1155.639	
			1.83	1.83	1155.944	T.P.# 109A " "
			0.65			
9.27		1163.739				
8.10	8.10	1164.099				
6.93						
			4.91		1160.009	
			3.73	3.73	1160.369	T.P.# 110A 1x2 HUB
			2.55			
6.82		1165.669				
5.66	5.66	1166.029				
4.50						

VOID

	+	H.I. 1165.669 1166.029	-	ELEV.	REMARKS
			3.66	1163.559	
			2.10	2.10	T.P.# 111A 1 x 2 HUB
			0.54		
5.64		1167.889			
4.32	4.32	1168.249			
3.00					
			3.04	1166.000	
			1.80	1.803	T.P.# 112A " "
			0.57		
4.58		1169.556			
3.47	3.47	1169.916			
2.36					
			5.42	1165.536	
			4.02	4.02	T.P.# 113A " "
			2.62		
8.42		1172.656			
7.12	7.12	1173.016			
5.82					
			4.46	1169.779	
			2.86	2.866	T.P.# 114A 1 x 2 HUB
			1.28		
9.06		1177.426			
7.64	7.636	1177.786			
6.21					

	+	H.I.	-	ELEV	REMARKS
		1177.426 1177.786			
			5.79	1171.95	
			5.51	5.51 1172.276	PANEL # W0 37
			5.23		
7.00		1177.016			
5.70	5.70	1177.976			
4.40					
			7.13	1171.81	
			5.81	5.80 1172.17	T.P.# 115A 1x2 HUB
			4.48		
3.97		1174.66			
2.85	2.85	1175.02			
1.73					
			9.74	1166.79	
			7.87	7.87 1167.15	T.P.# 116A " "
			6.30		
3.83		1169.25			
2.46	2.46	1169.61			
1.09					
			10.74	1160.14	
			9.11	9.11 1160.54	T.P.# 117A 1x2 HUB
			7.48		
4.91		1163.613			
3.47	3.473	1163.973			
2.04					

G.L.O BRASS CAP
.25 BELOW GROUND

T.P.# 115A 1x2 HUB

T.P.# 116A " "

T.P.# 117A 1x2 HUB

	+	H.I	-	ELEV	REMARKS
		1163.613 1163.973			
				8.44	
				7.02	
			7.02	1156.953	T.P.# 118A 1 x 2 HUB
				5.60	
5.92		1161.386			
4.79	4.793	1161.740			
3.67					
				8.37	
				7.01	
			7.006	1154.774	T.P.# 119A " "
				5.64	
6.90		1159.94			
5.56	5.56	1160.30			
4.22					
				10.57	
				9.15	
			9.15	1151.15	T.P.# 120A BRIDGE SPIKE
				7.73	
4.80		1154.29			
3.50	3.50	1154.65			
2.20					
				10.48	
				9.04	
			9.013	1145.607	T.P.# 121A 1 x 2 HUB
				7.61	
4.85		1148.717			
3.47	3.47	1149.077			
2.09					

	+	H.I		-	ELEV.	REMARKS
		1148.717 1149.077				
			11.18		1139.27	
			9.50	9.50	1139.577	T.P.# 122A 1X2 HUB
			7.82			
4.77		1142.80				
3.58	3.583	1143.16				
2.40						
			4.28		1139.387	
			3.41	3.413	1139.747	T.P.# 123A " "
			2.55			S. SIDE OF WASH
5.96		1144.10				
4.71	4.713	1144.40				
3.47						
			11.78		1133.89	
			10.21	10.21	1134.25	PANEL # W013
			8.94			G.L.O. BRASS CAP 0.50 BELOW GROUND
8.23		1140.70				
6.87	6.87	1141.12				
5.51						
			7.00		1135.11	
			5.65	5.65	1135.47	T.P.# 124A 1X2 HUB
			4.30			
3.82		1137.58				
2.47	2.47	1137.94				
1.12						

	+	H. I.	-	ELEV.	REMARKS
		1137.58 1137.94			
			9.55	1129.464	
			8.12	1129.824	T.P.# 125A 1x2 HUB
			6.68		
5.34		1133.21			
3.75	3.746	1133.57			
2.15					
			9.20	1125.607	
			7.60	1125.947	T.P.# 126A " "
			6.01		
6.85		1130.777			
5.37	5.37	1131.337			
3.89					
			7.61	1124.841	
			6.14	1125.201	T.P.# 127A 1x2 HUB S. SIDE of TONOPAH RD.
			4.66		
8.97		1132.331			
7.49	7.49	1132.691			
6.01					
			7.19	1126.651	
			5.68	1127.011	T.P.# 128A 60 NAIL N. SIDE of TONOPAH RD
			4.17		
7.48		1132.497			
5.85	5.846	1132.857			
4.21					

	+	H.I	-	ELEV.	REMARKS
		1132.497 1132.857			
			7.25	1126.377	
			5.62	1127.234	T.P.# 129A 60 WAIN
			3.99		
5	7.55	1132.873			
3	6.00	5.996 1133.233			
2	4.44				
			6.25	1128.19	
			4.68	1128.55	T.P.# 130A " "
			3.12		
	6.01	1131.20			
	5.6.07	6.07 1134.62			
	3.4.13				
			4.51	1130.477	
			3.78	1130.834	PANEL # WO 34 1 x 2 HUB FLUSH
			3.06		
8	4.63	1134.393			
7	3.92	3.916 1134.753			
6	3.20				
			5.41	1127.413	
			4.98	1127.773	U.S. COAST AND GEODETIC SURVEY BRASS CAP STAMPED
			4.55		Y 263 ELEV. = 1128.141

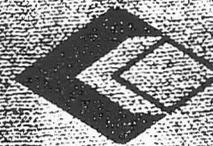
	+	HI	-	ELEV	REMARKS	74
7.26 6.51 5.76	6.51	1135.451		1128.941	US. COAST AND GEODETIC SUR. 1/2" BRASS CAP STAMPED Y 263 ELEV. = 1128.941	
			8.11 7.37 6.63	1128.081	T.P. #131A 60 NAIL	N. SIDE OF TONGAH RD
6.27 4.69 3.12	4.693	1132.774				
			5.91 4.31 2.71	1128.464	T.P. #132A 60 NAIL	
8.65 6.92 5.18	6.916	1135.328				
			6.12 4.42 2.70	1130.907	T.P. #133A	
7.05 5.44 3.83	5.44	1136.407				
			6.40 4.70 3.00	1131.707	T.P. #134A 1X2 HUB	N. SIDE OF TONGAH RD

	+	H.I		-	LCEV.	REMARKS
6.46					1131.707	
4.49	4.49	1136.197				
2.52						
			4.28			
			2.83	2.83	1133.367	T.P.# 135A 60 NAIL
			1.38			
6.69						
5.17	5.173	1138.54				
3.66						
			7.04			
			5.56	5.56	1132.98	T.P.# 136A " "
			4.08			
8.57						
6.79	6.793	1139.773				
5.02						
			5.59			
			4.07	4.073	1135.70	T.P.# 137A " "
			2.56			
7.73						
6.19	6.193	1141.893				
4.66						
			6.60			
			5.10	5.10	1136.793	T.P.# 138A " "
			3.60			

	+	H.I		-	ELEV.	REMARKS
7.93					1136.793	
6.33	6.33	1142.123				
4.73						
			7.56			
			6.07	6.066	1137.057	T.P.# 129A 60 NAIL
			4.57			
5.59						
5.32	5.32	1142.377				
5.05						
			4.81			
			4.37	4.37	1138.007	
			3.93			
						U.S. COAST AND GEODETIC SURVEY BRASS CAP STAMPED Z 263 ELEV. = 1137.99

 **LIETZ**
SINCE 1882

237

 **LIETZ**
SINCE 1882

ENGINEERS FIELD BOOK

No. 8752-30

BROOKS, HERSEY & ASSOCIATES, INC.
5246 SOUTH 40th STREET
Property of PHOENIX, ARIZONA 85040

Address

Telephone

INDEX

PANEL PT	PAGE	PANEL PT	PAGE
W037	4	W044	46
W013	6	W025	52
W034	8	W047	55
Y263	9	W024	63
W014	10	W043	68
W015	13	1360.37	68
W033	15	1367.20	68
W037	16	1367.94	69
W040	18	1399.36	70
W039	22	W022	71
W015	24	W044	74
W016	24	W046	75
W041	28	W042	76
W018	31	W045	77
W019	34	W043	79
W020	36		
517 N 1/4 Cor	38		
W021	39		
W039	42		
W021	43		
W034	45		

This Book is manufactured of a High Grade
50% Rag Paper having a Water Resisting Surface,
and is sewed with Nylon Waterproof Thread.

M. HOIN
R. SAVAGE

8+
#230

	+	HI		ELEV	REMARKS
9.34				1149.152	
8.00	7.997	1157.149			T.P. # 105 60 D NAI 34' SOUTH BY 18'
6.65					EAST OF SEC. COR. ⁵²⁵ 525 & SEE BOOK # 230
			10.715		PAGES 66 TO 73 Adj 1149.174
			9.33	9.332 1147.817	T.P. 106A 1X2 HUB
			7.95		
8.785					
7.76	7.758	1155.575			
6.53					
			4.71		
			2.06	2.66 1152.915	T.P. 107A 1X2 HUB
			0.62		
7.68					
5.89	5.887	1158.802			
4.09					
			7.50		
			5.92	5.927 1152.035	T.P. 108A 1X2 HUB
			4.33		
5.60					
4.22	4.222	1157.107			
2.845					
			2.74		
			1.645	1.645 1155.462	T.P. 109A " "
			0.35		

	+	HI		-	ELEV.	
9.145					1155.462	
7.88	7.88	1163.312				
6.615			4.60			
			3.52	3.52	1159.822	T.P. 110 A 1X2 HUB
			2.44			
6.84						
5.38	5.382	1165.204				
3.925			3.085			
			1.815	1.817	1163.387	T.P. 111 A " "
			0.55			
5.39						
4.08	4.08	1167.467				
2.77			2.82			
			1.57	1.573	1165.894	T.P. 112 A " "
			0.33			
4.61						
3.30	3.303	1169.197				
2.00			5.06			
			3.845	3.845	1165.352	T.P. 113 A " "
			2.63			

	+	HI		-	ELEV	REMARKS
					1165.352	
8.45						
6.87	6.867	1172.219				
5.28						
			3.91			
			2.61	2.61	1169.609	T.P. # 114A 1X2 Hub
			1.31			
9.58						
8.585	8.588	1178.197				
7.60						
			7.18		1171.730	
			6.475	6.475	1171.722	PANEL # W037 GALV BRASS CAP SEC. CORNER OF
			5.77			24/19 ± 0.25 BLOW GROUND
7.29						
6.15	6.147	1177.869				
5.00						
			7.72			
			6.25	6.247	1171.622	T.P. 115A 1X2 Hub
			4.77			
3.90						
2.70	2.70	1174.322				
1.50						
			9.20			
			7.71	7.71	1166.612	T.P. 116A " "
			6.22			

	+	HI		-	ELEV	REMARKS
					1166.612	
3.78						
2.43	2.427	1169.039				
1.07						
			10.73			
			9.075	9.078	1159.961	T.P. 117A 1X2 HUB
			7.43			
5.16						
3.79	3.787	1163.748				
2.41						
			8.78			
			7.34	7.337	1156.411	T.P. 118A 1X2 HUB
			5.89			
5.93						
4.80	4.80	1161.211				
3.67						
			8.385			
			7.01	7.01	1154.201	T.P. 119A 1X2 HUB
			5.635			
6.59						
5.35	5.353	1159.554				
4.12						
			10.47			
			8.95	8.947	1150.607	T.P. 120A BRIDGE SPIKE
			7.42			

	+	HI		-	ELEV	
4.605					1150.607	
3.305	3.305	1153.912				
2.005						
			10.55			
			9.12	9.12	1144.792	TP 121A 1X2 Hub
			7.69			
4.82						
3.445	3.445	1140.237				
2.07						
			11.14			
			9.47	9.47	1138.767	T.P. 122A 1X2 Hub
			7.80			
4.43						
3.375	3.375	1142.142				
2.32						
			4.19			
			3.20	3.20	1138.142	T.P. 123A 1X2 Hub
			2.21			
5.975						
4.72	4.722	1143.664				
3.47						
			11.50		1133.435	
			10.22	10.223	1133.441	
			8.95			

PANEL W/O 13 GLO BRASS CAP SEC. COR OF
 25130
 36131 + 0.50 BELOW GROUND

	+	HI		-	ELEV	REMARKS
					1133.441	
8.445						
7.13	7.132	1140.573				
5.82						
			7.32			
			5.92	5.917	1134.656	T.P. # 124 A 1X2 HUB
			4.51			
3.65						
2.245	2.245	1136.901				
0.84						
			9.28			
			7.90	7.897	1129.004	T.P. # 125 A " "
			6.51			
5.35						
3.76	3.76	1132.764				
2.17						
			9.22			
			7.625	7.622	1125.142	T.P. # 126 A 1X2 HUB
			6.02			
6.54						
5.06	5.06	1130.202				
3.58						
			7.31			
			5.82	5.82	1124.382	T.P. # 127 A " "
			4.33			

	+	HI		-	ELEV	REMARKS
					1124.382	
8.80						
7.31	7.313	1131.695				
5.83						
			7.00			
			5.50	5.50	1126.95	T.P.# 128A 60 D NAIL
			4.00			
7.71						
6.01	6.007	1132.202				
4.30						
			7.35			
			5.78	5.78	1126.422	T.P.# 129A 60 D NAIL
			4.21			
7.30						
5.60	5.597	1132.019				
3.89						
			5.705			
			4.275	4.277	1127.742	T.P.# 130A " "
			2.85			
8.34						
6.38	6.38	1134.122				
4.42						
			4.80			
			4.10	4.10	1130.022	PANEL # W034 1X2 Hub FLUSH
			3.40			

	+	HI		-	ELEV
4.565					1130.022
3.865	3.865	1133.887			
3.165			5.37		
			4.925	4.927	1128.910
			4.485		
10.10					1131.707
9.00	9.00	1140.707			
7.90			5.23		
			4.02	4.02	1130.687
			2.81		
10.75					
9.055	9.055	1145.742			
7.36			4.44		
			2.75	2.75	1142.992
			1.06		
9.405					
7.76	7.762	1150.754			
6.12			3.62		
			2.085	2.083	1148.671
			0.545		

REMARKS

U.S. COAST AND GEODETIC SURVEY BRASS CAP
STAMPED Y263 ELEV=1128.941

T.P.# 134A 1X2 Hub N. SIDE OF TONOPAH RD
SEE BOOK # 230 PAGE # 74 ADJ 1131.700

T.P.# 1 60 NAIL

T.P.# 2 " "

T.P.# 3 " "

	+	H. I	-	ELEV.	REMARKS
8.53				1148.671	
6.96	6.96	1155.631			
5.39					
			3.52		
			1.90	1153.731	T.P. # 4 60 NAIL
			0.28		
9.14					
7.61	7.61	1161.341			
6.08					
			3.87		
			2.405	1158.936	T.P. # 5 " "
			0.94		
9.97					
8.16	8.163	1167.099			
6.36					
			5.76		
			4.33	1162.767	T.P. # 6 " "
			2.905		
8.06					
7.30	7.30	1170.067			
6.54					
			5.13	Adj 1165.636	
			4.43	1165.637	PANEL # W014 G.L.O. BRASS CAP
			3.73		0.50 ABOVE GROUND

	+	H.I		-	ELEV.	REMARKS
8.465					1165.637 ;	
7.105	7.106	1172.743				
5.75			3.965			
			2.64	2.64	1170.103 ;	T.P.# 7 60 NAIL
			1.315			
8.75						
7.25	7.25	1177.353				
5.75			5.60			
			4.19	4.19	1173.163	T.P.# 8 " "
			2.78			
5.23						
3.825	3.825	1176.988				
2.42			4.05			
			2.62	2.616	1174.372	T.P.# 9 " "
			1.18			
9.705						
8.35	8.353	1182.725				
7.005			7.62			
			6.285	6.285	1176.44	T.P.# 10 60 NAIL
			4.95			

	+	H.I.		-	ELEV.	REMARKS
9.265					1176.44	
7.645	7.645	1184.085				
6.025			4.82			
			3.25	3.25	1180.835	T.P.# 11 60 NAIL
			1.68			
7.55						
6.205	6.202	1187.037				
4.85			4.45			
			3.13	3.133	1183.904	T.P.# 12 " "
			1.82			S. OF HOLDING PEN
8.04						
6.41	6.41	1190.314				
4.78			5.33			
			3.72	3.723	1186.591	T.P.# 13 " "
			2.12			
6.77						
5.205	5.205	1191.796				
3.64			2.87			
			2.23	2.23	1189.566	T.P.# 14 60 NAIL
			0.59			

	+	H.I		-	ELEV.	REMARKS
9.065					1189.566	
7.60	7.602	1197.168				
6.14						
			5.20			
			3.72	3.72	1193.448	T.P.# 15 60 NAIL
			2.24			
7.12						
6.72	6.72	1200.168				
6.32						
			5.35	Adj	1195.212	
			4.96	4.963	1195.205	PANEL # W6 15
			4.58			
5.77						
4.23	4.233	1199.438				
2.70						
			8.20			
			6.71	6.71	1192.728	T.P.# 16 T/C IN MED WEST OF E WHITE PAINT SPOT ON P.V.
			5.22			
3.37						
1.88	1.88	1194.608				
0.39						
			8.27			
			6.78	6.783	1187.825	T.P.# 17 T/C IN MED WEST OF E P.V. WHITE PAINT SPOT
			5.30			

MARICOPA COUNTY
HIGHWAY DEPT BRASS CAP
IN H.H. 0.62 BELOW LID

WEST OF E WHITE PAINT
SPOT ON P.V.

WEST OF E P.V. WHITE
PAINT SPOT

	+	H.I.		-	ELEV.	REMARKS
3.46					1187.825	
1.895	1.895	1189.72				
0.33						
			8.98			
			7.465	7.465	1182.255	# T.P. 17 T/C IN MED
			5.95			WEST OF E P.V. WHITE PAINT SPOT
2.51						
1.51	1.51	1183.765				
0.51						
			8.77			
			7.74	7.74	1176.025	# T.P. 18 T/C IN MED
			6.71			WEST OF E P.V. WHITE PAINT SPOT
2.145						
1.125	1.125	1177.15				
0.105						
			8.14			
			7.08	7.08	1170.07	# T.P. 19
			6.02			" " " "
3.39						
2.19	2.19	1172.26				
0.99						
			8.01			
			6.75	6.745	1165.515	# T.P. 20
			5.475			" " " "

	+	H.I.	-	ELEV.	REMARKS
				1165.515	
3.485					
2.165	2.162	1167.677			
0.835					
			7.075		
			5.725	1161.954	T.P. # 21 T/C IN MED WEST OF & P.V. WHITE
			4.37		PAINT SPOT.
4.32					
2.61	2.607	1164.561			
0.89					
			8.92		
			7.34	1157.221	T.P. # 22 " " " " "
			5.76		
3.16					
1.72	1.72	1158.941			
0.28					
			8.15		
			6.87	1152.071	T.P. # 23 " " " " "
			5.59		
3.45					
2.45	2.45	1154.521			
1.45					
			7.97	Adj 1147.637	PANEL # W033 BRASS CAP FLUSH W/PVMT @
			6.90	1147.621	INTER. OF P.V. & MC DOWELL SEE BOOK # 230 PAGE 5
			5.83		ELEV. 1147.626
					Adj 1147.637

	+	HI		-	ELEV.	REMARKS	16
7.47							
6.215	6.215	1177.937			1171.722	PANEL # W037 G.L.O. BRASS CAP SEC. CORNER OF	
4.96						24 19	
			5.365			25 30 4 0.25 BLOW GROUND SEE THIS BOOK PAGE 4	
			4.165	4.167	1173.77		
			2.97				
8.08							
6.50	6.50	1180.27				T.P.# 1 60 D NAIL	
4.92							
			3.09				
			1.60	1.603	1178.667	T.P.# 2 60 D NAIL	
			0.12				
9.55							
8.16	8.16	1186.827					
6.77							
			6.175				
			4.84	4.838	1181.989	T.P.# 3 " " "	
			3.50				
7.23							
5.83	5.833	1187.822					
4.44							
			3.46				
			2.30	2.297	1185.525	T.P.# 4 " " "	
			1.13				

	+	HI		-	ELEV	REMARKS
5.78					1185.525	
4.39	4.393	1189.918				
3.01						
			3.25			
			1.905	1.902	1188.016	T.P.# 5 60 D NAIL
			0.55			
9.665						
8.275	8.277	1196.293				
6.89						
			3.14			
			1.69	1.693	1194.60	T.P.# 6 " " "
			0.25			
8.47						
6.84	6.84	1201.44				
5.21						
			6.97			
			5.47	5.473	1195.967	T.P.# 7 " " "
			3.98			
8.80						
7.30	7.297	1203.264				
5.79						
			4.44			
			2.95	2.952	1200.312	T.P.# 8 " " "
			1.465			

	+	HI		-	ELEV	REMARKS
8.885					1200.312	
7.425	7.425	1207.737				
5.965			5.00			
			3.61	3.61	1204.127	T.P.# 9 60 DNAIL
			2.22			
12.015						
10.75	10.75	1214.877				
9.485			9.765	hdj	1206.685	
			8.205	8.207	1206.670	PANEL# W040 1X2 HUB FLUSH W/GROUND
			6.65			
11.29						
9.87	9.873	1216.543				
8.46			4.55			
			3.15	3.15	1213.393	T.P.#10 60 D NAIL
			1.75			
9.685						
8.13	8.132	1221.525				
6.58			4.415			
			2.85	2.848	1218.677	T.P.#11 60 D NAIL
			1.28			

	+	HI		-	ELEV.	REMARKS
7.04					1218.677	
5.405	5.405	1224.082				
3.77						
			4.14			
			2.45	2.45	1221.632	T.P.#12 60 DNAIL
			0.76			
9.58						
8.05	8.053	1229.685				
6.53						
			3.17			
			1.735	1.738	1227.947	T.P.#13 " " "
			0.31			
8.22						
6.68	6.68	1234.627				
5.14						
			5.705			
			4.405	4.407	1230.220	T.P.#14 " " "
			3.11			
9.68						
8.38	8.382	1238.602				
7.085						
			5.37			
			3.71	3.71	1234.892	T.P.#15 " " "
			2.05			

	+	HI		-	ELEV	REMARKS
10.18					1234.892	
8.55	8.55	1243.442				
6.92			5.465			
			3.78	3.778	1239.664	T.P.# 16
			2.09			60 P NAIL
7.67						
6.06	6.06	1245.724				
4.45			3.945			
			2.61	2.61	1243.114	T.P.# 17
			1.275			" " "
7.16						
5.745	5.745	1248.859				
4.33			2.83			
			1.52	1.517	1247.342	T.P.# 18
			0.20			" " "
8.87						
7.32	7.32	1254.662				
5.77			6.60			
			5.26	5.263	1249.399	T.P.# 19
			3.93			" " "

	+	HI		-	ELEV	
9.11					1249.399	
7.74	7737	1257.136				
6.36			2.825			
			1.55	1.55	1255.586	T.P.# 20 60 D NAIL
			0.275			
7.76						
6.34	6.337	1261.923				
4.91			4.80			
			3.58	3.58	1258.343	T.P.# 21 " " "
			2.36			
7.09						
6.105	6.103	1264.446				
5.115			2.745			
			1.765	1.768	1262.678	T.P.# 22 " " "
			0.795			
10.80						
9.45	9.45	1272.128				
8.10			9.65			
			8.58	8.583	1263.545	T.P. 23 " " "
			7.52			

	+	HI	-	ELEV	REMARKS
				1263.545	
771					
6.42	6.418	1269.963			
5.125					
			6.09	Adj 1264.960	
			5.025	5.028 1264.935	PANEL # W/O 39 P.K. NAIL @ E STRIPE OF S. BOUND
			3.97		ON PALO VERDE
292					
1.47	1.47	1266.405			
0.02					
			11.01		
			9.48	9.483 1256.722	T.P.# 24 WHITE PAINT DOT ON R. BOUND CURVE
			7.96		WEST SIDE PALOVERE
4.09					
2.72	2.717	1259.639			
1.34					
			9.12		
			7.60	7.597 1252.042	T.P.# 25 " " " " " "
			6.07		
4.57					
3.11	3.11	1255.152			
1.65					
			9.94		
			8.43	8.43 1246.722	T.P.# 26 " " " " " "
			6.92		

	+	HI		-	ELEV	REMARKS
3.84					1246.722	
2.47	2.47	1249.192				
1.10						
			10.36			
			8.78	8.78	1240.412	T.P.# 27 WHITE PAINT DOT ON RIBBON CURB WEST OF PALO VERDE
			7.20			
5.12						
3.51	3.51	1243.922				
1.90						
			8.15			
			6.65	6.647	1237.275	T.P.# 28 " " " " " " " "
			5.14			
4.06						
2.595	2.595	1239.870				
1.13						
			10.35			
			8.865	8.868	1231.002	T.P.# 29 " " " " " " " "
			7.39			
3.26						
1.81	1.812	1232.814				
0.365						
			8.23			
			6.73	6.73	1226.084	T.P.# 30 " " " " " " " "
			5.23			

	+	HI	-	ELEV	REMARKS
				1226.084	
5.215					
3.805	3.805	1229.889			
2.395					
			9.42		
			7.93	7.933	1221.966
			6.45		T.P.# 31 WHITE PAINT DOT ON RIBBON CURB WEST OF E ON P.V.
6.01					
4.65	4.653	1226.609			
3.30					
			8.275		
			6.815	6.815	1219.794
			5.355		T.P.# 32 " " " " " " " "
4.01					
2.545	2.543	1222.337			
1.075					
			10.915		
			9.42	9.425	1212.912
			7.935		
4.83					
3.35	3.35	1216.262			
1.87					
			9.33		
			7.80	7.797	1208.465
			6.26		T.P.# 33 " " " " " " " "

	+	HI		-	ELEV	REMARKS
		1176.271	5.27			
			4.083	4.084	1172.187	T.P.#1 60 D NAIL
			2.90			
9.855						
8.57	8.568	1180.755				
7.28			6.94			
			5.643	5.643	1175.112	T.P.#2 " " "
			4.345			
9.92						
8.405	8.405	1183.517				
6.89			5.27			
			4.07	4.07	1179.447	T.P.#3 " " "
			2.87			
8.295						
6.90	6.902	1186.349				
5.51			5.18			
			3.785	3.787	1182.562	T.P.#4 " " "
			2.395			
8.23						
6.98	6.98	1189.542				
5.73						

	+	HI		-	ELEV	REMARKS
		1189.542	5.67			
			4.345	4.347	1185.195	T.P.#5 60D NAIL
			3.025			
895						
7.58	7.582	1192.777				
6.215						
			4.76			
			3.365	3.368	1189.409	T.P.#6 60D NAIL
			1.98			
891						
7.51	7.51	1196.919				
6.11						
			5.54			
			4.235	4.235	1192.684	T.P.#7 " "
			2.93			
7.38						
5.84	5.84	1198.524				
4.30						
			3.97			
			2.64	2.637	1195.887	T.P.#8 " "
			1.30			
808						
6.81	6.81	1202.697				
5.54						

	+	HI		-	ELEV	REMARKS
		1202.697	10.17			
			8.86	886	1193.837	T.P.#9 60 D NAIL
			7.55			
9.64						
8.25	8.253	1202.09				
6.87						
			3.87			
			2.50	250	1199.59	T.P.# 10 " "
			1.13			
7.95						
6.485	6.487	1206.077				
5.025						
			4.07			
			2.74	2.74	1203.337	T.P.# 11. " "
			1.41			
8.59						
7.01	7.01	1210.347				
5.43						
			7.515			
			6.295	6.293	1204.054	T.P.# 12 " "
			5.07			
5.185						
3.94	3.942	1207.116				
2.70						

	+	HI		-	ELEV	REMARKS	28
		1207.996	9.785				
			8.44	8.442	1199.554	T.P.# 13 60 D NAIL	
			7.10				
6.28							
5.125	5.125	1201.677					
3.97							
			10.595				
			9.35	9.352	1195.327	T.P.# 14 " " "	
			8.11				
5.26							
3.965	3.968	1199.295					
2.68							
			3.24				
			2.03	2.033	1197.262	T.P.# 15 " " "	
			0.53				
7.57							
6.30	6.297	1203.559					
5.02							
			4.41	Adj	1200.074		
			3.53	3.53	1200.027	PANEL# W0 41 1X2 Hub FLUSH	
			2.65				
4.21							
3.39	3.388	1203.417					
2.565							

	+	HI		-	ELEV	REMARKS
		1203.417	7.665			
			6.47	6.468	1196.949	T.P.#16 60 D NAIL
			5.27			
4.23						
2.915	2.912	1199.861				
1.59						
			5.17			
			3.93	3.927	1195.934	T.P.#17 " " "
			2.68			
9.485						
8.51	8.508	1204.442				
7.53						
			6.085			
			4.88	4.883	1199.559	T.P.#18 " " "
			3.685			
9.57						
8.45	8.45	1208.009				
7.33						
			5.435			
			3.955	3.958	1204.051	T.P. 19 " " "
			2.485			
8.33						
7.18	7.182	1211.233				
6.035						

	+	HI		-	ELEV	REMARKS
		1211.233	5.79			
			4.50	4.50	1206.733	T.P. # 20 60 D NAIL
			3.21			
8.10						
6.53	6.53	1213.263				
4.96						
			4.815			
			3.45	3.453	1209.81	T.P. # 21 " " "
			2.095			
8.475						
7.275	7.275	1217.085				
6.075						
			5.235			
			3.96	3.962	1213.123	T.P. # 22 " " "
			2.69			
6.26						
5.13	5.133	1218.256				
4.01						
			5.97			
			4.61	4.613	1213.643	T.P. 23 " " "
			3.26			
6.95						
5.665	5.667	1219.31				
4.385						

	+	HI		-	ELEV	REMARKS
		1219.31	4.365			
			3.135	3.137	1216.173	T.P.#24 60 D. NAIL
			1.91			
7.66						
6.435	6.438	1222.611				
5.22						
			5.83			
			4.52	4.522	1218.089	T.P.#25 " " "
			3.215			
3.695						
2.175	2.175	1220.264				
0.655						
			14.67			
			13.30	13.297	1206.967	T.P.#26 " " "
			11.92			
12.77						
11.27	11.273	1218.24				
9.78						
			5.94	Adj	1214.021	
			4.28	4.28	1213.96	PANEL # W018 GLO B.C. SEC. COR. OF
			2.62			100 ABOVE GROUND
6.19						
4.52	4.523	1218.483				
2.86						

	+	HI		-	ELEV	REMARKS
		1218.483				
			13.02			
			11.52	11.52	1206.903	T.P.# 27 60 D NAIL
			10.02			
14.48						
13.08	13.08	1220.043				
11.68						
			3.46			
			1.955	1.958	1218.085	T.P.# 28 " " "
			0.46			
5.62						
4.22	4.22	1222.305				
2.82						
			6.895	Adj	1216.617	
			5.755	5.753	1210.552	T.P.# 29 SET 1/2" RE bar
			4.61			
6.13						
5.14	5.14	1221.692				
4.15						
			9.68			
			8.24	8.243	1213.449	T.P.# 30 60 D NAIL
			6.81			
5.415						
4.205	4.207	1217.656				
3.00						

		+	HI	-	ELEV	REMARKS
			1217.656			
			4.85			
			3.34	3.34	1214.316	T.P.#31 60 D NAIL
			1.83			
9.40						
7.655	7.662		1221.978			
5.93						
			4.575			
			3.155	3.168	1218.81	T.P.#32 " " "
			1.765			
8.29						
6.96	6.963		1225.773			
5.64						
			8.50			
			6.95	6.95	1218.823	T.P.#33 " " "
			5.40			
10.295						
9.33	9.33		1228.153			
8.365						
			4.24			
			2.775	2.775	1225.378	T.P.#34 " " "
			1.31			
10.19						
8.90	8.898		1234.276			
7.605						

	+	HI	-	ELEV	REMARKS	34
		1234.276				
			6.425			
			4.87	4.87	1229.406	T.P.#35 60 D NAIL
			3.315			
9.81						
8.58	8.579	1237.988				
7.347						
			2.895	Adj	1236.436	
			1.625	1.623	1236.362	PANEL# W019 GLO BRASS CAP SEC. CORNER
			0.35			T2N R4W .90 ABOVE GROUND
6.19						
4.985	4.987	1241.349				
3.785						
			5.485			
			4.31	4.31	1237.039	T.P.#36 60 D NAIL
			3.135			
8.685						
7.25	7.252	1244.291				
5.82						
			4.095			
			2.71	2.71	1241.581	T.P.#37 " " "
			1.325			
7.865						
6.61	6.607	1248.188				
5.345						

	+	HI		-	ELEV	REMARKS
		1248.188	5.81			
			4.56	4.562	1243.626	T.P.# 38 60 D NAIL
			3.315			
9.785						
8.35	8.348	1251.974				
6.91			4.96			
			3.565	3.565	1248.409	T.P.# 39 " " "
			2.17			
10.16						
8.685	8.682	1257.091				
7.20			6.505			
			5.045	5.048	1252.013	T.P.# 40 " " "
			3.595			
9.68						
8.24	8.242	1260.285				
6.805			5.91			
			4.59	4.59	1255.695	T.P.# 41 " " "
			3.27			
10.48						
8.96	8.957	1264.652				
7.43						

	+	HI		-	ELEV	REMARKS
		1264.652	605			
			4.42	4.42	1260.232	T.P.# 42 60 D NAIL
			2.79			
11.69						
10.13	10.13	1270.362				
8.57			4.98			
			3.48	3.477	1266.885	T.P. 43 " " "
			1.97			
8.665						
7.19	7.192	1274.077				
5.72			3.645			
			2.49	2.492	1271.585	T.P.# 44 " " "
			1.34			
6.09						
5.445	5.448	1277.033				
4.81			3.75	Adj	1273.932	
			3.19	3.189	1273.844	PANEL # W020 GLO B.C. SEC. COR OF 57/58 T2N R4W .90 ABOVE GROUND 518/517
			2.627			
8.91						
7.37	7.373	1281.217				
5.84						

	+	HI		-	ELEV	REMARKS
		1281.217	2.715			
			1.51	1.507	1279.71	T.P.#45 Rock
			0.295			
10.20						
8.80	8.797	1288.507				
7.39			6.28			
			4.94	4.94	1283.567	T.P.#46 Rock
			3.60			
8.93						
7.485	7.485	1291.052				
6.04			3.85			
			2.51	2.51	1288.542	T.P.#47 60 D NAIL
			1.17			
10.51						
9.09	9.093	1297.635				
7.68			4.265			
			2.96	2.962	1294.673	T.P.#48 " " "
			1.66			
9.58						
8.23	8.227	1302.90				
6.87						

	+	HI		-	ELEV	REMARKS	38
		1302.90	3.785	Adj	1302.366		
			2.625	2.628	1300.272	T.P.# 49 GLO B.C. 1/4 COR. OF SEC. 17N/35	
			1.475			.45 ABOVE GROUND	
8.25							
6.82	6.817	1307.089					
5.38							
			4.43				
			3.05	3.053	1304.036	T.P.# 50 60 D NAIL	
			1.68				
5.38							
4.20	4.20	1308.236					
3.02							
			4.685				
			3.53	3.533	1304.703	T.P.# 51 ROCK	
			2.385				
9.95							
8.38	8.377	1313.08					
6.80							
			4.97				
			3.365	3.362	1309.18	T.P.# 52 60 D NAIL	
			1.75				
11.845							
10.36	10.362	1320.08					
8.88							

	+	HI		-	ELEV	REMARKS
		132008	4.14			
			2.82	2.817	1317.263	T.P.#53 60 D NAIL
			1.49			
9.68						
8.505	8.505	1325.768				
7.33						
			5.24	Adj	1321.909	
			3.96	3.96	1321.808	PANEL# W021 SEC COR. OF ⁸¹⁹ 1716 4 T2NR4W
			2.68			MARICOPA COUNTY HIGHWAY DEPT. B.C. IN H. H.
6.485						.53 BELOW LID
5.14	5.14	1326.948				
3.795						
			9.04			
			7.57	7.57	1319.378	T.P.#54 WHITE PAINT DOT ON RIBBON CURB WEST OF
			6.10			Q ON PALO VERDE
5.00						
3.545	3.542	1322.92				
2.08						
			8.74			
			6.85	6.85	1316.07	T.P.#55 " " " " " " " "
			4.96			
6.02						
4.355	4.357	1320.427				
2.695						

	+	HI	-	ELEV	REMARKS
		1320427			
			8.97		
			7.55	7.553 1312.874	T.P.#56 WHITE PAINT DOT ON RIBBON CURB WEST OF E
			6.14		ON P.V.
3.64					
1.92	1.92	1314.794			
0.20					
			10.53		
			9.06	9.063 1305.731	T.P. 57 " " " " " " "
			7.60		
5.04					
3.425	3.425	1309.156			
1.81					
			8.42		
			6.925	6.922 1302.234	T.P.# 58 " " " " " " "
			5.42		
5.035					
3.29	3.29	1305.524			
1.545					
			8.94		
			7.51	7.51 1298.014	T.P.#59 " " " " " " "
			6.08		
4.45					
2.835	2.835	1300.849			
1.22					

	+	HI	-	ELEV	REMARKS
		1300.849			
			10.97		
			9.515	1291.334	T.P.#60 WHITE PAINT DOT ON RIBBON CURB WEST OF & ON P.V.
			8.06		
4.16					
2.51	2.508	1293.842			
0.885					
			8.19		
			6.765	1287.08	T.P.#61 " " " " " " "
			5.33		
4.65					
3.10	3.097	1290.177			
1.54					
			10.32		
			8.87	1281.307	T.P.#62 " " " " " " "
			7.42		
5.59					
3.945	3.948	1285.255			
2.31					
			8.85		
			7.38	1277.878	T.P.#63 " " " " " " "
			5.90		
4.03					
2.41	2.413	1280.291			
0.80					

	+	HI	-	ELEV	REMARKS
		1280.291			
			10.13		
			8.68	1271.611	T.P.#64 WHITE PAINT DOT ON RIBBON CURB WEST OF
			7.23		♀ ON PV
5.31					
3.66	3.66	1275.271			
2.01					
			8.15		
			6.645	6.642 1268.629	T.P.#65 " " " " " "
			5.13		
5.07					
3.51	3.513	1272.142			
1.96					
			8.49	Adj 1264.960	
			7.30	7.30 1264.842	PANEL # W039 P.K. NAIL SEE PAGE 22 THIS
			6.11		Back

	+	HI	-	ELEV	REMARKS	
6.465			Adj 1321.909	1321.808	PANEL W021 SEC COR OF 819 17176 PTZN R4W	
5.38	5.383	1327.191			M.C.H.D B.C. IN H.H. .53 BLOWLID	
4.305						
			6.04			
			4.91	4.912	1322.279	T.P.#1 60 D NAIL
			3.785			
7.745						
6.525	6.525	1328.804				
5.365						
			4.975			
			3.66	3.66	1325.144	T.P.#2
			2.345			
8.49						
7.23	7.23	1332.374				
5.97						
			3.96			
			2.695	2.695	1329.679	T.P.#3
			1.43			
10.075						
8.825	8.825	1338.504				
7.575						
			3.15			
			1.86	1.857	1336.647	T.P.#4
			0.56			

	+	HI		-	ELEV	REMARK	44
9.115					1336.647		
7.81	7.808	1344.455					
6.50			5.555				
			4.21	4.208	1340.247	T.P.#5	60 D NAIL
			2.86				
7.85							
6.51	6.512	1346.759					
5.175							
			5.78				
			4.38	4.38	1342.379	T.P.#6	
			2.98				
7.87							
6.43	6.433	1348.812					
5.00							
			5.68				
			4.23	4.233	1344.579	T.P.#7	
			2.79				
7.55							
6.37	6.367	1350.946					
5.18							
			5.74				
			4.56	4.563	1346.383	T.P.#8	
			3.39				

	+	HI		-	ELEV	REMARKS
8.19					1346.383	
6.81	6.807	1353.19				
5.42			4.025			
			2.56	2.562	1350.628	T.P.#9 60 D NAIL
			1.10			
9.95						
8.50	8.497	1359.125				
7.04						
			4.50	Adj	1356.570	
			2.625	2.628	1356.497	PANEL # W043 M.C.H.D. B.C. IN H.H.
			0.76			.69 BELOW LID N.E. COR. OF SEC 8
						T2N R4W
3.575						
2.91	2.91	1359.407				
2.245						
			9.05			
			7.93	7.93	1351.477	T.P.#10 60 D NAIL
			6.81			
4.62						
3.68	3.68	1355.157				
2.74						
			9.22			
			8.07	8.073	1347.084	T.P.#11 " " "
			6.93			

	+	HI		-	ELEV	REMARKS
5.49					1347.084	
3.98	3.98	1351.064				
2.47						
			6.30			
			4.71	4.713	1346.351	T.P.# 12 60 D NAIL
			3.13			
5.605						
4.555	4.558	1350.909				
3.515						
			6.55			
			5.45	5.453	1345.456	T.P.# 13 60 D NAIL
			4.36			
5.075						
3.745	3.745	1349.201				
2.415						
			5.785			
			4.715	4.717	1344.484	T.P.# 14 " " "
			3.65			
3.82						
2.71	2.71	1347.114				
1.60						
			7.87	Adj	1340.620	
			6.63	6.63	1340.564	PANEL # W044 1X2 HUB FLUSH
			5.39			

	+	HI	-	ELEV	REMARKS
5.22				1340.564	
4.32	4.32	1344.884			
3.42					
			8.45		
			7.545	1337.339	T.P.# 15 60 D NAIL
			6.64		
8.00					
6.79	6.79	1344.129			
5.58					
			6.335		
			5.125	1339.004	T.P.# 16 " " "
			3.915		
6.28					
5.13	5.13	1344.134			
3.98					
			9.395		
			8.22	1335.911	T.P.# 17 " " "
			7.055		
11.615					
10.565	10.562	1346.473			
9.505					
			4.85		
			3.76	1342.713	T.P.# 18 " " "
			2.67		

	+	HI	-	ELEV	REMARKS
3.62				1342.713	
2.39	2.39	1345.103			
1.16					
			3.45		
			2.17	1342.936	T.P.# 19
			0.88		60 D NAIL
5.84					
4.895	4.898	1347.834			
3.96					
			5.15		
			4.10	1343.734	T.P.# 20
			3.05		" " "
6.08					
5.08	5.08	1348.814			
4.08					
			4.605		
			3.585	1345.231	T.P.# 21
			2.56		" " "
7.60					
6.48	6.48	1351.711			
5.36					
			4.83		
			3.685	1348.026	T.P.# 22
			2.54		" " "

	+	HI		-	ELEV	REMARKS
6.895					1348.026	
5.71	5.707	1353.733				
4.515			5.43			
			4.155	4.155	1349.578	T.P. 23 60 D NAIL
			2.88			
5.31						
4.59	4.59	1354.168				
3.87			4.325			
			3.31	3.313	1350.855	T.P. # 24 CONC. PAD ON POWER TOWER
			2.305			
4.605						
3.015	3.015	1353.87				
1.425			8.845			
			7.595	7.597	1346.275	T.P. # 25 60 D NAIL
			6.35			
10.87						
9.725	9.727	1356.00				
8.585			10.583			
			9.26	9.261	1346.739	T.P. # 26 " " "
			7.94			

	+	HI		-	ELEV	REMARKS	50
8.085					1346.739		
6.58	6.582	1353.321					
5.08							
			10.44				
			8.81	8.812	1344.509	T.P.# 27 1X2 HUB	
			7.185				
3.78							
2.64	2.64	1347.149					
1.50							
			9.21				
			8.08	8.079	1339.07	T.P.# 28 60 P NAIL	
			6.948				
2.95							
1.52	1.523	1340.593					
0.10							
			9.35				
			7.925	7.925	1332.668	T.P.# 29 " " "	
			6.50				
2.95							
1.67	1.672	1334.34					
0.395							
			8.885				
			7.65	7.652	1326.683	T.P.# 30 " " "	
			6.42				

	+	HI		-	ELEV	REMARKS	51
2.63					1326.688		
1.55	1.55	1328.238					
0.47							
			8.33				
			7.205	7.204	1321.034	T.P. # 31	60 D NAIL
			6.078				
5.42							
4.025	4.025	1325.059					
2.63							
			9.24				
			7.96	7.958	1317.101	T.P. # 32	" " "
			6.675				
4.39							
2.725	2.725	1319.826					
1.06							
			13.242				
			11.645	11.642	1308.134	T.P. # 33	
			10.04				
9.87							
8.73	8.73	1316.914					
7.59							
			11.635				
			10.28	10.279	1306.635	T.P. # 34	
			8.922				

	+	HI		-	ELEV	REMARK
14.00					1306.635	
11.62	11.62	1318.255				
9.24			11.37			
			9.875	9.875	1308.33	T.P. #35
			8.38			
11.12						
9.93	9.932	1318.312				
8.746						
			4.01	Adj	1315.181	
			3.123	3.124	1315.188	PANEL # W025 1/2 REBAR
			2.239			
4.05						
3.165	3.165	1318.353				
2.28						
			11.155			
			9.972	9.972	1308.381	T.P. 36 60 D NAIL
			8.79			
11.36						
9.865	9.865	1318.246				
8.37						
			13.97			
			11.595	11.598	1306.648	T.P. #37 "
			9.23			" "

REMARKS

	+	HI	-	ELEV		REMARKS
1.179				1306.648		
9.75	9.751	1316.399				
8.325						
			9.37			
			8.205	8.204	1308.195	T.P. # 38 60" D NAIL
			7.038			
12.65						
11.106	11.105	1319.30				
9.56						
			11.52			
			9.92	9.923	1309.377	T.P. # 39 " " "
			8.33			
3.64						
2.14	2.14	1311.517				
0.64						
			11.54			
			10.06	10.06	1301.457	T.P. # 40 " " "
			8.58			
4.00						
2.795	2.794	1301.251				
1.588						
			9.71			
			8.175	8.177	1296.074	T.P. # 41
			6.647			

	+	HI		-	ELEV	REMARKS
6.80					1296.074	
5.44	5.44	1301.514				
4.08			4.715			
			13.07	13.072	1288.442	T.P.# 42 60 D NAIL
			11.43			
5.415						
4.835	4.835	1293.277				
3.255						
			10.31			
			8.75	8.75	1284.527	T.P.# 43 " " "
			7.19			
7.065						
5.628	5.624	1290.151				
4.18						
			8.95			
			7.443	7.444	1282.707	T.P. 44 " " "
			5.938			
4.705						
2.67	2.673	1285.38				
0.645						
			9.85			
			8.388	8.389	1276.991	T.P. 45 " " "
			6.928			

	+	HI	-	ELEV	REMARKS
5.19				1276.991	
3.88	3.88	1280.871			
2.57					
			11.211		
			9.67	1271.201	T.P. # 46 60 D NAIL
			8.13		
4.635					
3.27	3.27	1274.471			
1.905					
			10.39	Adj 1265.913	
			8.52	1265.954	PANEL # W047 1X2 Hub FLUSH
			6.64		
4.83					
3.17	3.172	1269.126			
1.515					
			10.54		
			9.045	1260.081	T.P. # 47 60 D NAIL
			7.55		
4.405					
3.305	3.304	1263.385			
2.202					
			6.52		
			5.098	5.099 1258.286	T.P. # 48 " " "
			3.68		

		+	HI			-	ELEV	REMARKS
6.73							1258.35	
5.143	5.144		1263.43					
3.56								
				9.802				
				8.29	8.291		1255.13	T.P.#49 60 D NAIL
				6.78				
8.10								
6.94	6.94		1262.079					
5.78								
				7.50	Adj		1255.90	
				6.12	6.118		1255.961	T.P.#50 1 1/2 Hub @ "T" INTERSECTION OF DIRT RD.
				4.735				
5.56								
3.93	3.93		1259.891					
2.30								
				8.51	Adj		1252.866	
				6.97	6.97		1252.921	T.P.# 51 60 D NAIL
				5.43				
5.20								
3.52	3.52		1256.441					
1.84								
				8.73	Adj		1249.141	
				7.24	7.242		1249.199	T.P.# 52 " " "
				5.755				

	+	HI	-	ELEV	REMARKS
5.02				1249.199	
3.79	3.79	1252.989			
2.56					
			9.37		
			7.875	7.872 1245.117	T.P.# 53 60 D NAIL
			6.37		
5.71					
1.155	4.157	1249.274			
2.605					
			8.485		
			6.93	6.932 1242.342	T.P. 54. 60 D NAIL
			5.38		
5.925					
4.05	4.052	1246.394			
2.18					
			9.61		
			8.09	8.088 1238.306	T.P. 55 " " "
			6.565		
5.58					
3.58	3.58	1241.886			
1.58					
			7.82		
			6.28	6.282 1235.604	T.P.# 56 " " "
			4.745		

	+	HI		-	ELEV	REMARKS
4.985					1235.604	
3.60	3.602	1239206				
2.22						
			8.84			
			7.42	7.422	1231.784	T.P.#57 60 D NAIL
			6.005			
4.99						
3.46	3.462	1235246				
1.935						
			7.97			
			6.51	6.507	1228.739	T.P.#58 60 D NAIL
			5.04			
5.98						
4.43	4.433	1233172				
2.89						
			9.605			
			8.045	8.043	1225.129	T.P.#59 " " "
			6.48			
4.095						
2.77	2.768	1227897				
1.44						
			7.80			
			6.285	6.285	1221.612	T.P.#60 " " "
			4.77			

	+	HI		-	ELEV	REMARKS	59
5.43 1.062 2.698	4.063	1225.675			1221.612		
			8.25 7.185 6.12	7.185	1218.49	T.P. #61 60 D NAIL	
5.10 4.409 3.72	4.41	1222.90					
			6.95 6.20 5.44	Adj 6.197	1216.617 1216.703	✓ IN T.P. #29 1/2 REBAR SEE THIS BOOK PAGE 32 Adj 1216-617	
2.595 2.57 1.53 1.505 2.43 0.46	1528 1.502	1257.489 1257.463		Adj	1255.904 1255.961	T.P. #50 1X2 Hub @ "T" INTER. OF DIST. Rd's THIS BOOK PAGE 56 ELEV. 1255.961 Adj 1255.909	
			6.24 6.21 4.75 ⁴⁷⁸	4.779 4.75	1252.71 1252.713	T.P. # 1 60 D NAIL	
5.47 4.20 5.24 4.02 7.80 3.09	428 4.02	1256.99 1256.733	3.29 3.318 10.95 10.60 9.21 9.48 7.77801	9.48 7.613	1247.51 1247.52	T.P. # 2 " " "	

	+	HI		-	ELEV	REMARKS	60
2.54					1247.52		
1.27	1.273	1248.793					
0.01							
			14.72				
			13.345	13.343	1235.45	T.P.# 3	60 D NAIL
			11.965				
1.50							
0.85	0.85	1236.30					
0.20							
			9.54				
			7.97	7.97	1228.33	T.P.# 4	" " "
			6.40				
2.51							
1.43	1.43	1229.76					
0.35							
			14.585				
			13.475	13.473	1216.287	T.P.# 5	" " "
			12.36				
4.12							
2.785	2.785	1219.072					
1.45							
			5.74				
			4.26	4.263	1214.809	T.P.# 6	" " "
			2.79				

	+	HI		-	ELEV	REMARKS
4.97					1214.809	
3.62	3.622	1218.431				
2.275						
			11.235			
			9.76	9.758	1208.673	T.P.#7 60 D NAIL
			8.28			
2.76						
1.44	1.443	1210.116				
0.13						
			9.86			
			8.365	8.363	1201.753	T.P.#8 " " "
			6.865			
2.99						
1.70	1.702	1203.455				
0.415						
			9.82			
			8.34	8.338	1195.117	T.P.#9 " " "
			6.855			
4.00						
2.73	2.73	1197.817				
1.46						
			9.91			T.P.#10 " " "
			8.39	8.393	1189.454	
			6.88			

	+	HI	-	ELEV	REMARKS	62
4.32				1189.454		
3.16	3.16	1192.614				
2.00						
			8.325			
			7.085	7.085	1185.529	T.P.# 11 60 D NAIL
			5.845			
3.65						
2.35	2.348	1187.877				
1.043						
			5.54			
			4.08	4.08	1183.797	T.P.# 12 60 D NAIL
			2.62			
9.11						
7.88	7.88	1191.677				
6.65						
			4.11			
			2.65	2.65	1189.027	T.P.# 13 60 D NAIL
			1.19			
7.945						
6.565	6.565	1195.592				
5.185						
			3.57			
			2.34	2.337	1193.255	T.P.# 14 60 D NAIL
			1.10			

	+	HI		-	ELEV	REMARKS
8.455					1193.255	
7.535	7.535	1200.79				
6.615			3.60			
			2.78	2.78	1198.01	T.P. 15 60 D NAIL
			1.96			
6.80						
6.165	6.167	1204.177				
5.535			3.65	Adj	1200.902	
			3.20	3.203	1200.974	PANEL # W024 G.L.O. BRASS CAP ^{S35/S36} _{S2/S1} 4
			2.758			T8N RSW 1.10 ABOVE GROUND
3.67						
3.22	3.223	1204.197				
2.78			6.83			
			6.19	6.193	1198.004	T.P. 15
			5.56			
3.384						
2.515	2.515	1200.519				
1.645			8.15			
			7.275	7.275	1193.244	T.P. 17
			6.40			

	+	HI		-	ELEV	REMARKS
3.718					1193.244	
2.50	2.501	1195.745				
1.285						
			8.11			
			6.74	6.74	1189.005	T.P.#18
			5.37			
4.405						
2.90	2.898	1191.903				
1.39						
			9.335			
			8.135	8.135	1183.768	T.P.#19
			6.935			
5.365						
3.973	3.973	1187.741				
2.582						
			3.62			
			2.24	2.242	1185.499	T.P.#20
			0.865			
8.35						
7.085	7.085	1192.584				
5.82						
			4.30			
			3.155	3.157	1189.427	T.P.#21
			2.015			

	+	HI		-	ELEV	REMARKS
9.685					1189.427	
8.265	8.265	1197.692				
6.845						
			3.96			
			2.59	2.59	1195.102	T.P.# 22
			1.22			
9.66						
8.255	8.255	1203.357				
6.85						
			2.98			
			1.61	1.61	1201.747	T.P.# 28
			0.24			
10.07						
8.48	8.477	1202.224				
6.88						
			2.765			
			1.54	1.538	1208.686	T.P.# 29
			0.31			
11.73						
11.23						
10.19	10.193	1218.879				
9.745	9.745	1218.131				
8.66						
8.26			5.36			
			4.925			
			4.05	4.052	1214.827	
			3.575	3.575	1214.856	T.P.# 30
			2.225			
			2.745			

	+	HI	-	ELEV	REMARKS
5.802 5.75 4.29 4.23 2.78 2.71	4.291 4.23	1219.118 1219.086		1214.856 1214.827	
14.665 14.57 13.585 13.45 12.44 12.34	13.553 13.453	1229.861 1229.772	4.11 4.045 2.81 2.745 1.51 1.45	2.81 2.747	1216.308 1216.339 T.P.# 31
9.51 9.47 8.05 7.925 6.39 6.30	8.05 7.925	1236.405 1236.342	2.585 2.465 1.505 1.375 0.428 0.285	1.506 1.375	1228.355 1228.417 T.P.# 32
15.00 14.93 13.585 13.405 12.17 12.045	13.585 13.487	1249.07 1249.049	1.71 1.46 0.92 0.78 0.13 0.10	0.92 0.78	1235.485 1235.561 T.P.# 33
			2.73 2.55 1.33 ^{1.51} 1.33 0.110.29	1.33 ^{1.51} 1.33	1247.56 1247.719 T.P.# 34

	+	HI	-	ELEV	REMARK
11.29 11.85 9.75 10.42 8.85 8.30	9.795 10.418	1257.355 1258.137		1247.779 1247.56	
			5.77 6.345 4.595 5.19 4.045 ^{3.42}	4.595 5.193 1252.76 1252.944	T.P. # 35
6.49 6.20 5.02 4.73 3.56 3.27	5.023 4.733	1257.783 1257.677		1256.005 1256.204	T.P. # 36 IK2Hub
			2.84 2.55 1.778 1.47 0.713 0.40		
5.27 5.55 3.66 3.455 2.05 2.37	3.66 3.958	1259.665 1260.107			
			8.285 6.595 6.70 7.005 5.24 5.41	6.702 7.003 1252.866 1252.903 1253.159	VIN T.P. # 51 1252.921 Adj 1252.866

THIS BOOK PAGE 56

	+	HI		-	EL	REMARKS
7.03					1365.492	
5.81	5.81	1371.302				
4.59						
			7.345			
			6.08	6.078	1365.224	T.P.#5 T/C
			4.81			
7.755						
6.34	6.338	1371.562				
4.92						
			7.01			
			5.32	5.32	1366.242	T.P.#6 FD BC IN HOWL
			3.63			STAMPED 1367.94 M.C.H.D 1988
9.38						
7.905	7.905	1364.147				
6.43						
			2.99			
			1.51	1.51	1372.637	T.P.#7 T/C
			0.03			
11.65						
10.07	10.07	1382.707				
8.49						
			4.315			
			2.84	2.837	1377.37	T.P.#8 T/C
			1.355			

	+	HI		-	EL	REMARKS
8.475					1379.87	
7.05	7.052	1386.922				
5.61						
			3.40			
			1.97	1.967	1384.956	T/P # 9 T/C
			0.53			
10.67						
9.32	9.32	1394.27				
7.97						
			2.71			
			1.44	1.437	1392.838	T.P.# 10 T/C
			0.16			
10.20						
8.66	8.663	1401.50				
7.13						
			4.31			
			2.81	2.807	1398.694	T.P.# 11 T/C
			1.30			
6.462						
6.20	6.198	1404.892				
5.932						
			7.505			
			7.17	7.17	1397.722	T.P.# 12 FD. B.C. IN HOWL STAMPED
			6.835			1399.39 MCHD 1988

	+	HI		-	ELEV		REMARKS
11.62					1397.722		
10.37	10.37	1408.092					
9.12							
			4.58				
			3.33	3.33	1404.762	T.P.# 13 T/C	
			2.08				
7.42							
6.545	6.547	1411.309					
5.675							
					1407.554		
			4.665	Adj	1407.576		
			3.80	3.798	1407.511	PANEL# W022	NAIL
			2.93				
4.57							
3.71	3.707	1411.218					
2.84							
			10.47				
			9.12	9.12	1402.098	T.P.# 14 T/C	
			7.77				
4.61							
3.165	3.165	1405.263					
1.72							
			8.70				
			7.24	7.243	1398.02	T.P.# 15 T/C	
			5.79				

	+	HI		-	EL	REMARKS
4.24					1398.02	
2.61	2.61	1400.63				
0.98			11.25			
			9.66	966	1390.97	T.P.# 16 T/C
			8.07			
2.98						
1.60	1.597	1392.567				
0.21			10.70			
			9.33	9.327	1383.24	T.P.# 17 T/C
			7.95			
4.24						
2.70	2.70	1385.94				
1.16			8.77			
			7.26	7.26	1378.53	T.P.# 18 T/C
			5.75			
3.66						
2.31	2.313	1380.993				
0.97			11.11			
			9.75	9.75	1371.243	T.P.# 19 T/C
			8.39			

	+	HI		-	EL	REMARKS
3.825					1371.243	
2.41	2.412	1373.655				
1.00			7.97			
			6.56	6.56	1367.095	T.P.#20 T/C
			5.15			
5.70						
3.94	3.943	1371.038				
2.19			7.08			
			5.32	5.323	1365.715	T.P.#21 T/C
			3.57			
7.25						
5.66	5.663	1371.370				
4.08			13.27			
			11.97	11.97	1359.408	T.P. 22 60 D NAIL
			10.67			
5.59						
4.23	4.23	1363.638				
2.87			10.07			
			8.85	8.85	1354.788	T.P.#23 " " "
			7.63			

	+	HI		-	EL	REMARKS
3.03					1354.788	
1.79	1.787	1356.575				
0.54			9.91			
			8.59	8.59	1347.985	T.P.# 24 60 D NAIL
			7.27			
3.30						
2.355	2.358	1350.343				
1.42					1340.600	
			11.9	Adj	1340.550	
			9.74	9.74	1340.603	PANEL # W044
			8.29			
<hr/>						
4.221				Adj	1247.141	T.P.# 52 SEE THIS BOOK PAGE 56
3.315	3.315	1252.514			1249.199	
2.409			5.11			
			3.47	3.47	1247.544	T.P.# 1 IKZ Hub
3.26			1.83			
1.96	1.96	1251.004				
0.66			4.86			
			3.595	3.592	1247.412	T.P.# 2 IKZ Hub
9.40			2.32			
7.65	7.65	1255.062				
5.90						

	+	HI	-	ELEV	REMARKS
		1255062			
			3.455		
			2.045	2047	T.P.# 3 1X2 Hub
7.975			0.64		
6.31	6308	1259323			
4.64			6.41		
			5.055	5058	1254265 T.P.# 4 1X2 Hub
9.54			3.71		
8.07	8.07	1262335			
6.60			5.02	Adj 1258.227	
			4.06	1258275	PANEL# W046 SECCOR. OF 1/2" 4 P 72 N R5W 080 ABOVE GROUND
6.575			3.10		
5.475	5.477	1263752			
4.38			478.		
			3.50	3.497	1260.255 T.P.#5 60 D NAIL
8.158			2.21		
7.005	7.006	1267261			
5.855			3.33		
			2.225	2.222	1266.039 T.P.# 6 " " "
9.63			1.11		
8.30	830	1273339			
6.97			4.73		
			3.35	3.35	1269.789 T.P.# 7 " " "
9.30			1.97		
8.085	8.087	1278.076			
6.875					

+		HI	-		ELEV	REMARKS
		1278.076	4.16			
8.28			2.80	2.797	1275.279	T.P.#8 60 D NAIL
7.09	7.093	1282.372	1.43			
5.91			4.70			
			3.335	3.337	1279.035	T.P.#9 " " "
6.256			1.975			
5.642	5.64	1284.675				
5.022			5.045	Adj	1280.175	
			4.462	4.464	1280.211	PANEL# W042 GLO B.C. 1/4 COR OF 6#7 0.85
7.365			3.885			ABOVE GROUND
5.97	5.968	1286.179				
4.57			4.085			
			2.77	2.768	1283.411	T.P.#10 '60 D NAIL
9.15			1.45			
7.77	7.768	1291.179				
6.385			6.24			
			4.825	4.828	1286.351	T.P.#11 " " "
10.19			3.42			
8.82	8.185	1295.169				
7.445			5.99			
			4.50	4.502	1290.667	T.P.#12 " " "
9.65			3.015			
8.265	8.265	1298.932				
6.88						

	+	HI	-	ELEV	REMARKS
		1298.932			
			4.795		
			3.35		
9.19			1.90		
8.21	8.212	1303.796	3.348	1295.584	T.P.#13 60 D NAIL
7.235					
			3.21	Adj 1301.685	
			2.085	1301.711	
11.15			0.96		PANEL # W045 SEC. COR OF $\frac{6}{7} \frac{5}{8}$ & T2N R4W
9.82	9.82	1311.531			0.90 ABOVE GROUND
8.49			6.045		
			4.62		
			4.617	1306.914	T.P.#14 60 D NAIL
7.245			3.185		
6.23	6.227	1313.141			
5.205			4.04		
			2.75		
			2.748	1310.393	T.P.#15 " " "
10.08			1.455		
8.74	8.737	1319.13			
7.39			5.87		
			4.47		
			4.47	1314.66	T.P.#16 " " "
11.80			3.07		
10.30	10.30	1324.96			
8.80			5.88		
			4.44		
			4.443	1320.517	T.P.#17 " " "
10.095			3.01		
8.895	8.895	1329.412			
7.695					

	+	HI		-	ELEV		REMARKS
		1329.412	4.895				
9.66			3.49	3.492	1325.92	T.P.#18	60 D NAIL
8.05	8.05	1333.97	2.09				
6.44			4.29				
			2.99	2.992	1330.978	T.P.# 19	" " "
10.52			1.695				
9.30	9.297	1340.275					
8.07			3.17				
			1.92	1.917	1338.358	T.P.# 20	" " "
9.49			0.66				
8.07	8.072	1346.43					
6.655			4.345				
			2.915	2.913	1343.517	T.P.# 21	" " "
9.46			1.48				
8.07	8.071	1351.588					
6.683			2.95				
			1.71	1.71	1349.878	T.P.#22	" " "
6.495			0.47				
5.28	5.282	1355.16					
4.07			3.66				
			3.055	3.055	1352.105	T.P.# 23	1X2 HUB
7.585			2.45				
7.07	7.071	1359.176					
6.558							

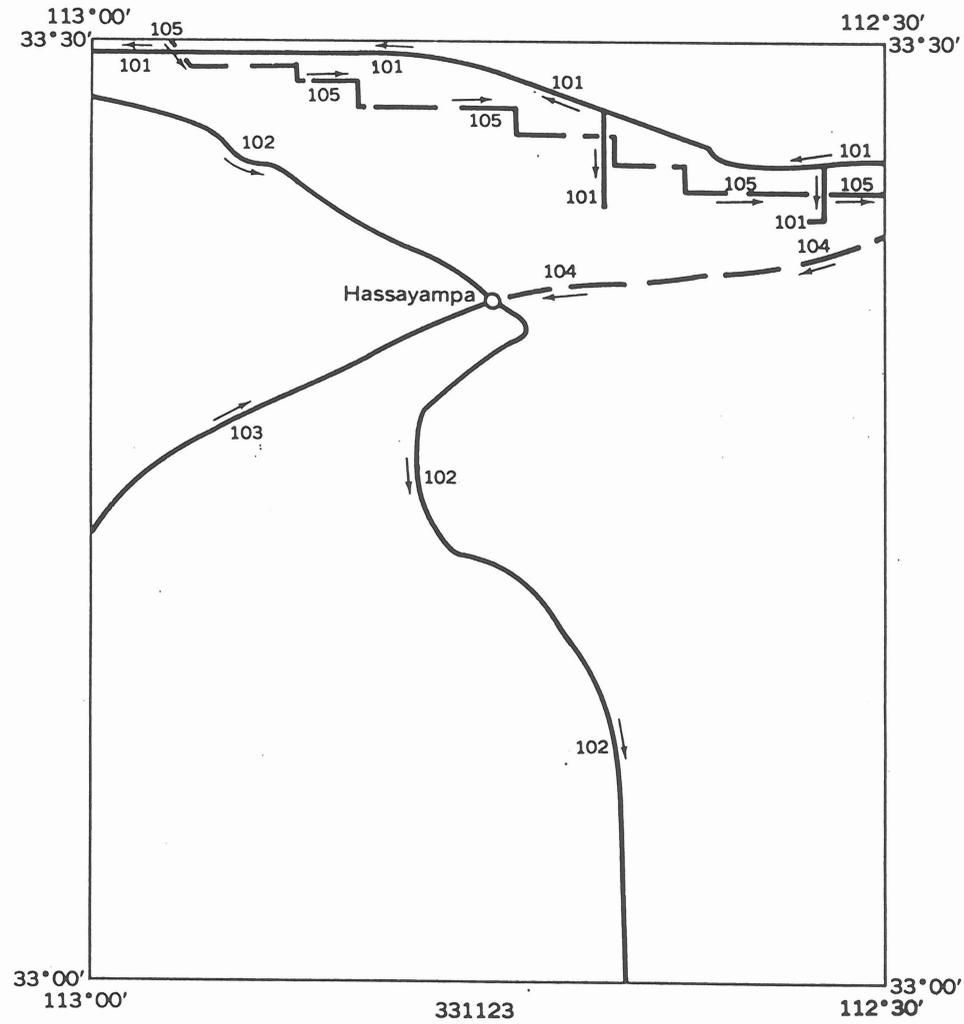
SEPTEMBER 1970

U. S. DEPARTMENT OF COMMERCE
ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION
COAST AND GEODETIC SURVEY

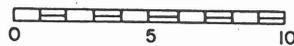
VERTICAL CONTROL DATA

by the
Coast and Geodetic Survey
SEA-LEVEL DATUM OF 1929

QUAD - - - - - 331123
ARIZ.
LATITUDE 33°00' TO 33°30'
LONGITUDE 112°30' TO 113°00'
DIAGRAM NI 12-7 PHOENIX



REPLACES EARLIER LISTS



USCOMM-ESSA-ASHEVILLE

SEPTEMBER 1970

U.S. DEPARTMENT OF COMMERCE
ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION
COAST AND GEODETIC SURVEY

REPLACES ELEV. DATED AUG. 1964

VERTICAL CONTROL DATA

by the
Coast and Geodetic Survey
SEA-LEVEL DATUM OF 1929

QUAD 331123 PAGE NO. 1
ARIZ.
LATITUDE 33°00' TO 33°30'
LONGITUDE 112°30' TO 113°00'
DIAGRAM NI 12-7 PHOENIX

LINE 101
(First-order)

This line follows Yuma Rd. and Indian School Rd. W to the end of the quad.

The original field work (L-12530) was done in the winter of 1947-48 by a party supervised by E.B. Brown, Jr. The line was relevelled (L-21029) in 1967 by a party supervised by C.N. Davis with the exception of the spur lines.

The original elevations are based on a supplementary adjustment of 1949, the 1967 leveling is based on a supplementary adjustment of 1967.

BENCH MARK	ADJUSTED (Meters)	ELEVATION (Feet)
R 264		DESTROYED
TL ZJ 5 (USE)	309.658	1015.936
D 366	316.787	1039.325
P 264	325.586	1068.193

SPUR LINE SOUTH TO BENCH MARK U 264

T 264	NOT LEVELED TO	
U 264	NOT LEVELED TO	

END OF SPUR LINE

N 264	327.736	1075.247
M 264	328.948	1079.224
L 264	333.179	1093.105
K 264	334.322	1096.855
C 366	350.199	1148.945
*J 264	351.370	1152.786
W 362	360.069	1181.326
H 264	349.990	1148.259
TL ZB 4 (USE)	346.330	1136.251
G 264	350.158	1148.810
A 264	349.272	1145.903
B 264	348.296	1142.701

SPUR LINE TO LUKE NO. 5 AIRPORT

C 264	330.383	1083.932
D 264	314.575	1032.068

LINE 101
(Continued)

BENCH MARK ADJUSTED (Meters) ELEVATION (Feet)

E 264	313.718	1029.256
F 264	302.832	993.541

END OF THE SPUR LINE

*Z 263	346.860	1137.990
Y 263	344.102	1128.941

TL YX 3 (USE)	336.785	1104.935
TL YX 2 (USE)	346.411	1136.517
X 263	340.342	1116.605
V 362	341.994	1122.025
W 263	343.982	1128.548

V 263	326.047	1069.706
R 263	343.978	1128.534
*U 263	347.637	1140.539
*T 263	342.370	1123.259
U 362	347.595	1140.401

*S 263	346.654	1137.314
*Q 263	346.003	1135.178
*P 263	342.376	1123.279
*N 263	341.187	1119.378
T 362	340.006	1115.503

M 263	DESTROYED	
S 362	337.351	1106.792
L 263	DESTROYED	
*K 263	336.690	1104.624
*J 263	335.737	1101.497

H 263	DESTROYED	
*TONOPAH RM 1	343.890	1128.246
TONOPAH RM 3	343.987	1128.564
*TONOPAH	344.143	1129.076
TONOPAH RM 2	DESTROYED	

*TONOPAH AZI	346.112	1135.536
G 263	353.351	1159.286
R 362	359.062	1178.023
F 263	DESTROYED	

LINE 102
(First-order)

This line follows the Buckeye-Salome Rd. and the Arlington-Hassayampa Rd. SE to the end of the quad.

The original field work (260) was done in 1927 by a party supervised by C.M. Thomas. Releveling (L-14470) was done from BM J-13 to BM Q-10 in March 1952 by a party supervised by J.R. Plaggmier. The line was relevelled (L-21029) in 1967 by a party supervised by C.N. Davis.

These elevations are all based on a supplementary adjustment of 1967.

BENCH MARK ADJUSTED (Meters) ELEVATION (Feet)

N 362	356.022	1168.049
M 362	346.008	1135.195
F 13	338.486	1110.516
L 362	329.637	1081.484

K 362	325.043	1066.412
J 362	315.532	1035.208
SEC. COR. (USGLO)	DESTROYED	
H 362	310.812	1019.722
*Q 13	307.472	1008.764
Q 362	305.706	1002.970

F 362	305.766	1003.167
E 362	304.185	997.980
H 13	DESTROYED	
D 362	301.987	990.769
C 362	290.031	951.543
B 362	288.998	948.154
J 13	291.325	955.789
A 362	281.770	924.440

AT LUKE AIR FORCE BASE
AUXILIARY FIELD NO. 7

*H 322	279.707	917.672
G 322	NOT LEVELED TO	

END OF AIRPORT LEVELING

Z 360	279.868	918.200
K 13	267.423	877.370

LINE 102
(Continued)

BENCH MARK ADJUSTED (Meters) ELEVATION (Feet)

*Q 10	258.845	849.227
Y 360	284.128	932.177
X 360	272.365	893.584
Z 361	244.768	803.043
L 13	DESTROYED	
452+32.92 (AHD)	245.001	803.807

Y 361	241.903	793.643
X 361	244.967	803.696
*M 13	244.035	800.638
248+31.7 (AHD)	239.187	784.733
W 361	236.599	776.242

*N 13	239.384	785.379
V 360	237.668	779.749
W 360	232.677	763.374
V 361	254.508	834.998
U 361	262.049	859.739

*P 13	227.513	746.432
*Q 13	227.516	746.442
T 361	228.981	751.248
BM 2 (USDI)	NOT RECOVERED	
763.84 (USDI)	NOT LEVELED TO	

S 361	228.429	749.437
R 361	227.905	747.718
*R 13	228.077	748.283
Q 361	227.881	747.640
P 361	228.001	748.033
N 361	227.050	744.913

S 13	DESTROYED	
M 361	227.174	745.320
L 361	226.127	741.885
*T 13	226.305	742.469
K 361	224.412	736.258

643+00 (AHD)	223.725	734.004
*U 13	216.190	709.283
J 361	217.169	712.495
H 361	212.969	698.716
G 361	209.688	687.951

V 13	DESTROYED	
W 13	DESTROYED	
F 361	208.936	685.484
E 361	214.708	704.421

D 361	219.064	718.712
C 361	224.321	735.960

*Changed elevation.

U. S. DEPARTMENT OF COMMERCE
 ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION
 COAST AND GEODETIC SURVEY

VERTICAL CONTROL DATA

by the
 Coast and Geodetic Survey
 SEA-LEVEL DATUM OF 1929

QUAD 331123 PAGE NO. 4
 ARIZ.
 LATITUDE 33°00' TO 33°30'
 LONGITUDE 112°30' TO 113°00'
 DIAGRAM NI 12-7 PHOENIX

SPUR LINE TO LUKE NO. 5 AIRPORT

DESCRIPTION OF BENCH MARK

Form 685A
 (1-8-58)

U. S. DEPARTMENT OF COMMERCE
 COAST AND GEODETIC SURVEY

RECOVERY NOTE, BENCH MARK

R

Designation C 264 State Arizona County Maricopa
 Nearest town Buckeye County Maricopa Chief of Party C.A. Annis
 Distance and direction from nearest town 11.4 miles northwest Recovery Date August 1962
 Character of mark A C&GS bench mark disk Stamping C 264 1947
 Established by C&GS
 Present condition Good

Detailed report Mark was recovered by following original description. Mark may also be reached from the Valloy National bank at Buckeye by going 0.2 mile west along U.S. Highway 80, thence 4.5 miles north along Miller Road, thence 5.5 miles west along the Tonopah Road, thence 1.2 mile south along a gravel road leading to Luke No. 5 Airport, 40.2 feet west of the center of the road, 4.0 feet northeast of a white wooden witness post, about level with the road, and set in top of a concrete post projecting 4 inches.

Designation F 264 State Arizona County Maricopa
 Nearest town Buckeye County Maricopa
 Distance and direction from nearest town 13.0 miles northwest
 Character of mark Bronze disk Stamping F 264 1947
 Established by U. S. Coast & Geodetic Survey
 Detailed description 0.3 mile west along the Southern Pacific Railroad from the station at Buckeye, thence 3.8 miles north along an asphalt and a gravel road, thence 5.5 miles west along the Tonopah Road, thence 3.4 miles south along a dirt road leading to Luke NO. 5 Airport, at the main entrance to the Luke NO. 5 Airport, 68.8 feet north of the southeast corner of the airport, 36.6 feet north of the center line of the main entrance to the airport, 35.7 feet west of the center line of a north-south road, 1.0 foot east of the north-south boundary fence, 2.1 feet south of a white wooden witness post, about level with the road, set in the top of a concrete post projecting 4 inches.

END OF THE SPUR LINE

DESCRIPTION OF BENCH MARK

Designation D 264 State Arizona County Maricopa
 Nearest town Buckeye County Maricopa
 Distance and direction from nearest town 12.0 miles northwest
 Character of mark Bronze disk Stamping D 264 1947
 Established by U. S. Coast & Geodetic Survey

Detailed description 0.3 mile west along the Southern Pacific Railroad from the station at Buckeye, thence 3.8 miles north along an asphalt and a gravel road, thence 5.5 miles west along the Tonopah Road, thence 2.4 miles south along a dirt road leading to Luke NO. 5 Airport, at the northeast corner of the airport, 51.5 feet west of the center line of the road, 1.2 feet east of the northeast corner wooden fence post of the airport, 1.0 foot east of the north-south boundary fence, 0.6 foot south of the prolongation of the east-west boundary fence, 2.2 feet south of a white wooden witness post, about level with the road, set in the top of a concrete post projecting 4 inches.

DESCRIPTION OF BENCH MARK

Designation E 264 State Arizona County Maricopa
 Nearest town Buckeye County Maricopa
 Distance and direction from nearest town 12.0 miles northwest
 Character of mark Bronze disk Stamping E 264 1947
 Established by U. S. Coast & Geodetic Survey

Detailed description 0.3 mile west along the Southern Pacific Railroad from the station at Buckeye, thence 3.8 miles north along an asphalt and a gravel road, thence 5.5 miles west along the Tonopah Road, thence 2.4 miles south along a dirt road leading to Luke NO. 5 Airport, at Luke NO. 5 Airport, 0.2 mile west along the north boundary wire fence from the northeast corner of the airport, in line with the center of the prolongation of a north-south runway, 8.8 feet south of a east-west road, 1.2 feet north of the north boundary fence, 2.5 feet east of a white wooden reference post, about level with the road, set in the top of a concrete post projecting 4 inches.

RECOVERY NOTE, BENCH MARK

R

Designation Z 263 State Arizona County Maricopa
 Nearest town Buckeye Described in Chief of party Carl N. Davis
 Distance and direction from nearest town 10.05 miles northwest Recovery date March 1967
 Character of mark A C&GS B.M. Disk Established by C&GS Stamping Z 263 1947
 Also horizontal control point Present condition Good
 Detailed report 0.3 mile west along the Southern Pacific Railroad from the station at Buckeye, thence 3.8 miles north along Miller Road, thence 5.95 miles northwest along Yuma Road, in S 32, T 2 N, R 4 W, 35 feet south of the center line of the road, 87 feet west of the center line of a narrow wash, 1.7 feet south of a metal witness post, about 2 feet above the level of the road, and set in the top of a concrete post projecting 6 inches.

RECOVERY NOTE, BENCH MARK

R

Designation Y 263 State Arizona County Maricopa
 Nearest town Buckeye Described in Chief of party Carl N. Davis
 Distance and direction from nearest town 11.05 miles northwest Recovery date March 1967
 Character of mark A C&GS B.M. Disk Established by C&GS Stamping Y 263 1947
 Also horizontal control point Present condition Good
 Detailed report 0.3 mile west along the Southern Pacific Railroad from the station at Buckeye, thence 3.8 miles north along Miller Road, thence 6.95 miles northwest along Yuma Road, in S 31, T 2 N, R 4 W, 117 yards northeast of a brick building housing telephone equipment, 76 yards east of underground telephone cable marker post number 5, 35 feet south of the center line of the road, 39 feet east of the center line of a narrow wash, 3.3 feet northwest of a 4- by 4-inch wooden witness post, about 2 feet above the level of the road, and set in the top of a concrete post projecting 6 inches.

U.S. DEPARTMENT OF COMMERCE
 ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION
 COAST AND GEODETIC SURVEY

VERTICAL CONTROL DATA

by the
 Coast and Geodetic Survey
 SEA-LEVEL DATUM OF 1929

QUAD 331123 PAGE NO. 5
 ARIZ.
 LATITUDE 33°00' TO 33°30'
 LONGITUDE 112°30' TO 113°00'
 DIAGRAM NI 12-7 PHOENIX

LINE 101

DESCRIPTION OF BENCH MARK

Designation TL-YX-3 (U.S.E.) State Arizona County Maricopa
 Nearest town Buckeye County Maricopa Chief of party Carl N. Davis
 Distance and direction from nearest town 12.3 miles northwest Levelling date March 1967
 Character of mark A U.S. Engineers Disk Stamping TL-YX-3 1960 ARMY
 Established by U.S. Engineers MAP SERVICE
 Detailed description 0.3 mile west along the Southern Pacific Railroad from the station at Buckeye, thence 3.8 miles north along Miller Road, thence 7.6 miles west along Yuma Road, thence 0.6 mile south along a dirt road, in S 36, T 2 N, R 5 W, 35 feet west of the center line of the dirt road, 22 feet north of an east-west fence line, about 1½ feet above the level of the road, in the center of a 6-foot circle that is banded by a 4-foot circle of rocks which are painted black, and set in the top of a concrete post projecting 3 inches.

DESCRIPTION OF BENCH MARK

Designation V 362 State Arizona County Maricopa
 Nearest town Tonopah County Maricopa Chief of party Carl N. Davis
 Distance and direction from nearest town 12.15 miles east Levelling date March 1967
 Character of mark C&GS B.M. Disk on a Copper Coated Rod Stamping V 362 1967
 Established by C&GS
 Detailed description 12.15 miles east along Indian School Road, which becomes Yuma Road, from the post office at Tonopah, or about 0.3 mile west along the Southern Pacific Railroad from the station at Buckeye, thence 3.8 miles north along Miller Road, thence 8.35 miles northwest along Yuma Road, which becomes Indian School Road, in S 36, T 2 N, R 5 W, 117 yards east of the center line of a sandy wash, 78 feet south of the center line of the road, 1.2 feet south of a metal witness post, about 2 feet above the level of the road, and on the top of a 5/8-inch copper coated rod that is driven to a depth of 9 feet and is encased in a 5-inch iron pipe projecting 12 inches.

DESCRIPTION OF BENCH MARK

Designation TL-YX-2 (U.S.E.) State Arizona County Maricopa
 Nearest town Buckeye County Maricopa Chief of party Carl N. Davis
 Distance and direction from nearest town 12.1 miles northwest Levelling date March 1967
 Character of mark A U.S. Engineers Disk Stamping TL-YX-2 1960 ARMY
 Established by U.S. Engineers MAP SERVICE
 Detailed description 0.3 mile west along the Southern Pacific Railroad from the station at Buckeye, thence 3.8 miles north along Miller Road, thence 7.6 miles west along Yuma Road, thence 0.4 mile north along a trail road, in S 36, T 2 N, R 5 W, 23 feet west of the center line of the road, 78 feet northwest of the center of a wash which crosses the road, 85 feet south of a saguaro cactus, in the center of a 6-foot circle that is banded by a 4-foot circle of rocks that are painted black, about 1 foot above the level of the road, and set in the top of a concrete post projecting 2 inches.

RECOVERY NOTE, BENCH MARK

Designation W 263 State Arizona County Maricopa
 Nearest town Tonopah Described in Chief of party Carl N. Davis
 Distance and direction from nearest town 11.55 miles east Recovery date March 1967
 Character of mark A C&GS B.M. Disk Established by C&GS Stamping W 263 1947
 Also horizontal control point Present condition Good
 Detailed report: 11.55 miles east along Indian School Road from the post office at Tonopah, in S 26, T 2 N, R 5 W, 0.1 mile west of the junction of Indian School Road and a trail road, 202 feet northeast of underground telephone cable marker post number 168, 38 feet south of the center line of the road, 2.8 feet south of a 4- by 4-inch wooden witness post, about 1 foot above the level of the road, and set in the top of a concrete post projecting 6 inches.

R

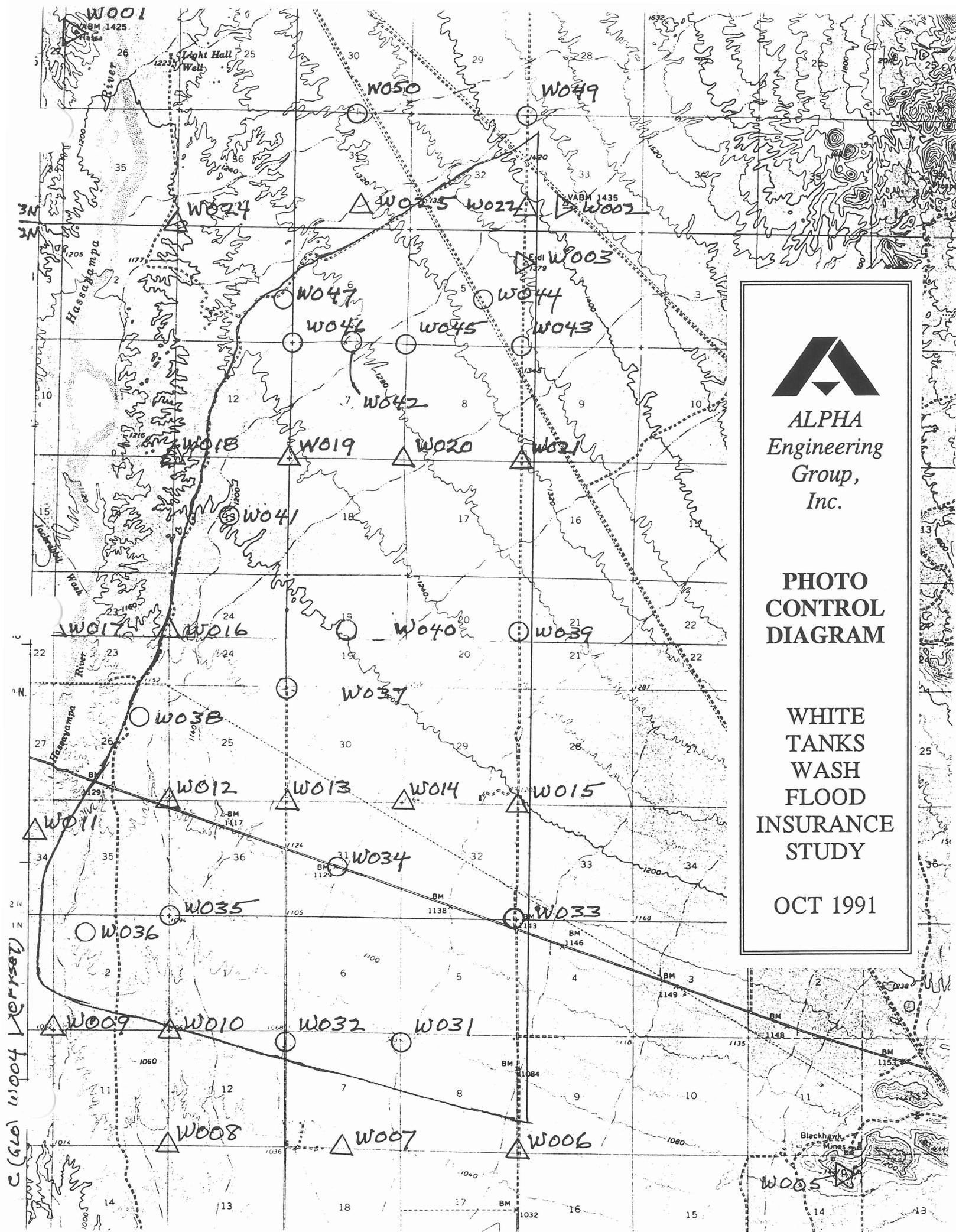
RECOVERY NOTE, BENCH MARK

Designation X 263 State Arizona County Maricopa
 Nearest town Buckeye Described in Chief of party Carl N. Davis
 Distance and direction from nearest town 12.05 miles northwest Recovery date March 1967
 Character of mark A C&GS B.M. Disk Established by C&GS Stamping X 263 1947
 Also horizontal control point Present condition Good
 Detailed report: 0.3 mile west along the Southern Pacific Railroad from the station at Buckeye, thence 3.8 miles north along Miller Road, thence 7.95 miles northwest along Yuma Road, which becomes Indian School Road, or about 12.55 miles east along Indian School Road, which becomes Yuma Road, from the post office at Tonopah, in S 36, T 2 N, R 5 W, 55 yards west of the center line of a gravelled wash, 34 feet south of the center line of the road, 3.4 feet northwest of a 4- by 4-inch wooden witness post, about 1½ feet above the level of the road, and set in the top of a concrete post projecting 4 inches.

RECOVERY NOTE, BENCH MARK

Designation V 263 State Arizona County Maricopa
 Nearest town Tonopah Described in Chief of party Carl N. Davis
 Distance and direction from nearest town 10.55 miles east Recovery date March 1967
 Character of mark A C&GS B.M. Disk Established by C&GS Stamping V 263 1947
 Also horizontal control point Present condition Good
 Detailed report: 10.55 miles east along Indian School Road from the post office at Tonopah, in S 27, T 2 N, R 5 W, 0.5 mile west of the Hassayampa River, 52 yards east of the center line of a sandy wash, 37 feet south of the center line of the road, 31 feet west of a mesquite tree, 2.7 feet south of a 4- by 4-inch wooden witness post, about 2 feet above the level of the road, and set in the top of a concrete post projecting 5 inches.

R



ALPHA
Engineering
Group,
Inc.

**PHOTO
CONTROL
DIAGRAM**

**WHITE
TANKS
WASH
FLOOD
INSURANCE
STUDY**

OCT 1991

LARGE BLOCK ADJUSTMENT
Problem 6

AERIAL MAPPING CO. INC.
WHITE TANKS - ALPHA ENGR F3
POINT COORDINATES

Tue, Jan 14 1992

Point Index	Point No.	Point Name	No. Of Images	Point Coordinates			DX	DY	DZ	
				X	Y	Z				
Control Points										
72	34501	W032	3	257578.888	891509.540	1092.209			0.287	
73	34502	W031	3	262953.145	891868.693	1081.809			0.144	
74	34503	W036	3	248337.032	896228.634	1089.120			0.010	
75	34504	W035	6	252344.117	897505.622	1092.890			0.177	
76	34505	W034	4	260078.855	899859.468	1130.004			0.417	
77	34506	W033	3	268142.772	897414.828	1147.637			-0.130	
78	34507	W038	3	250301.533	906211.980	1143.826			0.619	
79	34508	W040	6	260332.468	911468.025	1206.685			-0.023	
80	34509	W039	2	268228.413	910570.976	1264.960			0.186	
81	34510	W041	2	254824.088	915467.102	1200.074			0.181	
82	34511	W047	2	257171.410	925929.149	1265.913			0.109	
83	34512	W046	2	257725.488	923883.535	1257.430			-0.511	
84	34513	W042	4	260288.407	923914.948	1279.320			0.198	
85	34514	W045	2	262930.743	923836.023	1300.780			0.453	
86	34515	W043	2	268220.627	923814.713	1357.260			0.057	
87	34516	W044	2	266476.766	925543.958	1340.620			0.254	
88	34800	W008	2	252256.800	886963.197	1029.400	-1.017	-0.434	-1.534	
89	34801	W009	2	247010.572	892272.483	1052.730	0.000	0.100	-0.124	
90	34802	W010	5	252288.072	892246.883	1063.980	0.094	-0.140	-0.103	
91	34803	W007	4	260142.410	886856.402	1036.324	0.114	0.114	-0.340	
92	34804	W006	2	268147.336	886658.586	1050.986	0.176	-0.343	-0.152	
93	34806	W012	6	252399.170	902759.601	1123.665	-0.095	0.094	-0.249	
94	34807	W013	3	257612.689	902746.659	1133.940	0.083	0.114	0.039	
95	34809	W015	3	268173.314	902637.716	1195.830	-0.078	-0.134	-0.047	
96	34810	W017	2	247068.293	911631.649	1102.690	-0.174	0.152	-0.504	
97	34811	W016	4	252322.601	910690.423	1171.312	0.066	0.023	-0.178	
98	34812	W018	2	252392.103	918631.945	1213.021	-0.099	0.061	0.145	
99	34813	W019	2	257694.097	918599.050	1235.540	0.150	0.140	-0.418	
100	34814	W020	3	262890.862	918551.558	1273.030	-0.076	-0.094	-0.137	
101	34815	W021	3	286238.985	918518.630	1322.440	0.050	0.023	-0.013	
102	34816	W024	2	252479.825	929202.451	1199.800	-0.219	0.130	-0.310	
103	34817	W025	4	260676.088	930365.074	1315.181	0.031	-0.110	-0.179	
107	34901	W022	2	268462.754	930607.557	1407.554	0.245	-0.044	-0.437	
							RMSE	0.276	0.167	0.381
								0.323		
							MEAN	-0.044	-0.020	-0.065

WHITE TANKS WASH FLOOD INSURANCE STUDY for FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
 AERIAL SURVEY CONTROL COORDINATES HORIZONTAL AND VERTICAL
 ALPHA ENGINEERING GROUP INC, 2929 E CAMELBACK, PHOENIX AZ 85016

Printed 11/02/93
 Updated to 10/24/93
 F:\WT\WTWCONT2.WQ1

STATE PLANE COORDINATES FROM GEODETIC POSITIONS IN NAD27 DATUM
 McEwen Global Positioning Systems, Inc.

ELEVATIONS FROM DIFFERENTIAL LEVELS NGVD 1929
 Brooks, Hersey & Assoc., Inc.

PT#	DESCRIPTION	LATITUDE N		LONGITUDE W		X (East)	Y (North)	ZONE	CONVERGENCE	SCALE FACTOR	DESC	ELEVATION FT		POINT #		
		33	34	112	44							260142.410	886856.402		CAP	PANEL
W001	STA "HASSA" (USC&GS)	33	34	32.82700	112	44	41.47900	247752.037	938001.561	AZ C	-0 27 28.96	0.9999728539	Brass Cap		W001	
W002	STA "POLE 842"(USC&GS)	33	33	18.64400	112	40	15.64600	270188.783	930331.976	AZ C	-0 25 1.11	0.9999604703	Brass Cap		W002	
W003	STA "ERDL" (USC&GS)	33	32	51.42200	112	40	36.47500	268405.916	927593.491	AZ C	-0 25 12.32	0.9999614123	Brass Cap		W003	
W004	STA "GLO C 2" (USC&GS)	33	27	0.96420	112	46	51.26827	236390.518	892420.721	AZ C	-0 28 35.06	0.9999795667	Brass Cap		W004	
W005	STA "DEAD" (USC&GS)	33	25	59.37310	112	37	40.76200	282991.905	885842.219	AZ C	-0 23 30.94	0.9999539216	Brass Cap		W005	
W006	NE COR S17 T1N R4W	33	26	6.41091	112	40	35.98988	268147.336	886658.586	AZ C	-0 25 7.57	0.9999615510	Brass Cap	1050.986	1050.986	W006
W007	ECC N 1/4 S18 T1N R4W	33	26	7.77914	112	42	10.46248	260142.410	886856.402	AZ C	-0 25 59.65	0.9999658746	Panel		1036.324	W007
W008	NE COR. S14 T1N R5W	33	26	8.23607	112	43	43.51921	252256.800	886963.197	AZ C	-0 26 50.93	0.9999702772	Brass Cap	1029.906	1029.700	W008
W009	NE COR. S10 T1N R5W	33	27	0.35371	112	44	45.92210	247010.572	892272.483	AZ C	-0 27 25.95	0.9999732848	Brass Cap	1053.632	1052.730	W009
W010	NE COR. S11 T1N R5W	33	27	0.51277	112	43	43.63725	252288.072	892246.883	AZ C	-0 26 51.62	0.9999702592	Brass Cap	1065.079	1063.980	W010
W011	PANEL POINT	33	28	27.28901	112	45	5.18059	245449.397	901072.149	AZ C	-0 27 37.63	0.9999741917	Panel		1054.314	W011
W012	ECC NE S35 T1N R5W	33	28	44.52883	112	43	43.29577	252399.170	902759.601	AZ C	-0 26 52.66	0.9999701958	Panel		1123.665	W012
W013	NE COR. S36 T2N R5W	33	28	44.79984	112	42	41.74648	257612.689	902746.659	AZ C	-0 26 18.70	0.9999672708	Brass Cap	1133.435	1133.940	W013
W014	NE COR. S31 T2N R4W	33	28	44.76849	112	41	39.71068	262867.169	902703.707	AZ C	-0 25 44.48	0.9999643858	Brass Cap	1165.636	1165.140	W014
W015	NE COR. S32 T2N R4W	33	28	44.50432	112	40	37.06279	268173.314	902637.716	AZ C	-0 25 9.91	0.9999615366	Brass Cap	1195.212	1195.830	W015
W016	ECC E 1/4 S23 T2N R5W	33	30	2.98608	112	43	44.93235	252322.601	910690.423	AZ C	-0 26 54.49	0.9999702388	Panel		1171.312	W016
W017	E 1/4 S22 T2N R5W	33	30	11.88676	112	44	47.06605	247068.293	911631.649	AZ C	-0 27 28.90	0.9999732506	L.S. Cap	1102.896	1102.690	W017
W018	NE COR. S14 T2N R5W	33	31	21.56022	112	43	44.84586	252392.103	918631.945	AZ C	-0 26 55.37	0.9999701991	Brass Cap	1214.021	1213.021	W018
W019	NE COR. S13 T2N R5W	33	31	21.64121	112	42	42.21888	257694.097	918599.050	AZ C	-0 26 20.78	0.9999672250	Brass Cap	1236.436	1235.540	W019
W020	NE COR. S18 T2N R4W	33	31	21.56118	112	41	40.83329	262890.862	918551.558	AZ C	-0 25 46.87	0.9999643723	Brass Cap	1273.932	1273.030	W020
W021	NE COR. S17 T2N R4W	33	31	21.62776	112	40	37.66105	268238.985	918518.630	AZ C	-0 25 11.98	0.9999615012	Brass Cap	1321.909	1322.440	W021
W022	PANEL POINT	33	33	21.24570	112	40	36.06455	268462.754	930607.557	AZ C	-0 25 12.42	0.9999613820	Panel		1407.554	W022
W024	NE COR. S2 T2N R5W	33	33	6.14496	112	43	44.78791	252479.825	929202.451	AZ C	-0 26 56.57	0.9999701489	Brass Cap	1200.902	1199.800	W024
W025	PANEL POINT	33	33	18.27231	112	42	8.05008	260676.088	930365.074	AZ C	-0 26 3.24	0.9999655800	Panel		1315.181	W025
W031		33	26	57.578	112	41	37.739	262953.145	891868.693	AZ C	-0 25 42.18	0.9999643395	Panel		1081.809	W031
W032		33	26	53.622	112	42	41.131	257578.888	891509.540	AZ C	-0 26 17.08	0.9999672900	Panel		1092.209	W032
W033	NE Cor S5 T1N R4W	33	27	52.829	112	40	36.972	268142.772	897414.828	AZ C	-0 25 9.29	0.9999615530	Brass Cap	1147.637	1147.637	W033
W034		33	28	16.421	112	42	12.374	260078.855	899859.468	AZ C	-0 26 2.17	0.9999659090	Panel		1130.004	W034
W035	NE Cor. S2 T1N R5W	33	27	52.541	112	43	43.933	252304.117	897505.622	AZ C	-0 26 52.40	0.9999702499	Brass Cap	1093.594	1092.890	W035
W036		33	27	39.598	112	44	30.639	248337.032	896228.634	AZ C	-0 27 18.00	0.9999725182	Rebar	1089.420	1089.120	W036
W037	NE Cor. S25 T2N R5W									AZ C	-0 49 18.19	1.0001864030	Brass Cap	1171.730	1171.980	W037
W038		33	29	18.522	112	44	8.381	250301.533	906211.980	AZ C	-0 27 6.90	0.9999713900	Panel		1143.826	W038
W039		33	30	2.997	112	40	37.098	268228.413	910570.976	AZ C	-0 25 10.80	0.9999615071	Panel		1264.960	W039
W040		33	30	11.290	112	42	10.418	260332.468	911468.025	AZ C	-0 26 2.41	0.9999657692	Panel		1206.685	W040
W041		33	30	50.437	112	43	15.831	254824.088	915467.102	AZ C	-0 26 38.98	0.9999688270	Panel		1200.074	W041
W042	N 1/4 Cor S7 T2N R4W	33	32	14.429	112	42	12.053	260288.407	923914.948	AZ C	-0 26 4.72	0.9999657929	Brass Cap	1280.175	1279.320	W042
W043	NE Cor. S8 T2N R4W	33	32	14.023	112	40	38.337	268220.627	923814.713	AZ C	-0 25 12.93	0.9999615107	Brass Cap	1356.570	1357.260	W043
W044		33	32	31.004	112	40	59.089	266476.766	925543.958	AZ C	-0 25 24.59	0.9999624397	Panel		1340.620	W044
W045	NE Cor. S7 T2N R4W	33	32	13.846	112	41	40.830	262930.743	923836.023	AZ C	-0 25 47.46	0.9999643505	Brass Cap	1301.685	1300.780	W045
W046	NE Cor. S12 T2N R5W	33	32	13.925	112	42	42.327	257725.488	923883.535	AZ C	-0 26 21.44	0.9999672073	Brass Cap	1258.227	1257.430	W046
W047		33	32	34.121	112	42	49.058	257171.410	925929.149	AZ C	-0 26 25.40	0.9999675150	Panel		1265.913	W047
W049	N 1/4 Cor S31 T3N R4W	33	33	58.140	112	40	37.354	268381.008	934337.364	AZ C	-0 25 13.54	0.9999614252	Panel		1429.776	W049
W050	NE Cor. S32 T3N R4W	33	34	3.374	112	42	14.411	260172.441	934927.684	AZ C	-0 26 7.27	0.9999658562	Panel		1311.429	W050

 **LIETZ**
SINCE 1882

241

241

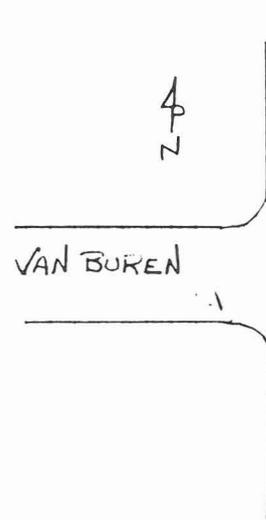
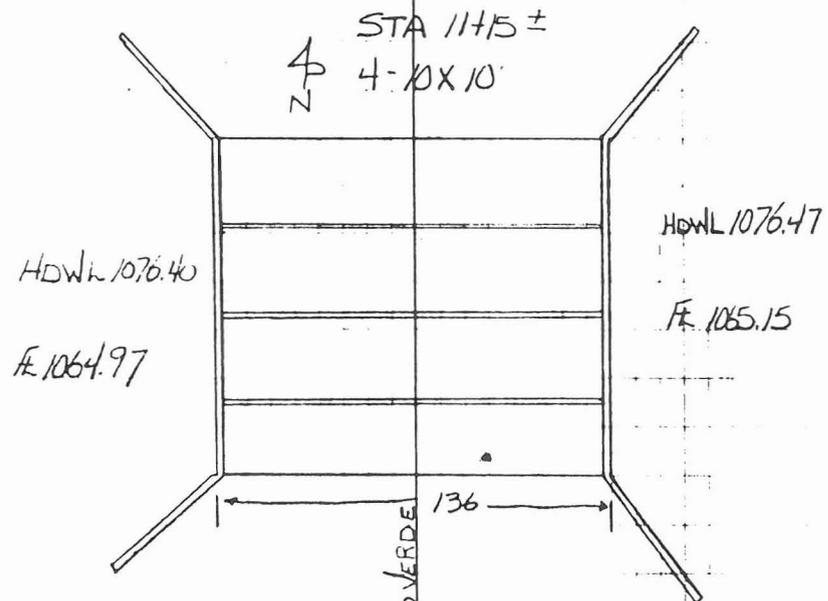
 **LIETZ**
SINCE 1882

TRANSIT FIELD BOOK

1
M. HOLLY
T. HURST

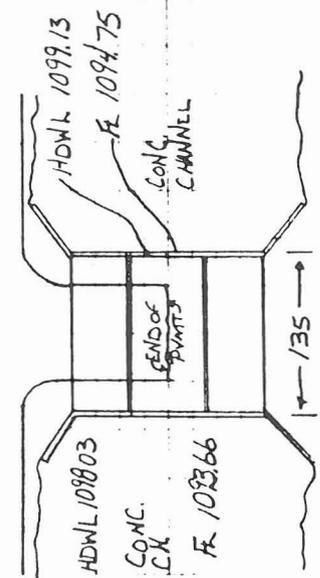
INVERT ELEVATIONS
BOX CULVERT
&
CONC. PIPES
ON PALO VERDE FL.

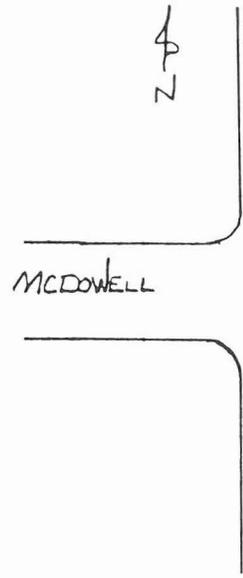
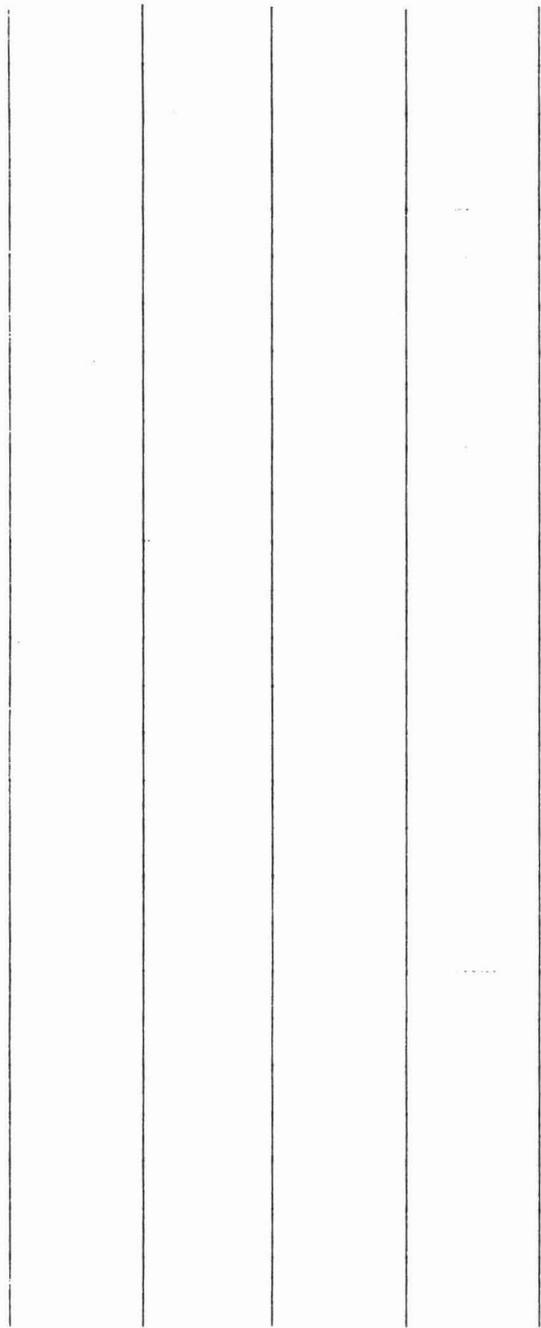
NOTE: ALL NUMBERS OF BOX
 CULVERTS ARE ON THE
 N.E. WING WALLS (★)



VAN BUREN

ETNA VERDE

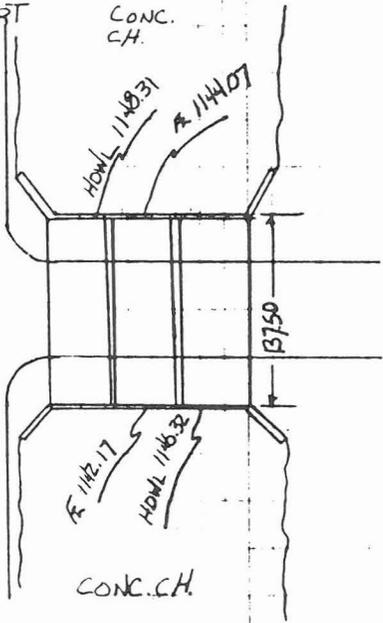


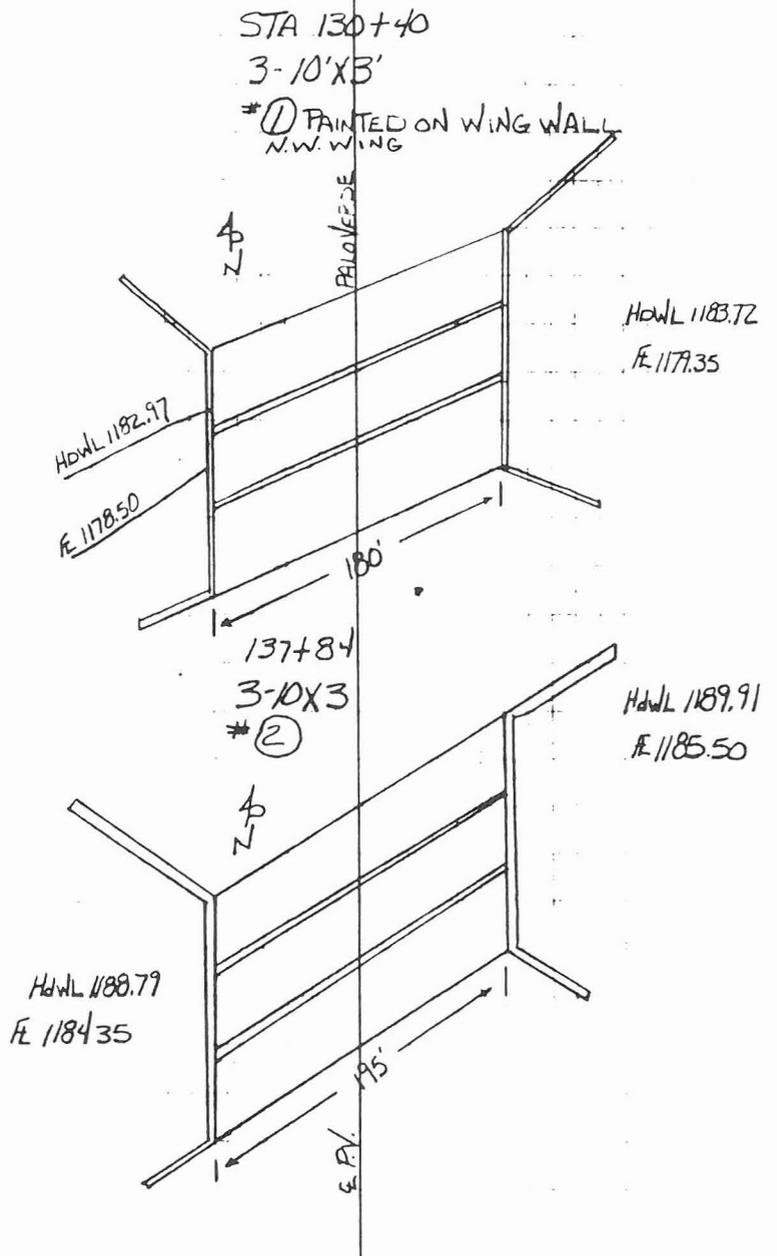
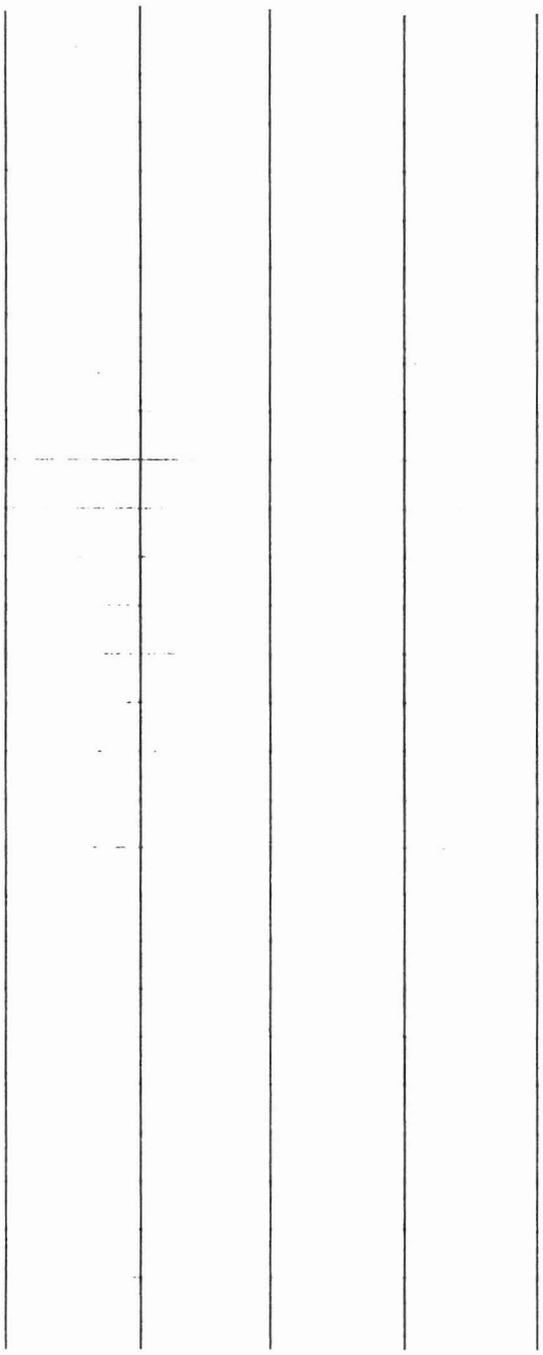


STA 90+13
2-8x3'

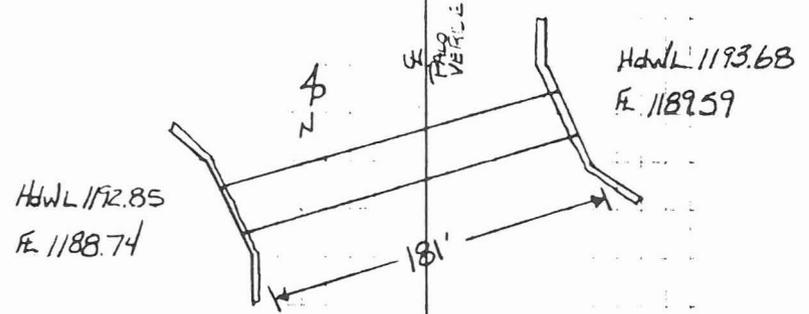
BOX CULVERT

CONC.
CH.

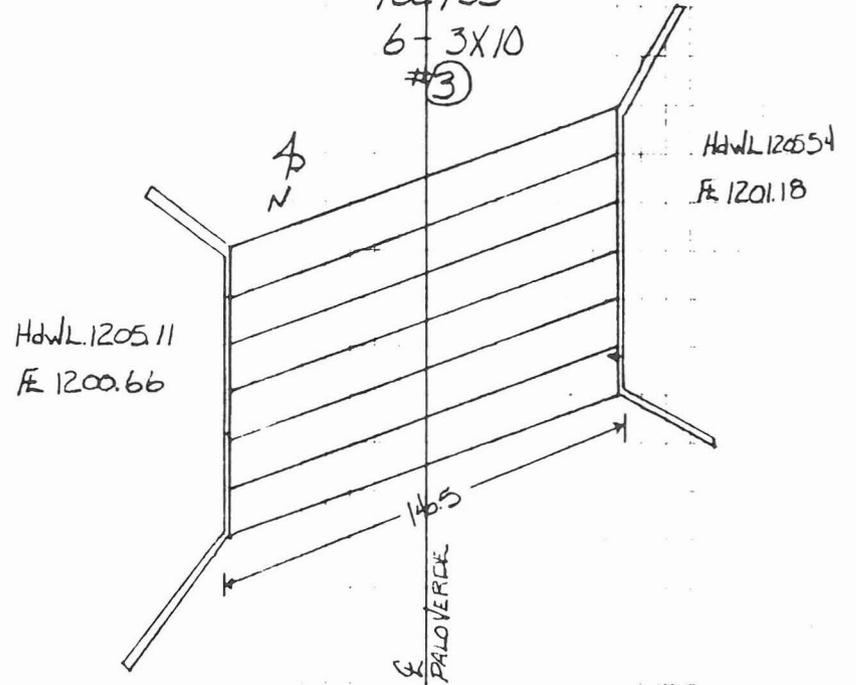




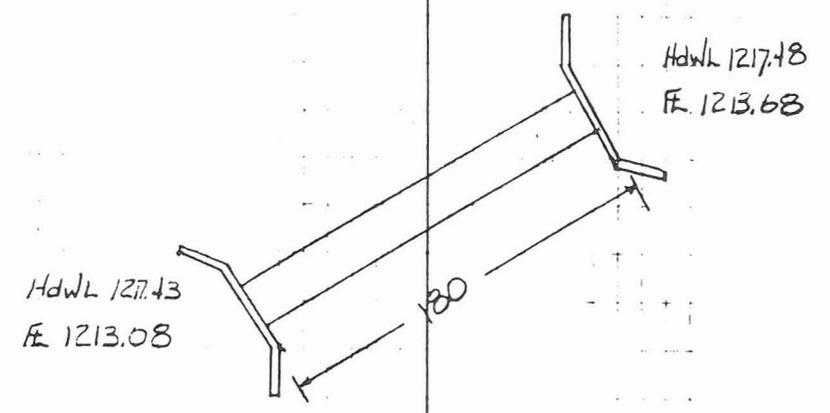
142+07 ±
1-40" CONC. PIPE



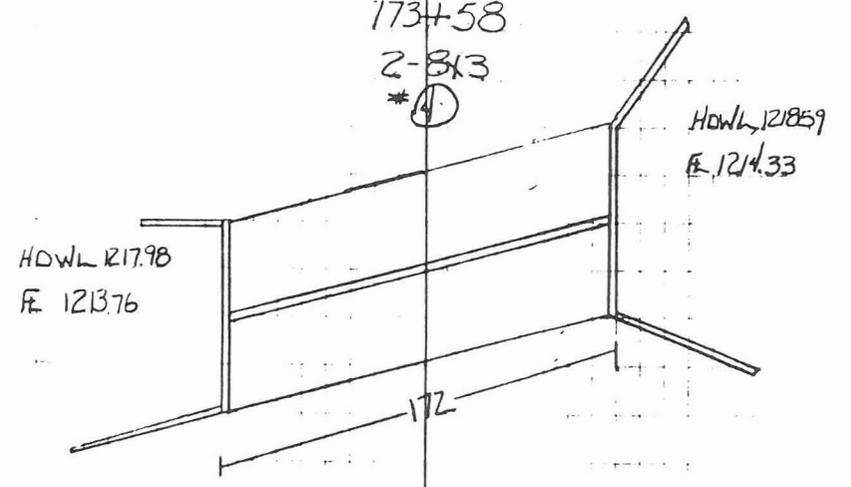
162+35
6-3X10
#3

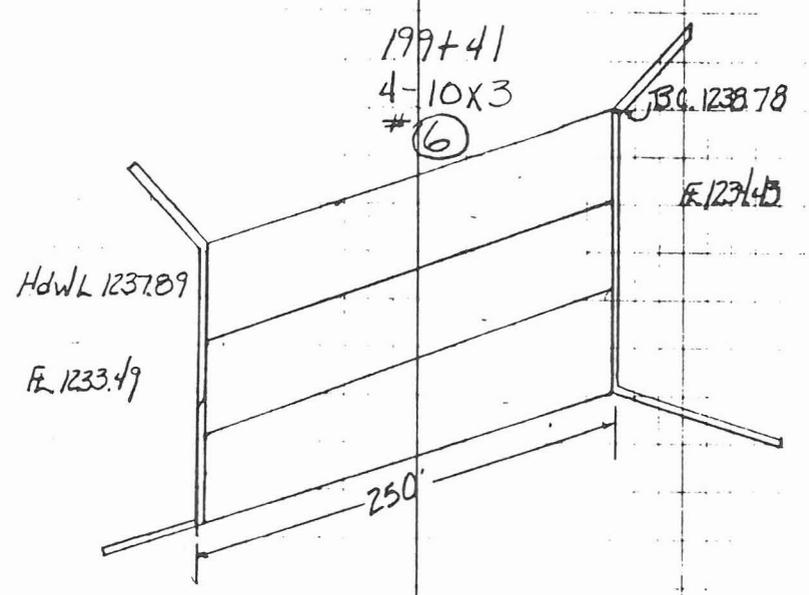
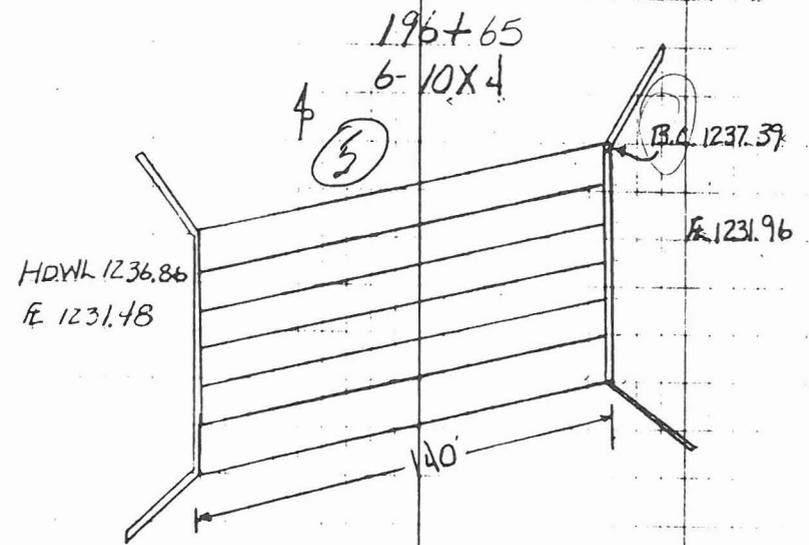


171+80±
1-30' CONC. PIPE

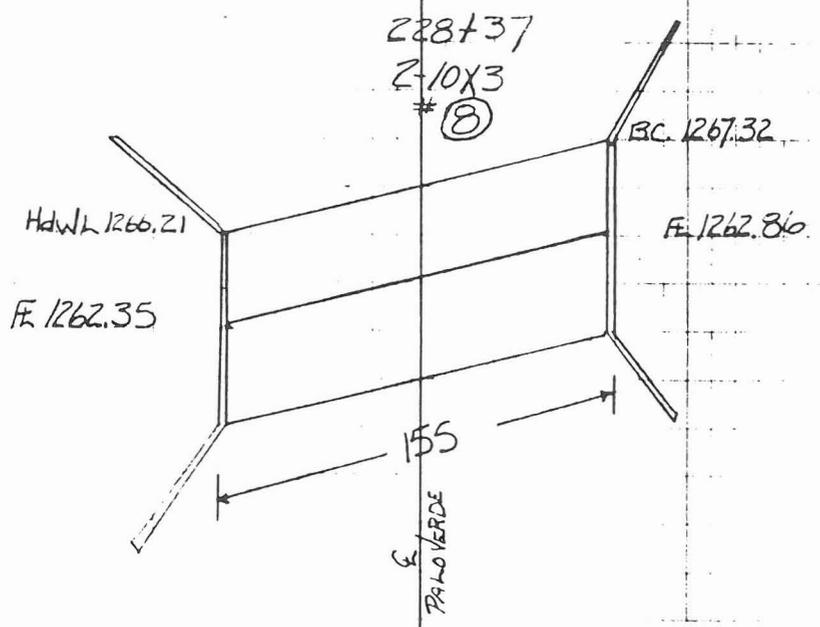
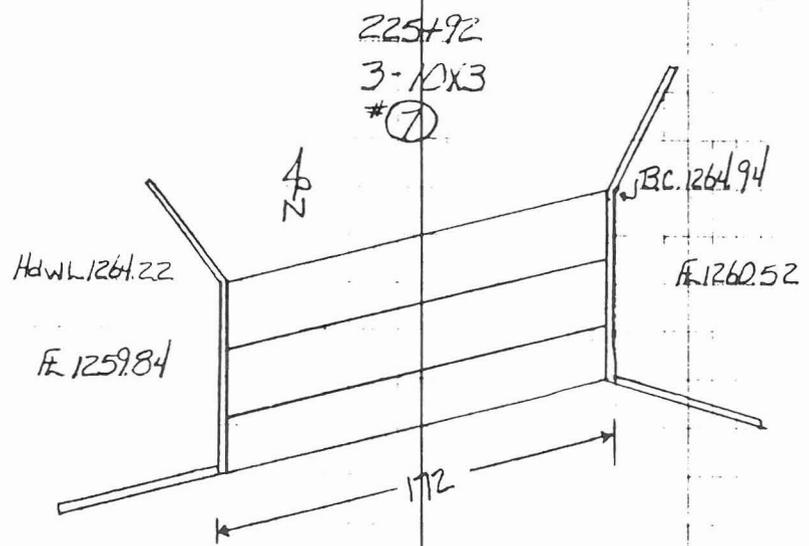


173+58
2-3x3
*④

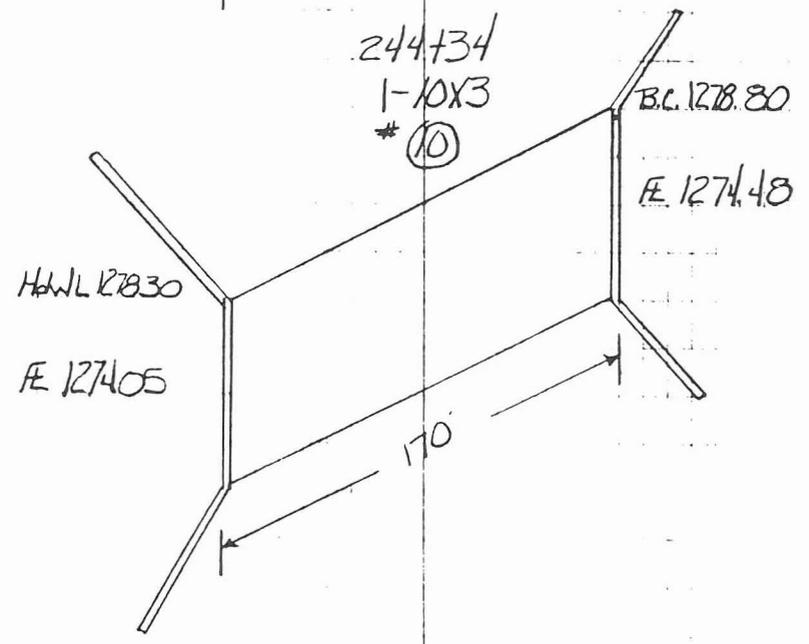
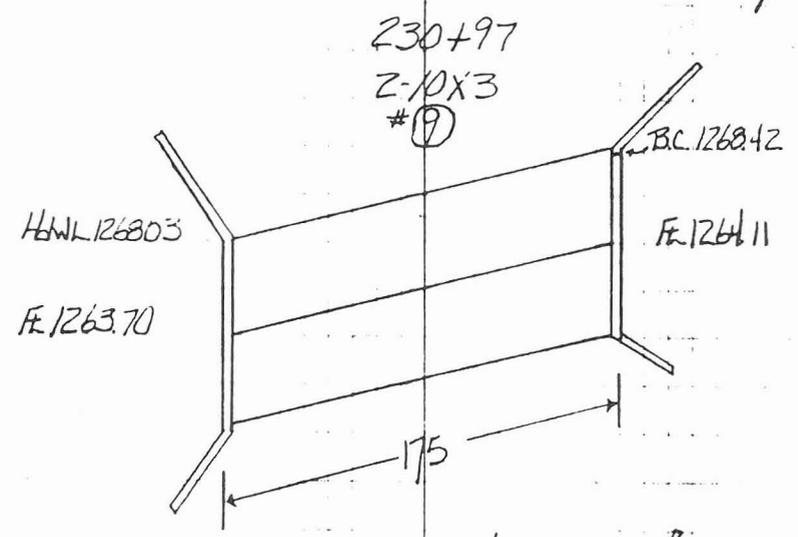




8



9

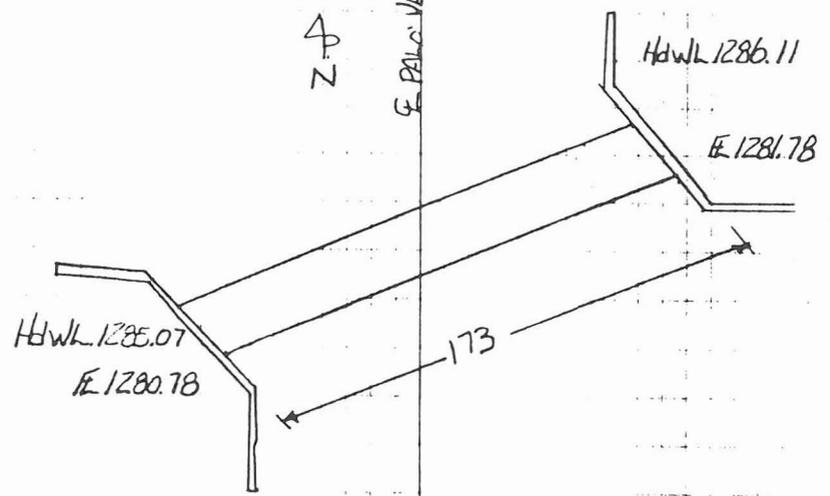


10

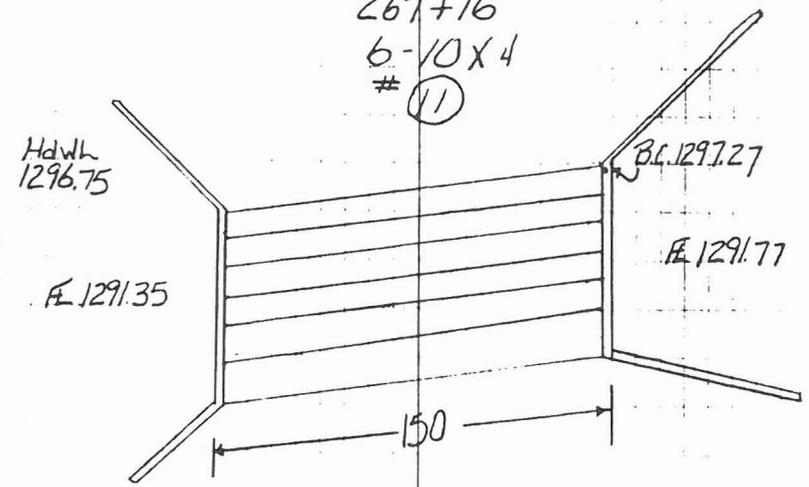
256+50±
1-40" CONC. PIPE

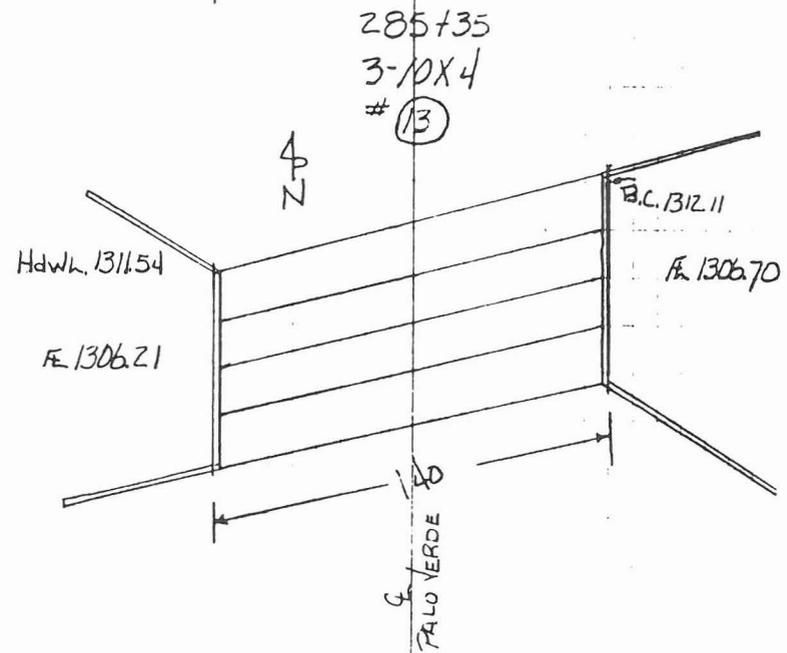
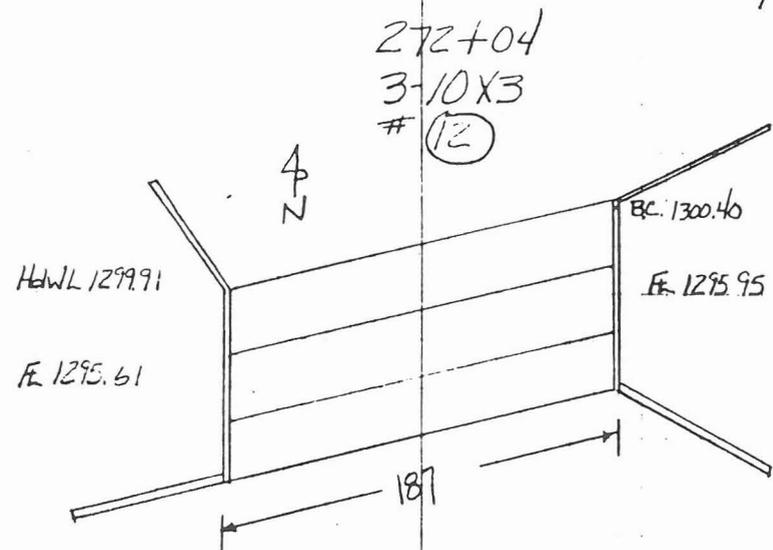
4
N

SE PALO VERDE

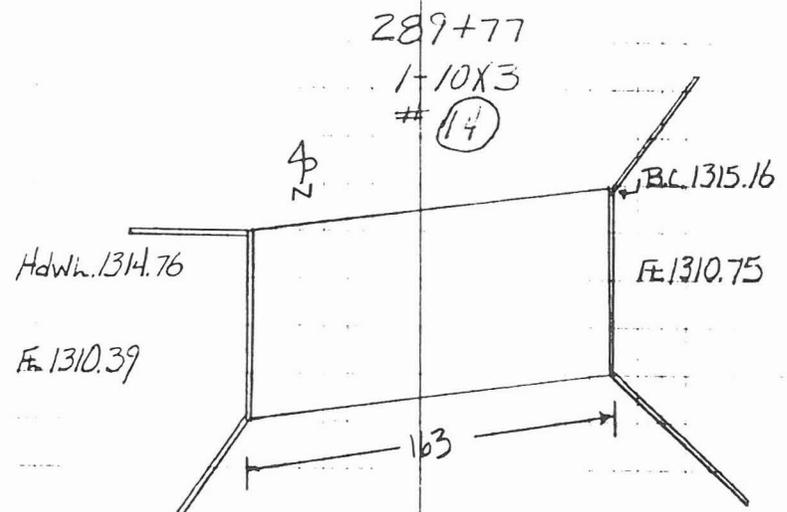


267+16
6-10X4
11

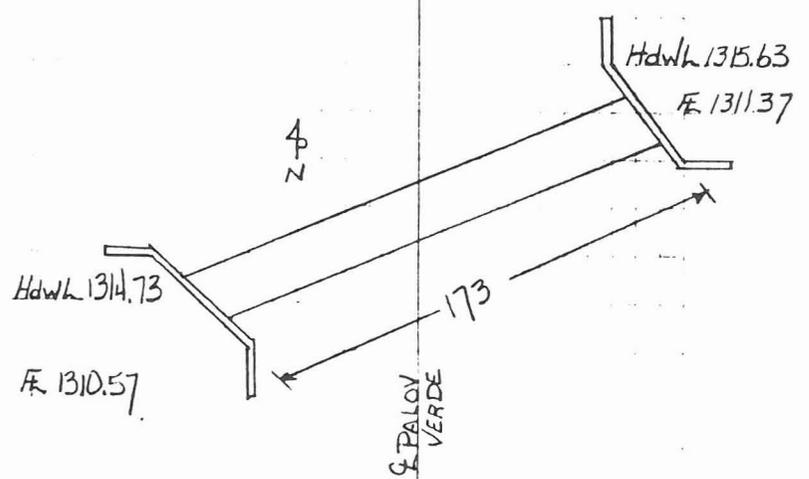




12

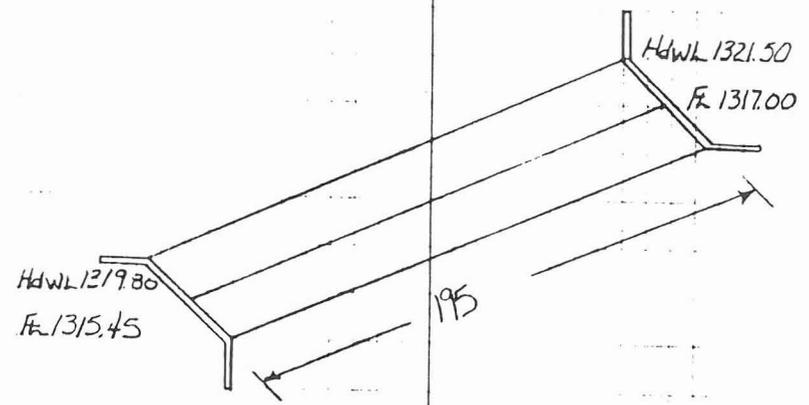


$292+04 \pm$
 1-40" CONC. PIPE

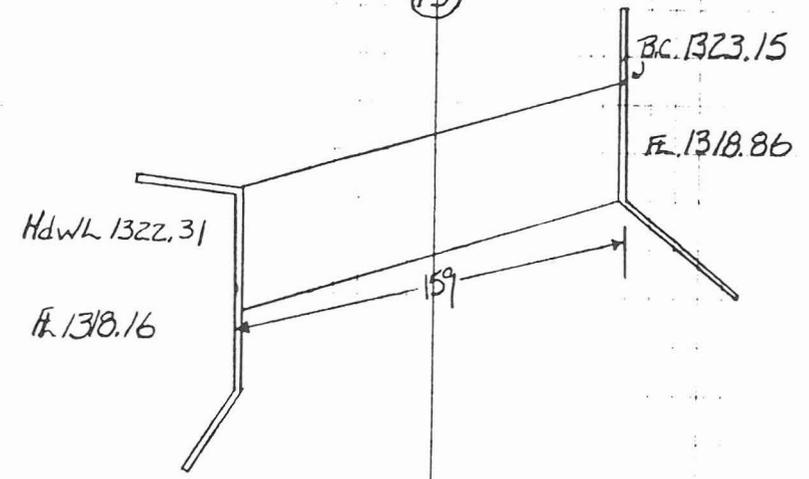


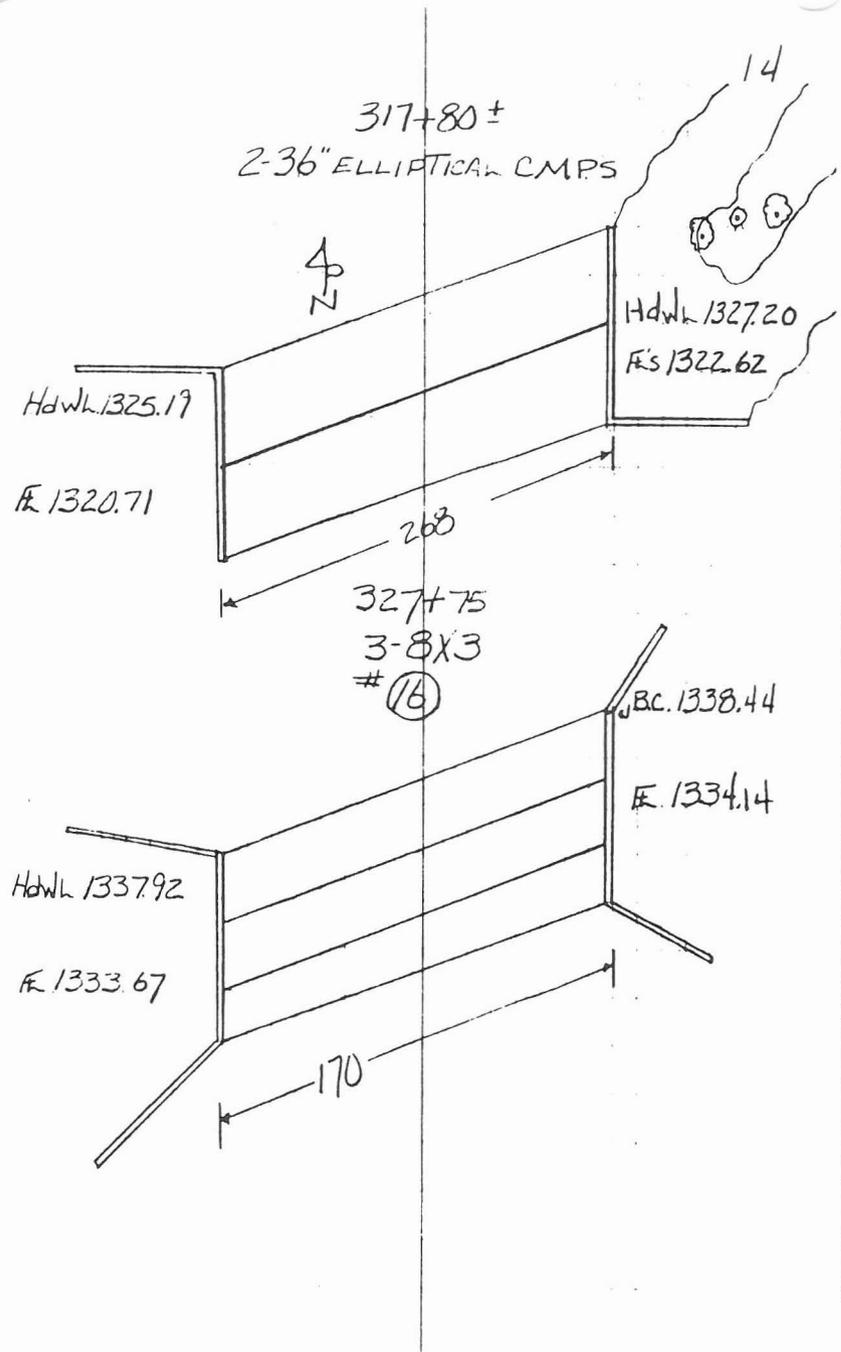
13

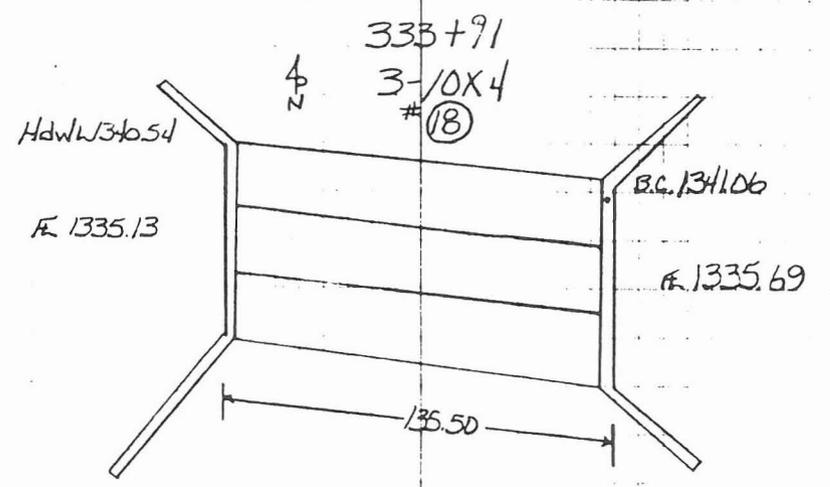
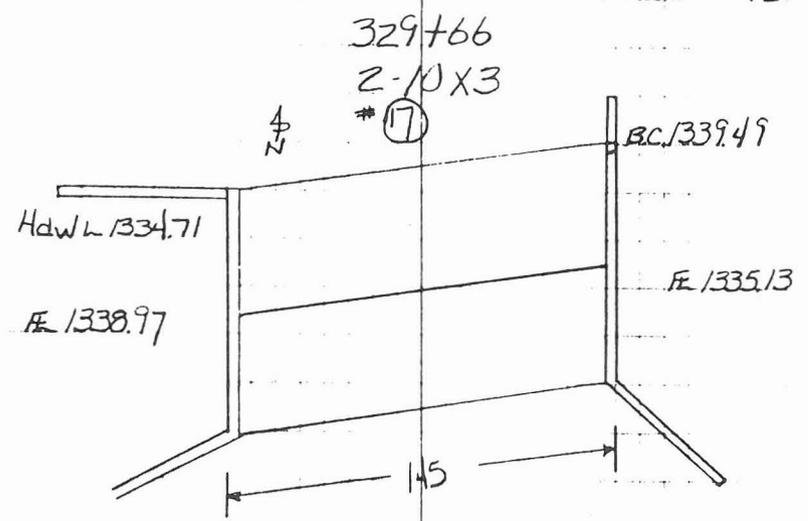
301+00
2-30" CONC. PIPE

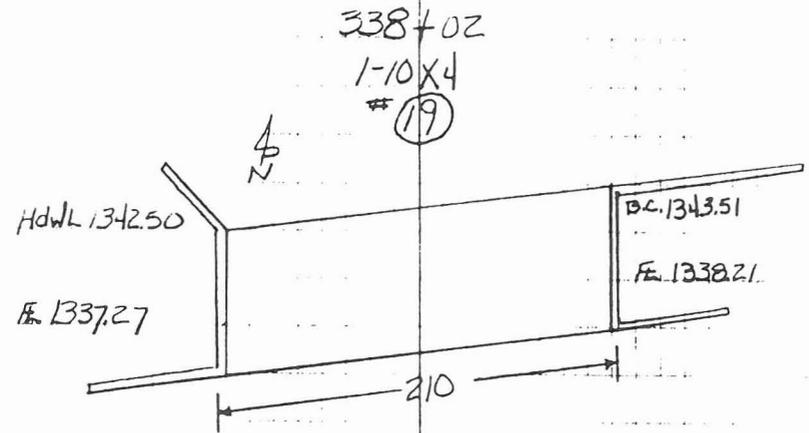


312+62
1-6X3
(15)

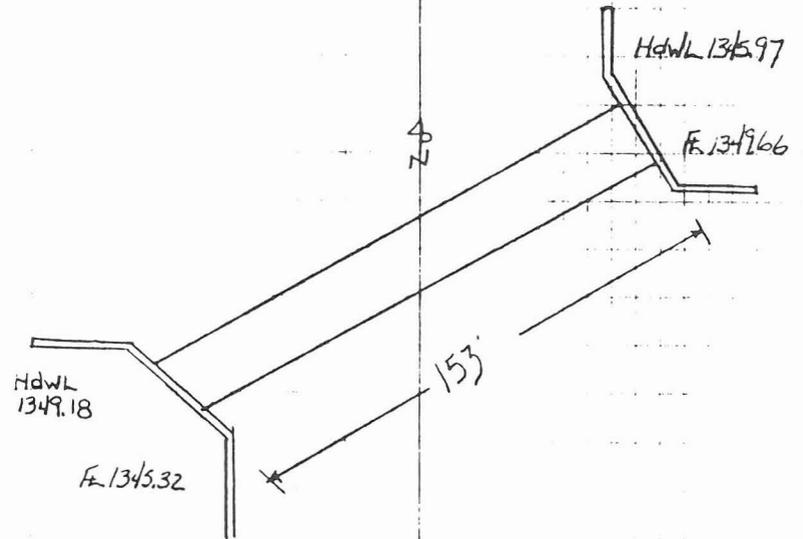


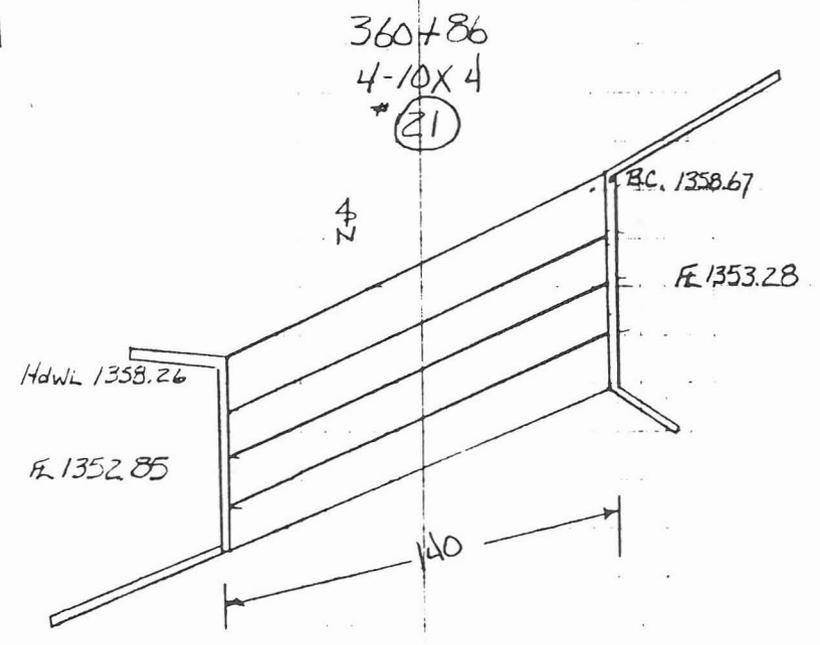
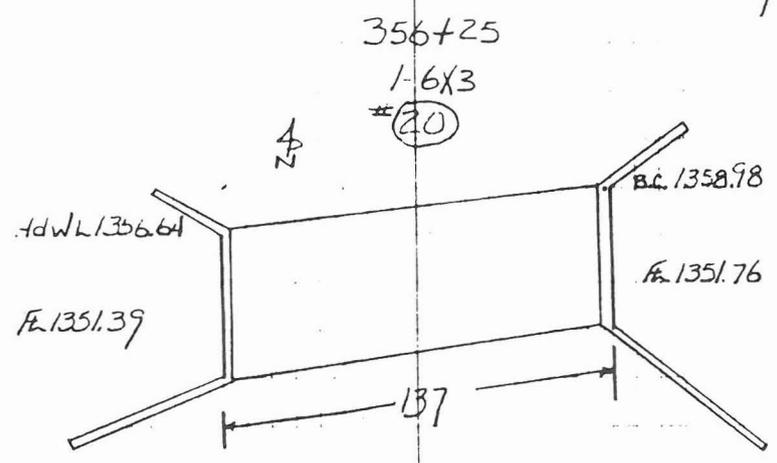


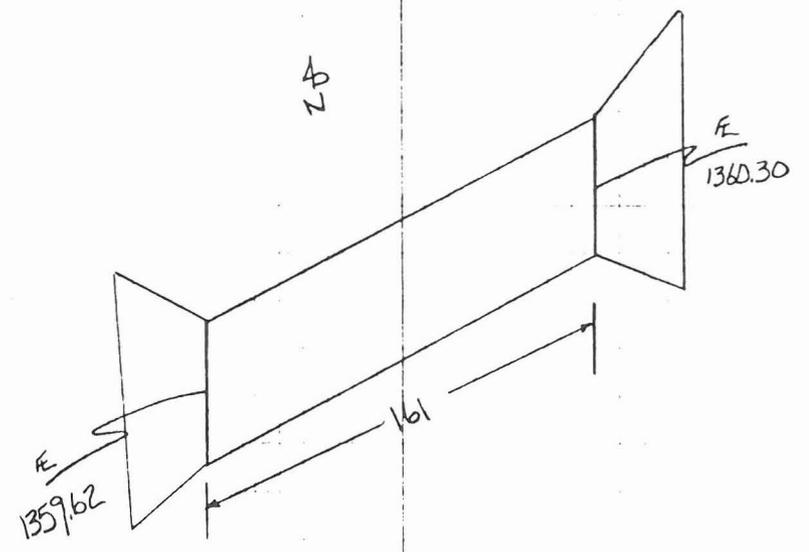
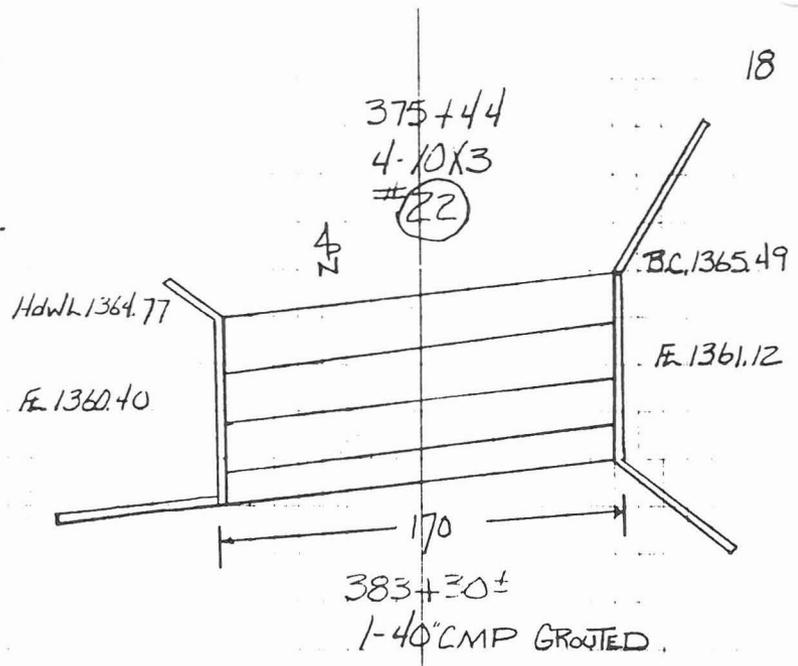




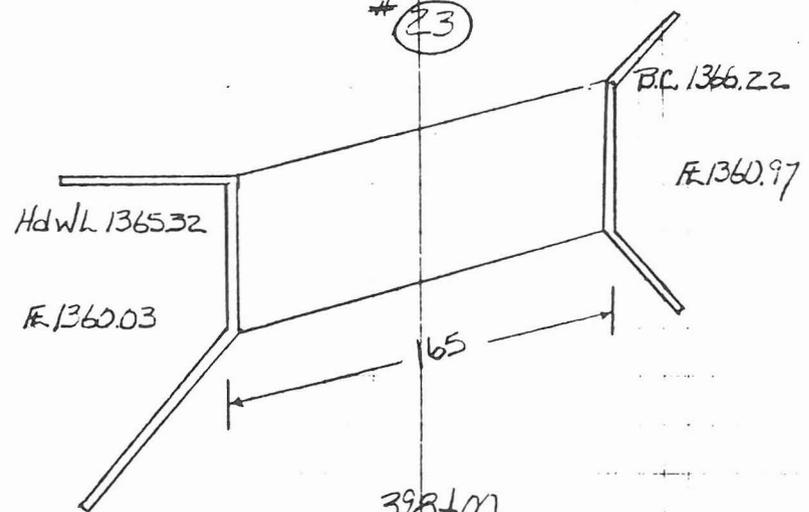
350+80 ±
1-36" CONC. PIPE



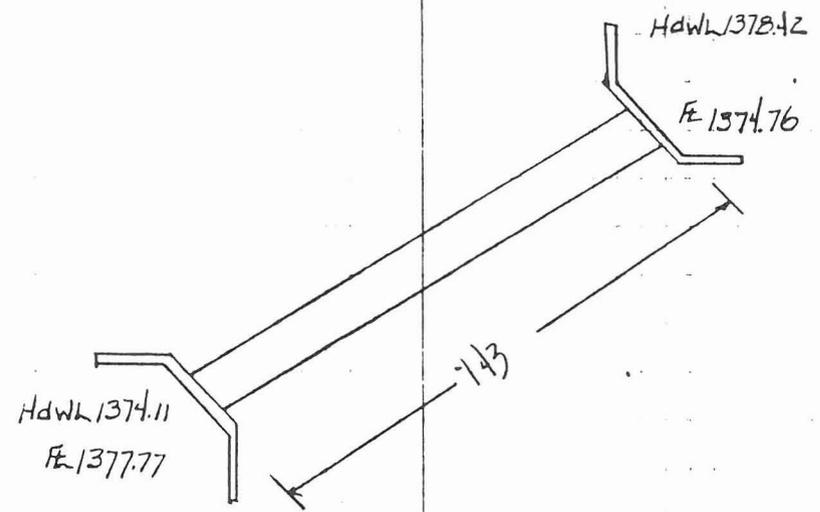


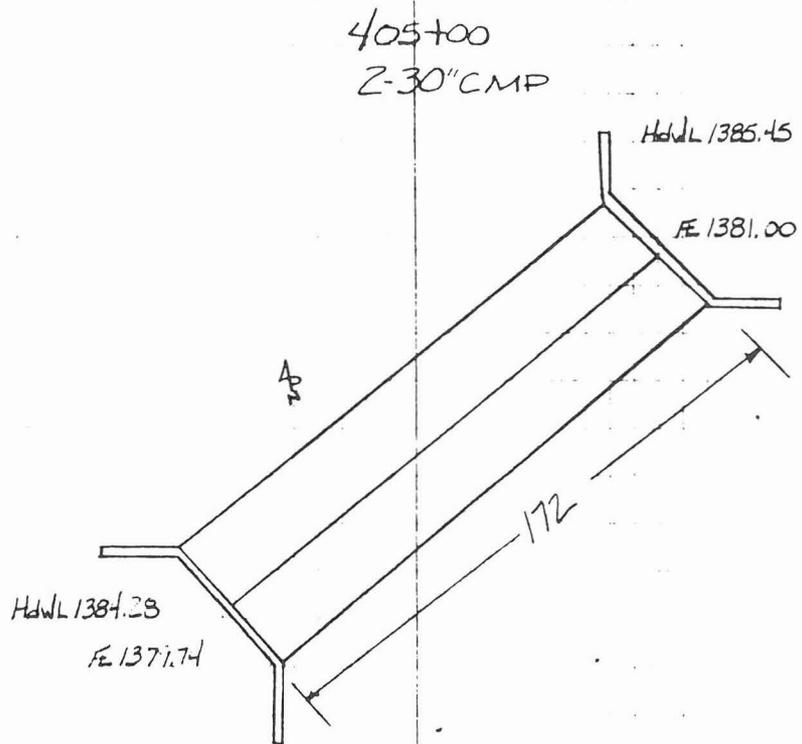
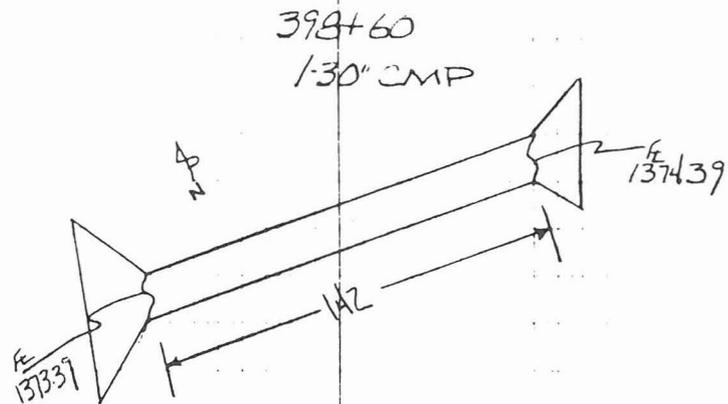


386+60
1-10X4
#23



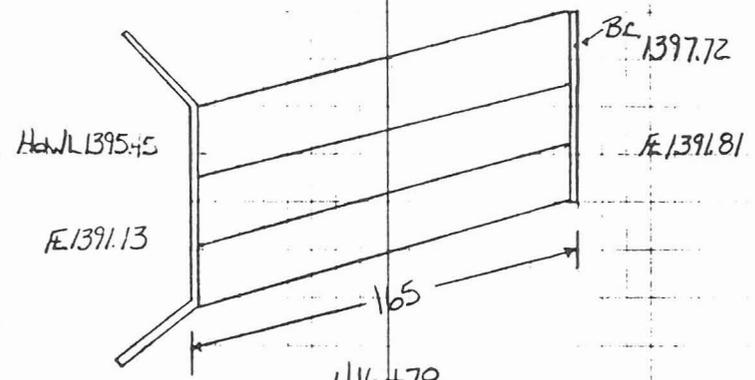
398+00
1-30" CONC. PIPE



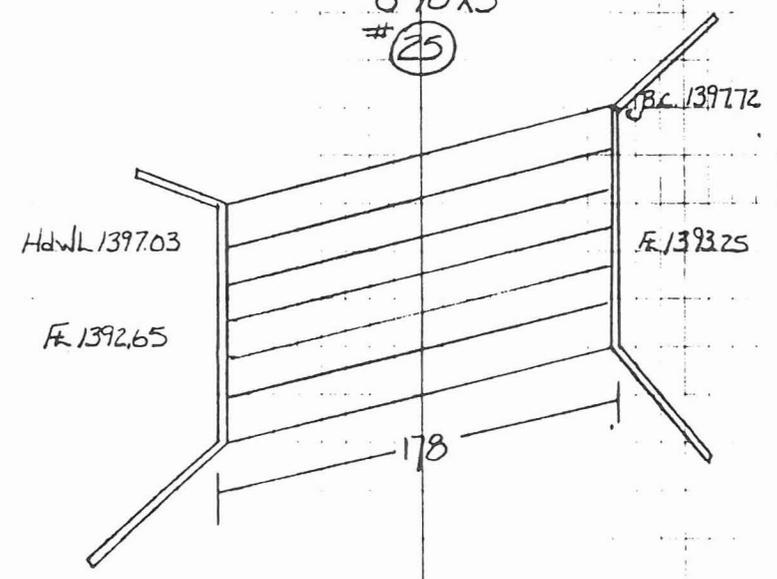


21

413+37
3-10X3
(24)



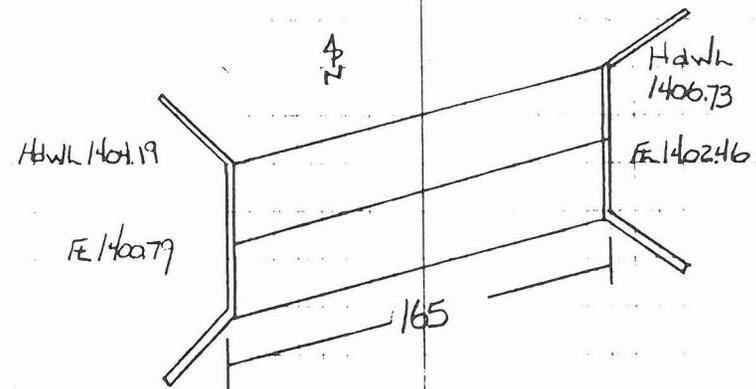
416+78
6-10X3
(25)



425+80

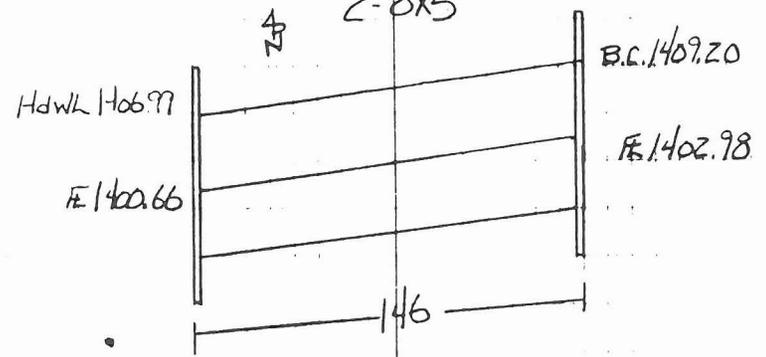
2-36"

ELLIPTICAL CMP'S



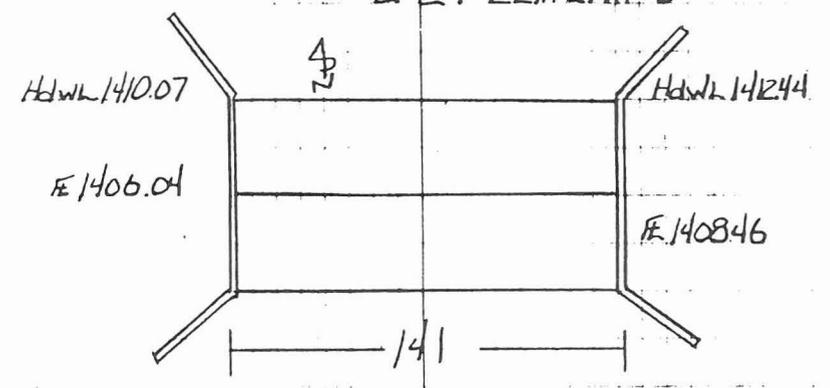
#26 430+91

2-8x5

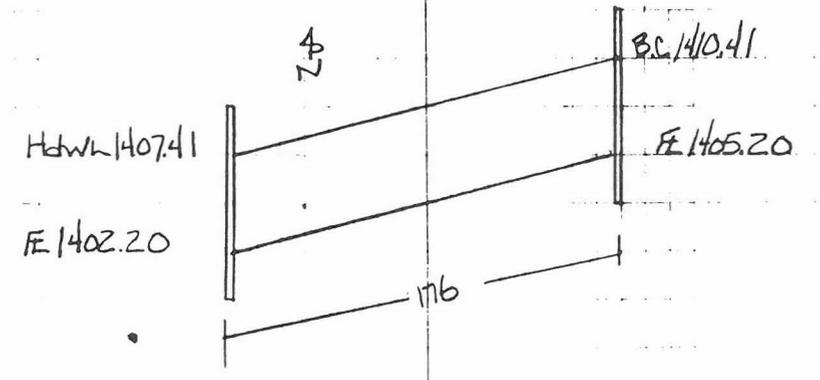


23

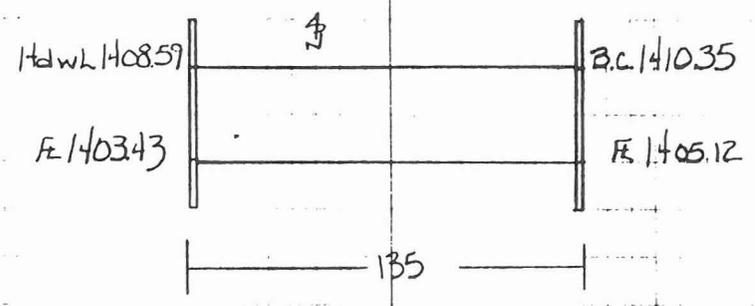
437+25
2-24" ELIP. CMP'S



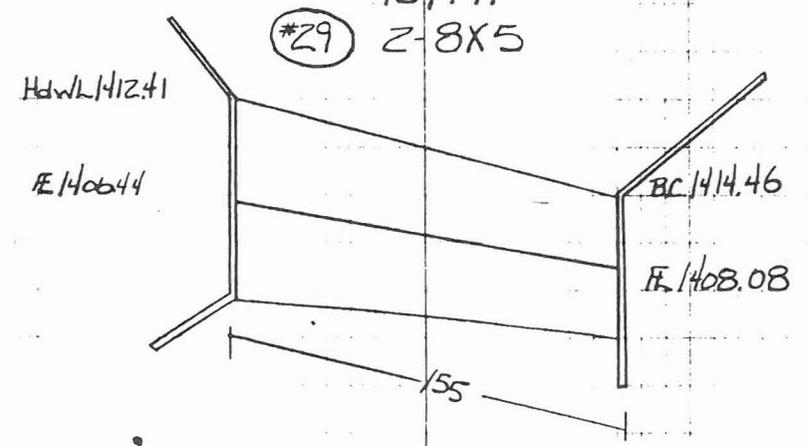
(#27) 443+90
1-8X4



446+28
#28 1-8X4



454+11
#29 2-8X5



TOP S.E. COR. OF SECTION 7 FD. TRANSITTES. / 00-1507
200' SET C.P.S. B.S. PANEL # W006 MCHD B.C. FLUSH
W/PVMT F.S. W007 1/2" REBAR

- 1) 183.42.54
- 2) 7.25.44
- 4) 14.51.26
- (M) 183.42.52

S.E. SEC. OF - W006

ZD 89.51.25

ZR 270.07.54

ZM 87.51.45

S.D 5303.54

H.D. 5303.53

SE SEC. OF 7 - W007

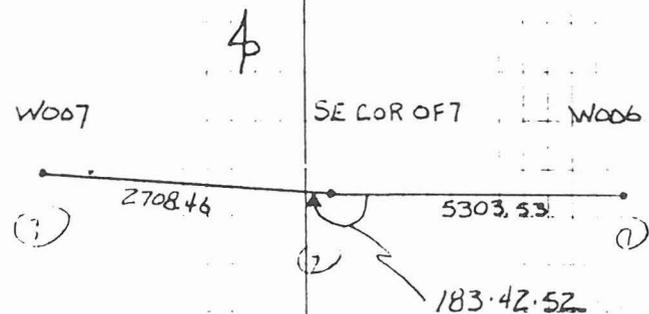
ZD 89.56.15

ZR 270.03.06

ZM 89.56.34

S.D 2708.46

HD 2708.46



TC@ WOOD B.S. SE COR OF SEC. 7 F.S. RANDOM PT.

- 1) 177.10.55
- 2) 354.21.50
- 4) 348.43.44
- M) 177.10.56

TC@ RANDOM PT. B.S. WOOD F.S. WOOD S.E. COR.
OF SECTION 8

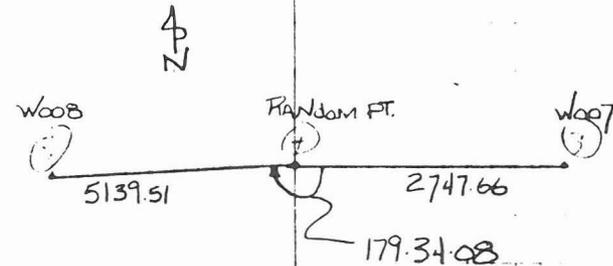
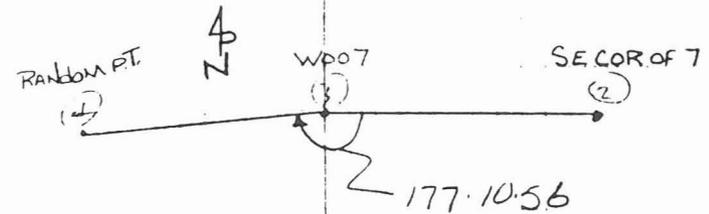
- 1) 179.34.20
- 2) 359.08.15
- 4) 358.16.35
- 6) 357.24.50
- M) 179.34.08

RANDOM - 7

- ZD 89.57.49
- ZR 270.01.11
- ZM 89.58.19
- S.D. 2747.66
- H.O. 2747.66

RANDOM - 8

- ZD 9003.34
- ZR 269.55.33
- ZM 9003.58
- S.D. 5139.51
- H.O. 5139.51



WHITE TANKS WASH

WHITE TANKS WASH



241

241



TRANSIT FIELD BOOK

No. 8152-00

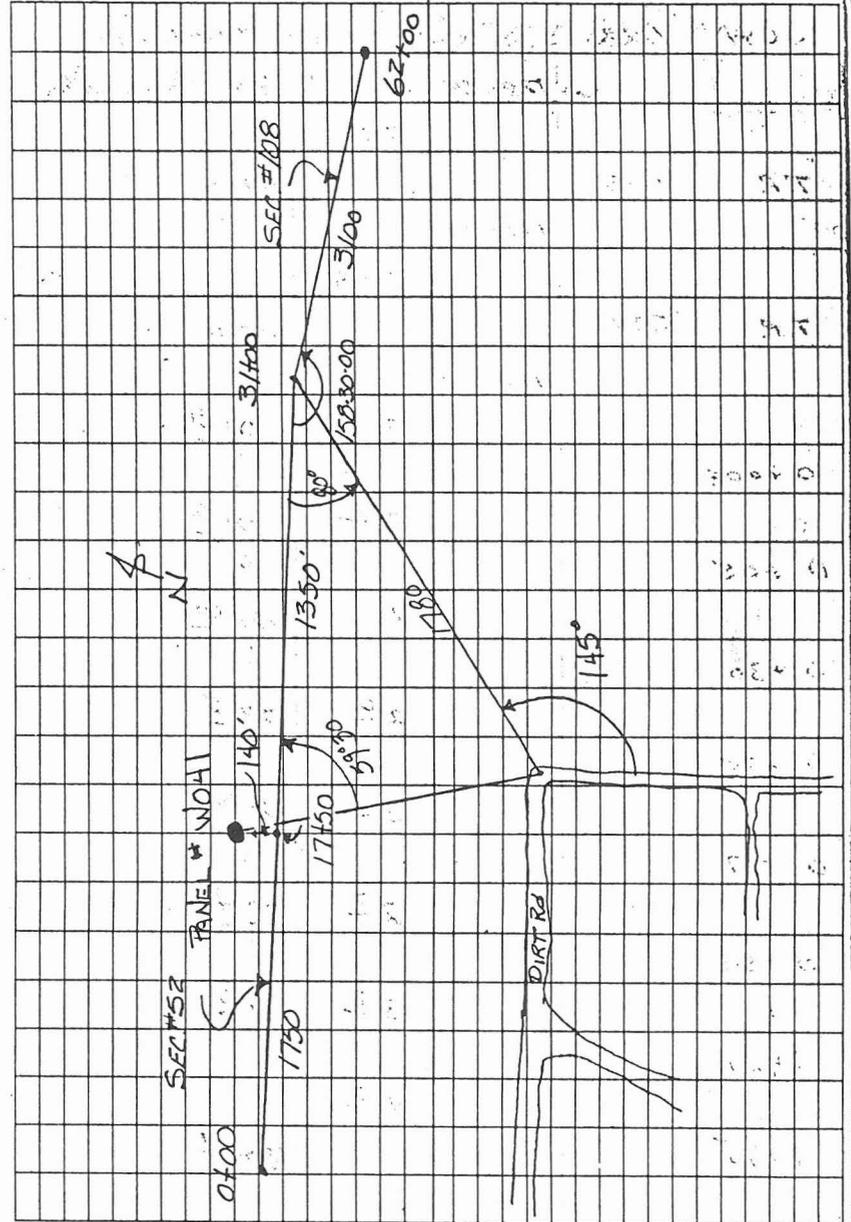
WHITE TANK WASH
X-SECTION CHECK
X-Sec #52 & #108

8-21-92

R L Howell

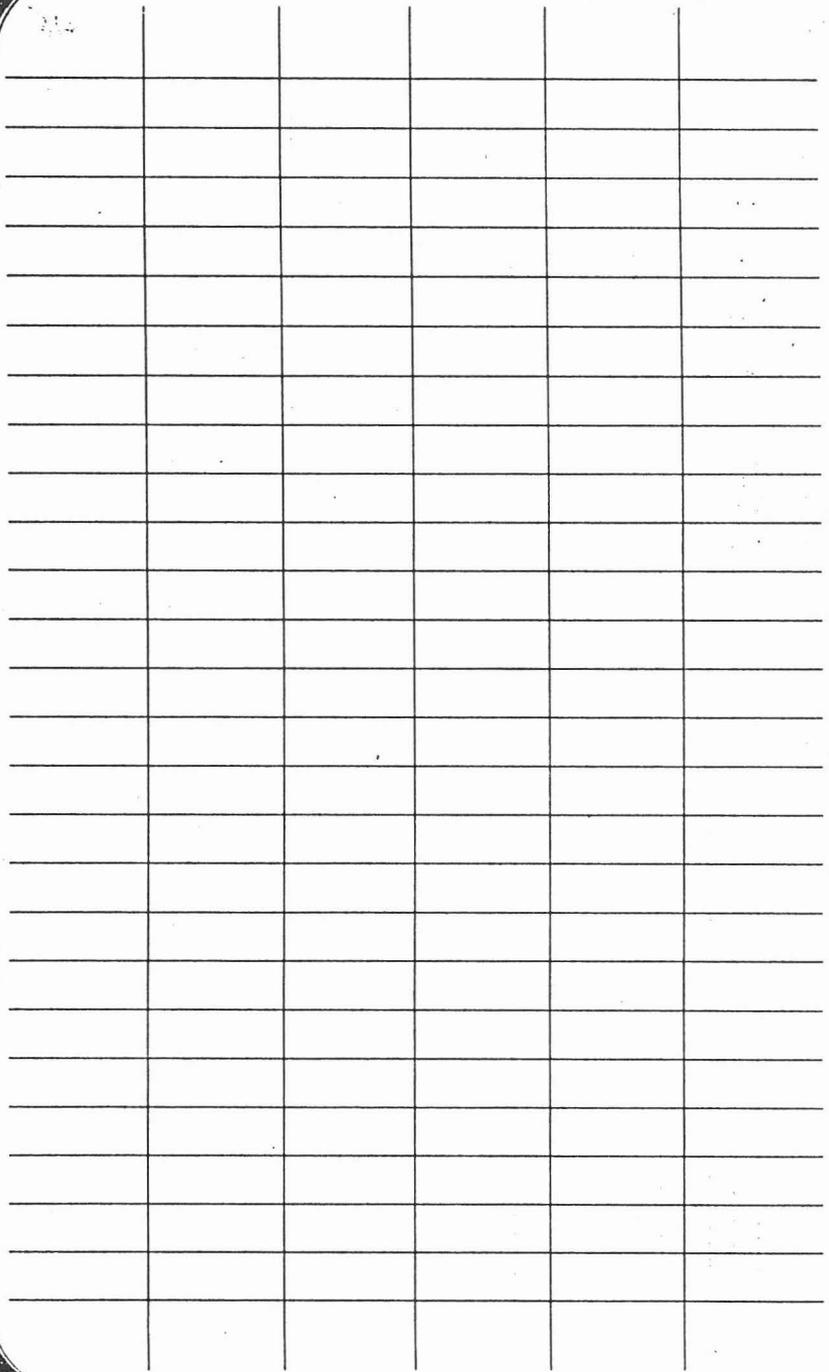
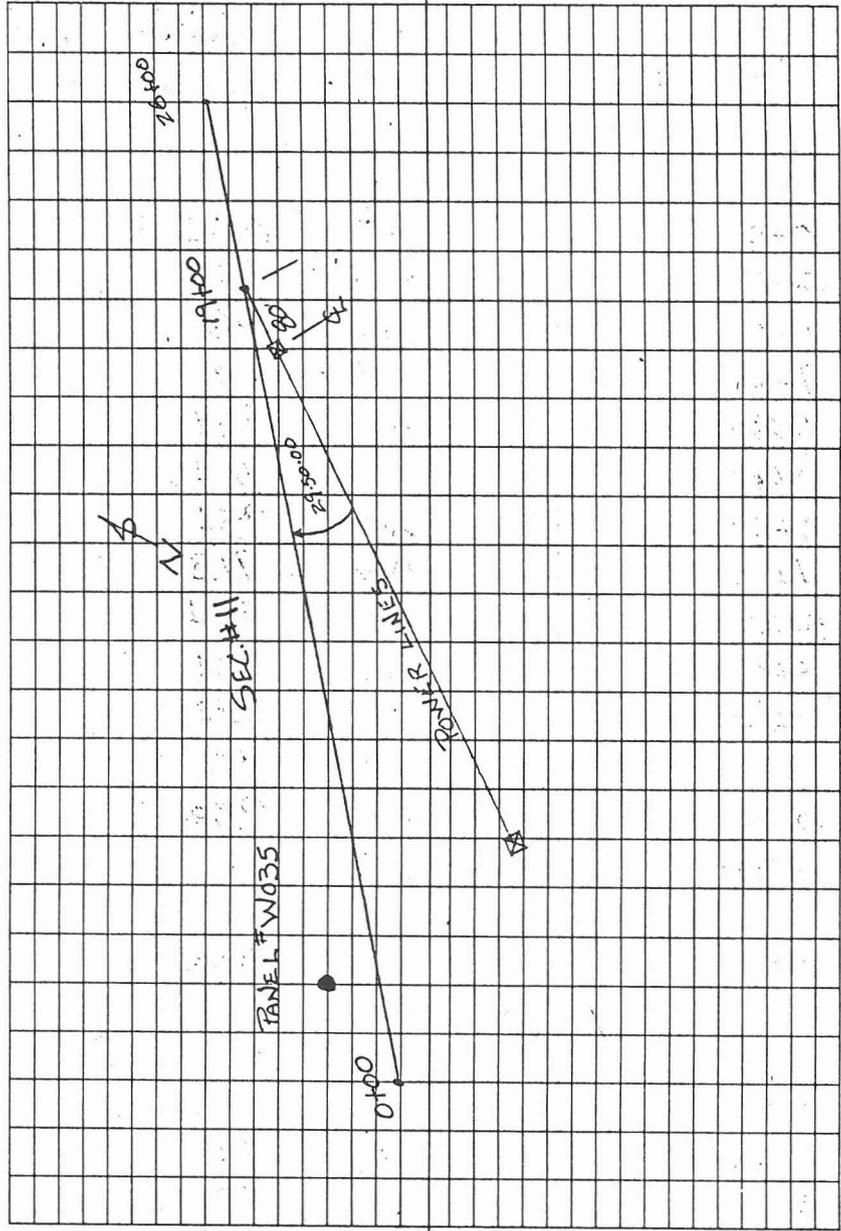
M Holly

L Slover



X-SECTION # 11

8/24/92
M. HOLLY
L. SAOVAR



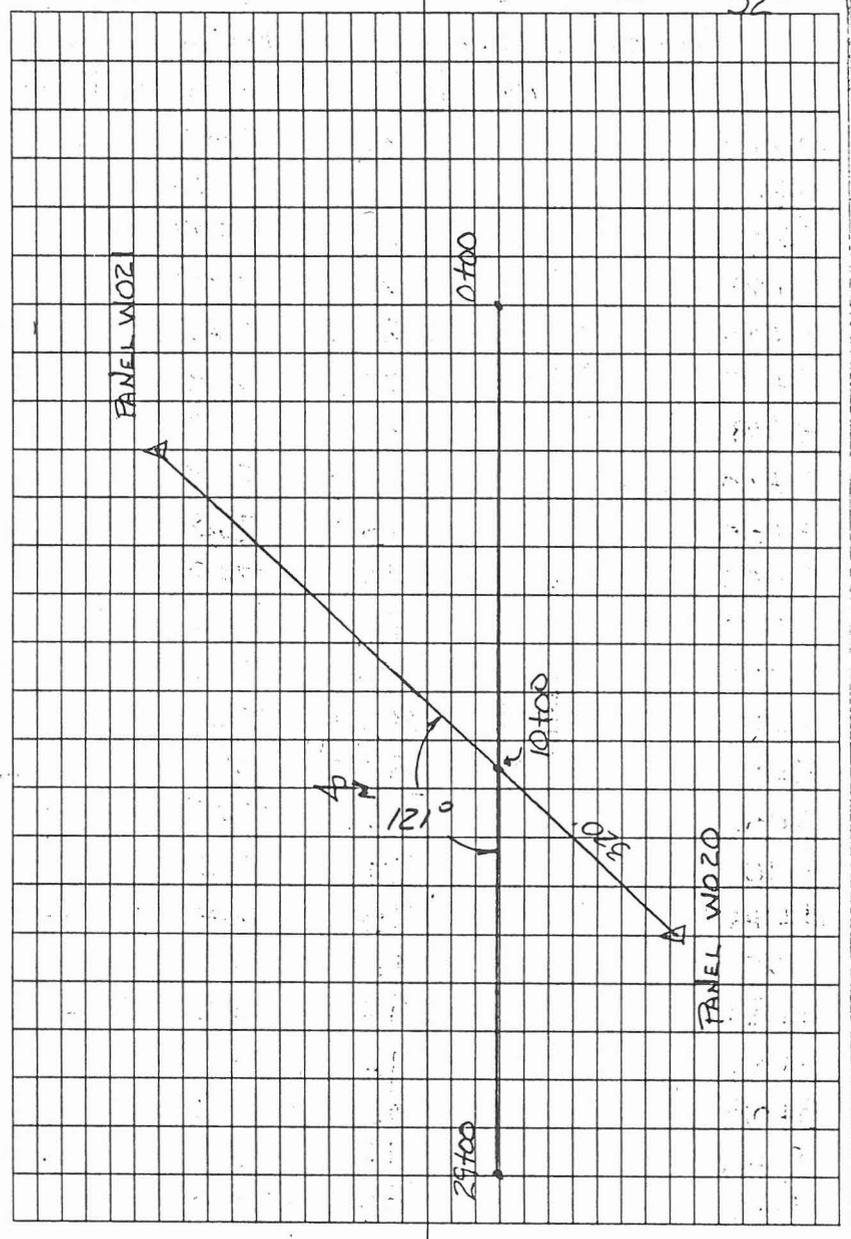
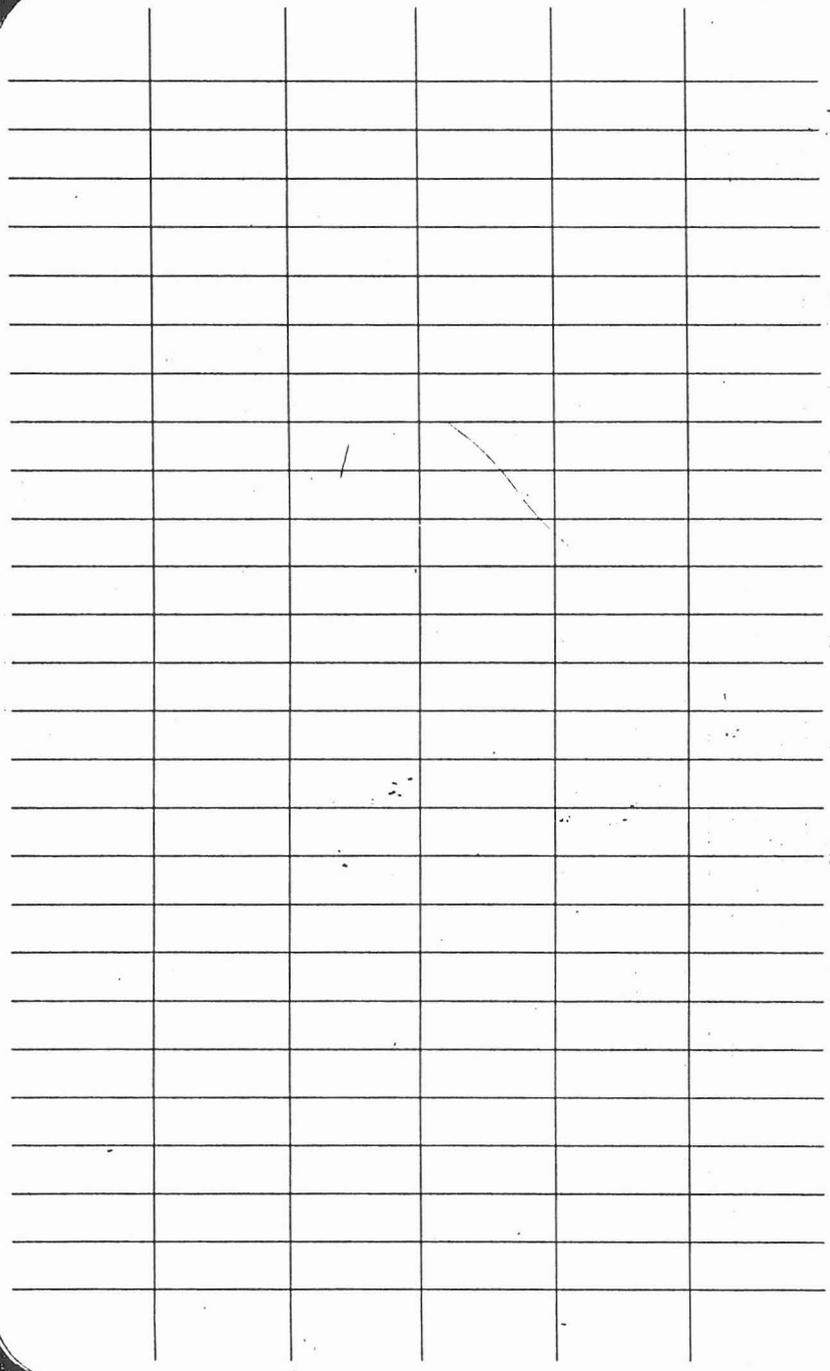
STA	+	HT	-	ELEV	ADJ
				1093.59	
	8.22				
		1101.81			
0+00			4.1	1097.7	—
0+87			5.0	968	—
1+17			6.4	954	—
1+50			5.4	964	—
1+80			6.4	954	—
2+49			5.2	966	—
3+49			6.7	951	—
4+30			10.00	918	—
5+30			8.7	931	—
6+02			6.4	954	—
7+02			7.8	940	—
7+70			9.7	921	—
8+70			8.5	933	—
9+70		1101.81	10.5		—
TP		1101.81	10.50	1091.31	
	10.05	1101.36			
10+70		1101.36	10.3	911	—
11+45			9.9	915	✓
12+45			12.1	893	—

47

DESC			
PANEL #	NO 35 GLO BRASS CAP TAN	ROW	535 536
	0.70 ABOVE GROUND		52 51

X-SECTION # 124

8/24/92
M. H. H. H.
L. SLOVER



STA	+	HT	-	ELEV	ADJ
	10.12			1273.93	
		1284.05			
0+00			6.0	1278.1	✓
0+50			7.1	77.0	✓
1+02			6.2	77.9	—
2+00			6.4	77.7	—
3+00			8.0	76.1	—
3+10			7.7	76.4	—
3+18			8.2	75.9	—
3+30			7.3	76.8	—
3+35			8.3	75.8	—
3+50			7.6	76.5	—
3+67			8.0	76.1	—
3+72			10.6	73.5	—
3+77			8.0	76.1	—
3+91			8.0	76.1	—
3+94			9.4	74.7	—
4+10			7.9	76.3	—
4+75			7.5	76.6	—
4+85			9.4	74.7	—
4+90			9.3	74.8	—
5+00			7.4	76.7	—
5+08			8.2	75.9	—
5+12			7.6	76.5	—
5+18			8.5	75.6	—

DESC:		53
PANEL #	NO. 20	
G.L.O.	BRASS CAP	
SEC. COR.	OF S7/S8	
TRN	RAW	
90	ABOVE GROUND	
		5/8 5/7

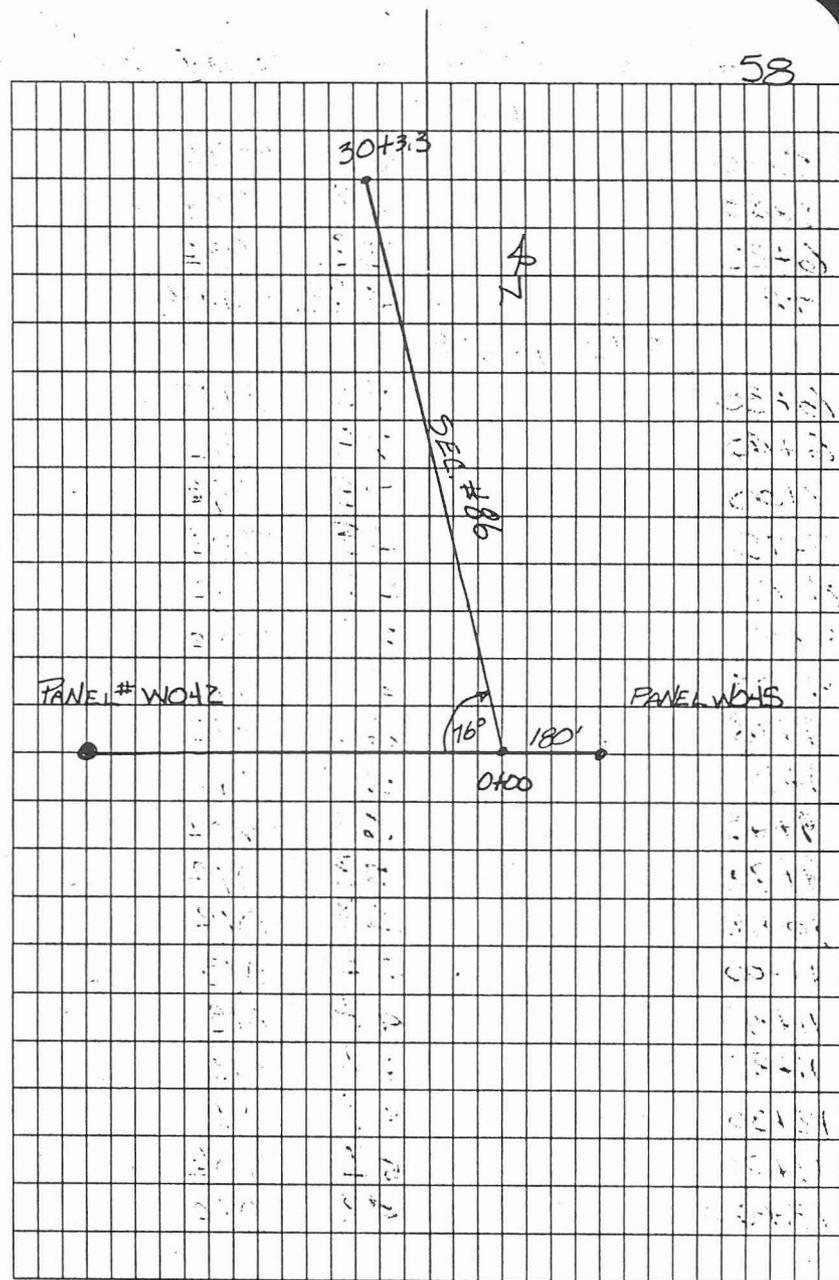
X-SECTION

86

8-26-92
A. Adams
M. Houck
L. Slough

BM: PANCE & W. OAS $\frac{6.5}{7.8}$
Elev of CAP 1301.69

STA	+	H1	-	ELEV	
				130169	
	207	130376			
		↓			
0+00			55	12983	//
0+25			40	998	- /
0+85			50	988	- /
1+33			51	981	- /
2+15			63	975	- /
2+40			72	966	- /
2+43			66	972	- /
2+50			61	971	- /
2+65			70	968	- /
2+85			63	975	- /
3+05			62	970	- /
3+12			71	961	- /
3+17			63	976	- /
3+55			59	971	- /
3+82			58	980	- /
3+87			64	974	- /
4+00			59	971	- /
4+05			69	969	- /
4+10			59	971	- /
4+45			60	978	- /
4+80			52	986	- /



STA	+	HI	-	ELEV	
		1308 ³⁶			
27+60			6 ^B	1301 ⁶	✓
27+70			57	021	✓
27+83			6 ⁰	024	✓
27+86			9 ⁵	1298 ⁹	✓
27+95			9 ⁰	994	✓
28+09			6 ⁵	012	✓
28+25			7 ³	014	✓
28+45			7 ⁵	1300 ⁹	✓
28+67			4 ^B	036	✓
28+80			8 ⁹	1299 ⁵	✓
28+90			7 ⁶	1300 ⁸	✓
29+50			3 ¹	05 ³	✓
30+33			04	1308 ⁰	✓
TP			7 ⁹¹	1300 ⁴⁵	
	54 ^B	1305 ⁹³			
TP			747	1298 ⁴⁶	
	44 ⁷	1302 ⁹³			
			124	1301 ⁶⁹	

62

BM E: 0⁰⁰

SUN VALLEY PARKWAY DATA

- **BENCHMARK INFORMATION**
- **AS-BUILT DRAINAGE TABULATION**
- **AERIAL PROFILE OF WEST DITCH**
- **AERIAL PROFILE OF ROAD CENTERLINE**

WHITE TANKS WASH FLOOD INSURANCE STUDY for FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
 BENCH MARK INFORMATION FROM SUN VALLEY PARKWAY
 ALPHA ENGINEERING GROUP INC, 2929 E CAMELBACK RD, PHOENIX AZ 85016

INFORMATION BELOW IS FROM SUN VALLEY PARKWAY DRAWINGS
 DATA SHOULD BE CONSIDERED APPROXIMATE UNTIL FIELD CHECKED.

printed 11/02/93
 updated 11/23/92
 F:\WT\WTW-P-BM.WQ1

STAT	OFFSET	ELEV	#-SxR	DESCRIPTION
Phase 3				
1504	L100	1078.85		ADOT ROW BC @ BOP & 40' N of begin Conc Chan
3815	R93	1099.96	3-10x3	BC SE cor CBC headwall SE Van Buren intersec
13040	R67	1185.64	3-10x3	"x" in top of conc headwall CBC north end
13784	R67	1191.79	3-10x3	"x" in top of conc headwall CBC north end
16235	R67 ??		6-10x3	"x" in top of conc headwall CBC north end
17358	R67 ??		2-8x3	"x" in top of conc headwall CBC north end
19665	R67	1239.28	6-10x4	BC in top of conc headwall CBC north end
19941	R67	1240.67	4-10x3	BC in top of conc headwall CBC north end
22592	R67	1266.92	3-10x3	BC in top of conc headwall CBC north end
22837	R67	1269.28	2-10x3	BC in top of conc headwall CBC north end
23097	R67	1270.37	2-10x3	BC in top of conc headwall CBC north end
24434	R67	1280.71	1-10x3	BC in top of conc headwall CBC north end
26716	R67	1299.08	6-10x4	BC in top of conc headwall CBC north end
27204	R67 ??		3-10x3	BC in top of conc headwall CBC north end
28535	R67	1313.88	4-10x4	BC in top of conc headwall CBC north end
28977	R67	1316.92	1-10x3	BC in top of conc headwall CBC north end
31262	R67	1324.88	1-6x3	BC in top of conc headwall CBC north end
32775	R67	1340.13	3-8x3	BC in top of conc headwall CBC north end
32966	R67	1341.16	2-10x3	BC in top of conc headwall CBC north end
33391	R67	1342.77	3-10x4	BC in top of conc headwall CBC north end
33802	R67	1345.23	1-10x4	BC in top of conc headwall CBC north end
35625	R67	1357.67	1-6x3	BC in top of conc headwall CBC north end
36086	R67 ??	1360.57	4-10x4	BC in top of conc headwall CBC north end
37544	R67	1367.20	4-10x3	BC in top of conc headwall CBC north end
38660	R67 ??	1366.94	1-10x4	BC in top of conc headwall CBC north end
Phase 2				
41337	R67	1397.85	3-10x3	BC in top of conc headwall CBC north end
41678	R67	1399.39	6-10x3	BC in top of conc headwall CBC north end
43091	R71	1410.86	2-8x5	BC in top of conc headwall CBC north end
44390	R67	1412.09	1-8x4	BC in top of conc headwall CBC north end
44628	R67	1412.03	1-8x4	BC in top of conc headwall CBC north end
45411	R67	1416.10	2-8x5	BC in top of conc headwall CBC north end
46049	R68	1418.17	1-6x5	BC in top of conc headwall CBC north end
47350	R67	1417.19	1-8x3	BC in top of conc headwall CBC north end
47704	R67	1417.08	1-6x3	BC in top of conc headwall CBC north end
48043	R67	1417.79	6-10x5	BC in top of conc headwall CBC north end
48143	R67	1417.85	6-10x5	BC in top of conc headwall CBC north end
48304	R67	1417.98	3-12x5	BC in top of conc headwall CBC north end
49285	R67	1416.78	1-10x3	BC in top of conc headwall CBC north end

TABULATION OF ROADWAY CULVERTS & RT DITCH FROM SUN VALLEY PKWAY AS BUILTS
 FOR: THE FLOOD CONTROL DISTRICT OF MARICOPA COUNTY, ARIZONA
 BY: ALPHA ENGINEERING GROUP, INC., 2929 E. CAMELBACK RD., #215, PHOENIX AZ 85016

Printed 02-Nov-93
 Updated 04 Feb 92
 F:\WT\CHANTAB.WQ1

ITEM	RIGHT SIDE OF ROAD			LEFT SIDE OF ROAD			CULVERT					CHANNEL			COMMENT
	STA	INV	OFFSE	STA	INV	OFFS	#	SP	RISE	LGT	SLOPE	SKE	W	SLOPE	
End Chan	1115	1075.00	130.0										20	0.0040	E 1/4 S8 T1N R4W
Reference	1308		0										20	0.0040	
BOP Chan	1504	1076.47	71.0										20	0.0080	
RCP	1828	1079.05	61.0	1903	1079.77	47.7	1	1	1	129	-0.0056	34.7	20	0.0080	
RCP	2378	1083.46	61.0	2451	1084.17	47.7	1	1	1	133	-0.0056	34.0	20	0.0092	
Chan Tran	2600	1085.24	70.0										18	0.0092	50' length
RCP	2900	1088.00	61.0	2976	1088.82	47.7	1	1	1	134	-0.0064	35.0	18	0.0092	
RCP	3350	1092.14	61.0	3428	1092.96	47.7	1	1	1	133	-0.0063	35.5	18	0.0092	
Chan Tran	3685	1095.20	70.0										32	0.0042	129.5' trans
CBC Chan	3813	1095.58	77.5				3	10	3	135	0.0080	90.0	30	0.0080	
Chan Tran	3948	1096.66	77.5										32	0.0180	
Chan	4060	1098.69	68.0										14	0.0092	
RCP	4254	1100.48	61.0	4325	1101.22	47.7	1	1	1	131	-0.0060	33.0	14	0.0092	
RCP	4678	1104.38	61.0	4752	1105.15	47.7	1	1	1	133	-0.0060	34.3	14	0.0092	
Chan Tran	4930	1106.68	68.0										10	0.0092	
Chan	5000	1107.52	66.0										10	0.0092	70' trans
RCP	5172	1108.91	61.0	5250	1110.35	47.7	1	1	1	132	-0.0110	35.7	10	0.0092	
RCP	5576	1112.61	61.0	5650	1114.03	47.7	1	1	1	130	-0.0109	34.2	10	0.0092	
RCP	6075	1117.24	61.0	6150	1118.63	47.7	1	1	1	130	-0.0107	34.6	10	0.0092	
Grade Brk	6347	1119.71	66.0										10	0.0122	
Grade Brk	6479	1121.32	66.0										10	0.0080	
Grade Brk	6617	1122.45	66.0										10	0.0050	
Grade Brk	6749	1123.11	66.0										10	0.0080	
RCP	6935	1124.61	61.0	7015	1125.86	47.7	1	1	1	134	-0.0090	36.4	10	0.0092	
RCP	7325	1127.72	62.0	7400	1129.03	47.7	1	1	1	130	-0.0101	34.4	10	0.0092	
Grade Brk	7500	1129.12	66.0										10	0.0092	
RCP	7825	1132.11	62.0	7900	1133.43	47.7	1	1	1	130	-0.0102	34.4	10	0.0092	
RCP	8225	1135.80	61.0	8301	1136.63	47.71	1	1	1	130	-0.0064	35.0	10	0.0092	
RCP	8725	1140.40	61.0	8800	1141.23	47.71	1	1	1	130	-0.0064	34.6	10	0.0092	
Chan Tran	9112	1143.65	66.0										18	0.0055	100' Trans
CBC Chan	9212	1144.10	70.0				2	8	3	137	0.0139	90.0	16	0.0159	
Chan Tran	9349	1146.02	70.0										18	0.0096	100' Trans
Chan	9449	1147.06	70.0										8	0.0096	
RCP	9650	1148.88	66.0	9675	1149.40	0	1	1	1	71	-0.0073	20.7	8	0.0096	
Grade Brk	10600	1158.11	70.0										8	0.0048	
Drop	11170	1160.80	69.4		1161.26								8	0.0070	
Drop	11625	1164.44	71.5		1165.44								6	0.0076	
Drop	11900	1167.54	68.2		1168.04								6	0.0080	
RCP	11910	1168.20	65.0	11950	1168.50	0	1	1	1	76	-0.0040	31.6	6	0.0080	
Drop	12100	1169.65	70.0		1170.60								6	0.0100	
Drop	12225	1171.85	69.4		1172.85								4	0.0100	
Drop	12381	1174.41	68.4		1175.41								4	0.0100	
Drop	12588	1177.47	68.4		1178.47								4	0.0100	
Drop-Tran	12694	1179.54	67.3		1180.54								4	0.0056	30' trans beg V ditch
Chan	12724	1180.60	61.9										0	0.0056	
CBC #1	13015	1181.15	67.0	12896	1180.36	67	3	10	3	178	0.0044	-41.3	0	0.0075	
Ditch End	13650	1187.80	65.9										0	0.5000	end V ditch beg V ditch
CBC #2	13758	1187.39	67.0	13621	1186.24	67	3	10	3	196	0.0060	-46.0	0	0.0098	
Ditch End	14032	1191.20	65.6										0	0.5000	end V ditch
RCP 2A	14308	1191.50	68.0	14190	1190.42	68	1	4	4	180	0.0060	-41.0	6	0.0040	
RCP 2B	14850	1195.51	63.0	14900	1196.47	0	1	1	1	80	-0.0120	38.0	6	0.0060	
Chan Tran	15125	1197.10	65.0										10	0.0100	
Grade Brk	15285	1198.80	68.4										10	0.0136	
Ditch End	15725	1204.80	68.4										0	0.2500	
CBC #3	16196	1207.59	67.0	16138	1207.05	67	6	10	3	146	0.0037	-23.0	15	0.0055	
Chan Tran	16375	1209.60	71.8										8	0.0092	

TABULATION OF ROADWAY CULVERTS & RT DITCH FROM SUN VALLEY PKWAY AS BUILTS
 FOR: THE FLOOD CONTROL DISTRICT OF MARICOPA COUNTY, ARIZONA
 BY: ALPHA ENGINEERING GROUP, INC., 2929 E. CAMELBACK RD., #215, PHOENIX AZ 85016

Printed 02-Nov-93
 Updated 04 Feb 92
 F:\WT\CHANTAB.WQ1

ITEM	RIGHT SIDE OF ROAD			LEFT SIDE OF ROAD			CULVERT					CHANNEL			COMMENT
	STA	INV	OFFSE	STA	INV	OFFS	#	SP	RISE	LGT	SLOPE	SKE	W	SLOPE	
Chan Tran	16625	1211.90	68.4										8	0.0124	beg V ditch
Chan Tran	16675	1212.90	62.0										0	0.0124	beg V ditch
Ditch End	17108	1219.00	56.0										0	-0.1000	end V ditch
RCP 3A	17162	1215.60	71.1	17070	1214.92	80.6	1	3	3	177	0.0039	-31.0			
CBC #4	17346	1216.15	67.0	17238	1215.53	68.6	2	8	3	173	0.0036	-39.0			
Egn Ditch	17882	1223.30	67.0										4	0.0040	
Grade Brk	18425	1225.80	62.8										4	0.0056	
Chan Tran	18550	1226.50	62.8										4	0.0120	beg V ditch
Chan Tran	18600	1227.10	62.4										0	0.0120	beg V ditch
Grade Brk	19000	1251.90	62.4										0	0.0137	
Grade Brk	19175	1254.30	62.4										0	0.0091	
Grade Brk	19394	1236.30	64.0										0	0.0106	
Grade Brk	19460	1237.00	75.5										0		
CBC #5	19526	1233.92	67.0	19494	1233.42	67	6	10	4	138	0.0034	-13.5	4	0.0185	
Ditch End	19726	1238.00	68.0										4	-0.0077	
CBC #6	19902	1236.30	67.0	19689	1235.45	67	4	10	3	252	0.0034	-57.8	5	0.0657	
Grade Brk	20000	1238.90	72.6										5	0.0100	
Grade Brk	20400	1242.90	66.1										5	0.0160	
Grade Brk	20450	1243.70	65.7										5	0.0108	
Grade Brk	21000	1249.30	65.7										5	0.0068	
Chan Tran	21700	1254.30	65.7										5	0.0132	
Grade Brk	21750	1255.00	65.8										2	0.0060	
Chan Tran	21900	1256.90	65.8										0	0.0060	beg V ditch
Grade Brk	22000	1257.80	65.8										0	0.0100	
Grade Brk	22175	1259.20	68.2										0	0.0132	
Grade Brk	22451	1262.80	67.1										0	0.0267	
Ditch End	22540	1265.10	70.0										0	-0.1000	
CBC #7	22572	1262.54	67.0	22465	1261.86	67	3	10	3	171	0.0040	-38.5	15	0.0096	
Grade Brk	22596	1262.6	83										15	0.0168	
Chan Tran	22690	1265.6	71.7										15	0.0168	
Grade Brk	22712	1265.9	63.8										0	0.0168	
Grade Brk	22788	1267.2	71										0		
CBC #8	22825	1264.87	67	22746	1264.33	67	2	10	3	155	0.0036	-30	15	0.0096	
Grade Brk	22838	1264.9	85										15	0.0096	
Grade Brk	22936	1267.20	72.0										15	0.0075	gr?
Chan Tran	22970	1267.60	71.0										0	0.0075	
CBC #9	23083	1266.12	67.0	22971	1265.70	67	2	10	3	175	0.0024	-40.0	4	0.0425	
Grade Brk	23150	1268.50	70.0										4	0.0043	
Grade Brk	23196	1268.70	65.0										4	0.0043	
Chan Tran	23500	1270.00	64.8										4	0.0103	
Chan Tran	23550	1270.50	62.4										0	0.0103	beg V ditch
Grade Brk	24365	1278.70	61.6										0	0.0577	
CBC #10	24426	1276.42	67.0	24323	1275.94	67	1	10	3	169	0.0028	-38.0	4	0.0344	
Grade Brk	24475	1277.90	67.6										4	0.0040	
Chan Tran	24750	1279.00	67.5										4	0.0240	
Grade Brk	24625	1280.80	60.5										0	0.0109	
Grade Brk	25000	1282.70	60.5										0	0.0120	
Grade Brk	25150	1284.50	60.8										0	0.0040	
Grade Brk	25200	1284.70	62.0										0	0.0044	gr?
Grade Brk	25400	1286.30	63.0										0	0.0807	
Grade Brk	25425	1288.32	64.0										0	-0.2200	
RCP 10A	25446	1283.64	68.0	25341	1282.67	68	1	4	4	172	0.0057	-38.0	4	0.0693	
Grade Brk	25487	1286.50	68.0										4	0.0045	
Grade Brk	25890	1286.30	66.0										4	0.0183	
Grade Brk	25950	1289.40	64.0										4	0.0130	
Grade Brk	26000	1290.00	64.0										4	0.0137	

TABULATION OF ROADWAY CULVERTS & RT DITCH FROM SUN VALLEY PKWAY AS BUILTS
 FOR: THE FLOOD CONTROL DISTRICT OF MARICOPA COUNTY, ARIZONA
 BY: ALPHA ENGINEERING GROUP, INC., 2929 E. CAMELBACK RD., #215, PHOENIX AZ 85016

Printed 02-Nov-93
 Updated 04 Feb 92
 F:\WT\CHANTAB.WQ1

ITEM	RIGHT SIDE OF ROAD			LEFT SIDE OF ROAD			CULVERT					CHANNEL			COMMENT
	STA	INV	OFFSE	STA	INV	OFFS	#	SP	RISE	LGT	SLOPE	SKE	W	SLOPE	
Chan Tran	26300	1294.10	64.0										4	0.0130	gr?
Grade Brk	26350	1294.70	65.0										2	0.0100	
Chan Tran	26500	1296.20	65.0										2	0.0430	gr?
Grade Brk	26547	1298.60	65.0										0	-0.0400	
CBC #11	26681	1293.70	67.0	26618	1293.34	67	6	10	4	148	0.0024	-25.5	0	0.0510	
Grade Brk	26750	1295.50	79.4											0.0148	
Tran End	26900	1297.70	74.0										20	0.0148	
Grade Brk	27000	1299.20	74.0										20	0.0068	
Chan Tran	27025	1299.40	74.0										0	0.0400	
Grade Brk	27070	1301.20	68.0										0	-0.0500	
Grade Brk	27080	1300.00	68.0										0	-0.0085	
Grade Brk	27150	1299.40	68.0										0		
CBC #12	27182	1297.75	67.0	27061	1297.39	67	3	10	3	181	0.0020	-41.5	10	0.1000	
Grade Brk	27220	1299.34	80.0										10	0.0092	
Grade Brk	27400	1301.00	69.8										10	0.0060	
Chan Tran	27750	1303.10	69.0										10	0.0160	
Grade Brk	27800	1303.90	62.0										0	0.0096	
Grade Brk	28043	1306.20	64.0										0	0.0116	
CBC #13	28511	1308.56	67.0	28488	1307.96	67	4	10	4	136	0.0044	-10.0	20	0.0032	
Grade Brk	28690	1310.40	85.8										20	0.0188	
Chan Tran	28850	1313.40	76.0										20	0.0060	
Grade Brk	28930	1316.20	56.0										0		
Ditch End	28950	1316.70	56.0										0		
CBC #14	28970	1312.52	67.0	28881	1312.20	67	1	10	3	161	0.0020	-33.0	10	0.0124	
Grade Brk	29125	1314.60	65.0										10	0.0246	
Grade Brk	29213	1317.20	65.0										0		
RCP 14A	29262	1313.12	68.0	29156	1312.31	69	1	4	4	173	0.0047	-37.0	4	0.0600	
Grade Brk	29300	1316.40	66.0										4	0.0050	
Chan Tran	29620	1317.00	64.0										4	0.0060	
Grade Brk	29670	1317.30	63.0										2	0.0084	
Chan Tran	29888	1319.20	63.0										2	0.0084	
End Tran	29938	1319.70	61.2										0	0.0084	
Grade Brk	29993	1320.20	61.2										0		
Grade Brk	30033	1322.40	56.0										0		
RCP 14B	30100	1318.76	69.5	29962	1317.14	69.5	2	3	3	196	0.0085	-44.5	2	0.0094	
Grade Brk	30200	1319.70	69.5										2	0.0040	
Align Brk	30500	1320.90	64.3										2	0.0040	
Chan Tran	30550	1321.10	63.4										0	0.0027	
Grade Brk	30625	1321.30	62.0										0	0.0040	
Grade Brk	31000	1322.60	62.0										0	0.0093	
Grade Brk	31150	1324.20	61.8										0	0.0321	
Grade Brk	31206	1325.00	66.0										0		
CBC #15	31258	1320.70	67.0	31176	1319.88	67	1	6	3	157	0.0052	-31.0	0		
Grade Brk	31320	1324.37	67.0										0	0.0065	
Grade Brk	31600	1326.20	62.0										0	0.0110	
Grade Brk	31700	1327.30	62.0										0	0.0517	
RCP CMP 15	31791	1324.42	67.0	31555	1322.16	67	2	3	3	271	0.0083	-60.4	0	0.0200	
Grade Brk	31920	1330.20	62.0										0	0.0138	
Grade Brk	32400	1336.70	62.0										0	0.0061	
Grade Brk	32567	1337.80	59.6										0	-0.0144	
RCP 15B	32625	1336.00	72.4	32608	1335.45	73	1	3	3	146	0.0037	-6.5	0	0.0224	
Grade Brk	32700	1338.50	63.9										0		
CBC #16	32758	1335.90	67.0	32656	1335.45	67	3	8	3	169	0.0027	-37.1	0	0.0141	
CBC #17	32954	1336.80	67.0	32900	1336.40	67	2	10	3	144	0.0028	-22.0	0	0.0038	
Chan	33000	1338.50	70.4										0	0.0038	
Grade Brk	33033	1338.60	68.4										0	0.0112	

TABULATION OF ROADWAY CULVERTS & RT DITCH FROM SUN VALLEY PKWAY AS BUILTS
 FOR: THE FLOOD CONTROL DISTRICT OF MARICOPA COUNTY, ARIZONA
 BY: ALPHA ENGINEERING GROUP, INC., 2929 E. CAMELBACK RD., #215, PHOENIX AZ 85016

Printed 02-Nov-93
 Updated 04 Feb 92
 F:\WT\CHANTAB.WQ1

ITEM	RIGHT SIDE OF ROAD			LEFT SIDE OF ROAD			CULVERT					CHANNEL			COMMENT
	STA	INV	OFFSE	STA	INV	OFFS	#	SP	RISE	LGT	SLOPE	SKE	W	SLOPE	
CBC #18	33374	1337.53	67.0	33394	1337.00	67	3	10	4	135	0.0039	8.5	0	0.0190	
CBC #19	33794	1340.00	67.0	33633	1339.00	67	1	10	4	209	0.0048	-50.0	4		
Grade Brk	33822	1341.50	78.0										4	0.0135	
Grade Brk	34000	1344.44	78.0										4	0.0038	
Chan Tran	34500	1345.90	64.0										2	0.0038	
Ditch End	34873	1348.40	63.0										0	0.1000	
RCP 19A	35068	1347.76	70.9	35012	1347.04	72.9	1	3	3	153	0.0048	-20.0	0	0.0167	
Grade Brk	35164	1349.60	68.4										0	0.0568	
Grade Brk	35200	1351.70	64.2										0	0.0100	
Grade Brk	35550	1355.20	61.2										0	0.0327	
CBC #20	35621	1353.40	67.0	35605	1353.11	67	1	6	3	135	0.0021	-6.5	0	0.0053	
Ditch End	35900	1356.50	73.0										0		
CBC #21	36062	1355.00	67.0	36025	1354.56	67	4	10	4	139	0.0032	-15.5	0	0.0171	
Ditch End	36169	1357.70	68.4										0		
RCP 21A	36323	1355.50	71.0	36286	1353.99	75	1	4	4	151	0.0100	-15.5	4	0.0078	
Grade Brk	36700	1358.40	66.0										4	0.0092	
Chan Tran	36921	1360.40	64.0										4	0.0092	
End Tran	36941	1360.60	61.6										0	0.0092	
Ditch End	37400	1364.90	60.0										0	0.0100	
CBC #22	37516	1362.80	67.0	37411	1362.17	67	4	10	3	170	0.0037	-38.0	10	0.0025	
Chan	37558	1363.00	84.0										10	0.0025	
Chan Tran	37630	1363.20	76.4										10	0.0025	
Grade Brk	37650	1363.30	73.8										4	0.0036	
Chan Tran	37980	1364.50	64.5										4	0.0050	
Grade Brk	38000	1364.60	62.0										0	0.0040	
Grade Brk	38200	1365.40	61.2										0	0.0300	
Grade Brk	38220	1366.00	61.0										0	-0.0276	
RCP 22A	38328	1362.17	69.0	38238	1361.08	65	1	4	4	161	0.0067	-34.0	0	0.0800	
Grade Brk	38376	1366.00	60.0										0	0.0040	
Grade Brk	38525	1366.60	60.0										0		
Grade Brk	38580	1368.00	60.0										0		
CBC #23	38653	1362.61	67.0	38558	1361.69	67	1	10	1	165			4		
Grade Brk	38676	1366.60	72.5										4	0.0040	
Align Brk	38694	1366.70	69.0										4	0.0040	
Grade Brk	39000	1367.90	66.7										4	0.0160	
Chan Tran	39020	1368.00	66.6										4	0.0160	
Tran End	39040	1368.40	63.9										0	0.0160	
Ditch End	39725	1378.40	61.0										0		
RCP 23A	39792	1376.61	66.0	39740	1375.82	68	1	3	3	144	0.0057	-21.5	0		
RCP 23B	39870	1377.18	68.0	39832	1376.04	70	1	3	3	143	0.0080	-15.5	4		
Grade Brk	39913	1379.50	67.5										4		
Grade Brk	39928	1379.60	64.0										4	0.0050	
Grade Brk	40000	1379.90	64.0										4	0.0050	
Grade Brk	40100	1380.40	64.0										4	0.0140	
Chan Tran	40150	1380.70	64.0										4	0.0144	
Tran End	40200	1381.40	60.0										0	0.0144	
Grade Brk	40447	1385.00	60.0										0	-0.0051	
CSP 23C	40508	1383.08	68.5	40402	1381.70	68.5	2	3	2	173	0.0080	-38.0	4	0.0153	
Grade Brk	40600	1385.80	67.6										4	0.0146	
	41000	1391.60	67.7										4		
CBC #24	41319	1393.50	67.0	41229	1392.76	67	3	10	3	162	0.0047	-34.3	0		
CBC #25	41636	1395.00	67.0	41527	1394.40	67	6	10	3	172	0.0035	-39.5	5		
Grade Brk	41717	1398.50	78.0										5	0.0050	
Grade Brk	41917	1399.50	77.0										5	0.0240	
Grade Brk	42000	1401.50	71.0										5	0.0050	
Grade Brk	42080	1401.90	70.0										5	0.0207	

TABULATION OF ROADWAY CULVERTS & RT DITCH FROM SUN VALLEY PKWAY AS BUILTS
 FOR: THE FLOOD CONTROL DISTRICT OF MARICOPA COUNTY, ARIZONA
 BY: ALPHA ENGINEERING GROUP, INC., 2929 E. CAMELBACK RD., #215, PHOENIX AZ 85016

Printed 02-Nov-93
 Updated 04 Feb 92
 F:\WT\CHANTAB.WQ1

ITEM	RIGHT SIDE OF ROAD			LEFT SIDE OF ROAD			CULVERT					CHANNEL			COMMENT
	STA	INV	OFFSE	STA	INV	OFFS	#	SP	RISE	LGT	SLOPE	SKE	W	SLOPE	
Grade Brk	42220	1404.80	64.0										5	0.0111	
Grade Brk	42400	1406.80	62.5										5	-0.0279	
CSPA 25A	42535	1404.00	67.0	42439	1402.43	67	2	3	2	164	0.0096	-36.0	5	0.0106	
Grade Brk	42860	1407.45	70.0										5	0.1000	
Ditch End	42900	1410.40	70.0										0		
Bgn Ditch	42950	1412.00	65.0										5	-0.0260	
Grade Brk	43000	1410.70	65.0										5		
CBC #26	43082	1404.60	71.0	43056	1402.30	70	2	8	5	144	0.0160	-10.0	5		
Grade Brk	43165	1409.62	75.0										5	0.0240	
Grade Brk	43250	1411.80	62.5										5	0.0050	
Ditch End	43690	1414.00	62.5										0		
CSP 26A	43719	1410.17	70.0	43716	1407.66	72	2	3	2	142	0.0177	-1.4			
Bgn Ditch	43796	1414.00	62.5										5	-0.0035	
Grade Brk	44000	1413.30	62.5										5	-0.0031	
Grade Brk	44295	1412.40	62.5										5	-0.0432	
CBC #27	44384	1406.90	67.0	44278	1403.90	70	1	8	4	175	0.0172	-37.1	5	0.0694	
Grade Brk	44474	1411.80	62.5										5	-0.0039	
Grade Brk	44526	1411.70	62.5										5	-0.0273	
CBC #28	44624	1406.80	67.0	44628	1405.10	67	1	8	4	134	0.0129	1.7	5		
Grade Brk	44650	1407.80	73.0										5	0.0049	
Grade Brk	44940	1410.86	71.0										5	0.0473	
Grade Brk	45000	1413.70	62.5										5	0.0060	
Grade Brk	45300	1415.50	62.5										5	-0.0395	PC=45384.85 L=2
CBC #29	45401	1409.70	67.0	45472	1407.80	70	2	8	5	156	0.0123	27.4	5		
Grade Brk	45428	1411.50	82.0										5	0.0133	
Grade Brk	45518	1412.70	71.0										5	0.0056	
Grade Brk	45575	1413.00	71.0										5	0.0056	
Grade Brk	45675	1413.60	71.0										5	0.0216	
Grade Brk	45800	1416.80	62.5										5	0.0056	
Grade Brk	46000	1417.40	62.5										0		
CBC #30	46045	1412.00	68.0	46065	1410.00	76	1	6	5	145	0.0138	7.9	0		
Grade Brk	46060	1414.00	74.0										0	0.0556	
Grade Brk	46100	1416.50	62.0										0	0.0159	
Grade Brk	46235	1418.60	60.0										0	-0.0444	
CSP 30A	46330	1413.24	69.0	46330	1412.04	79	2	3	3	148	0.0081	0.0	5		
Grade Brk	46340	1415.00	82.0										5	0.0314	
Grade Brk	46440	1418.30	60.0										5	-0.0020	
Grade Brk	46500	1418.20	62.5										5	-0.0030	
Grade Brk	47000	1416.70	62.5										5	-0.0030	
Grade Brk	47260	1415.90	64.0										5	-0.0127	
Grade Brk	47330	1415.00	74.0										5		
CBC #31	47345	1412.98	67.0	47392	1410.80	67	1	8	3	142	0.0163	19.9	5		
Grade Brk	47370	1415.00	74.0										5	0.0030	
Grade Brk	47463	1415.10	65.7										5	-0.0030	
Grade Brk	47563	1414.80	67.3										5	-0.0030	
Grade Brk	47680	1414.40	78.6										5		
CBC #32	47700	1412.90	67.0	47677	1411.50	67	1	6	3	137	0.0104	-9.9	5		
Grade Brk	47715	1414.50	220.0										20	-0.0052	
Grade Brk	47840	1413.48	95.0										20	-0.0040	
Grade Brk	47961	1416.00	95.0										20		
CBC #33	48011	1411.50	67.0	48011	1411.00	75	6	10	5	142	0.0035	0.0	0	0.0000	
CBC #34	48111	1411.50	67.0	48096	1411.00	75	6	10	5	143	0.0035	-6.0	0	0.0000	
CBC #35	48282	1411.50	67.0	48200	1411.00	75	3	12	5	164	0.0030	-30.0	5		
Grade Brk	48333	1417.00	77.0										5	0.0098	
Grade Brk	48395	1417.60	62.5										5	0.0050	
Grade Brk	48455	1417.90	62.5										5	-0.0026	

TABULATION OF ROADWAY CULVERTS & RT DITCH FROM SUN VALLEY PKWAY AS BUILTS
 FOR: THE FLOOD CONTROL DISTRICT OF MARICOPA COUNTY, ARIZONA
 BY: ALPHA ENGINEERING GROUP, INC., 2929 E. CAMELBACK RD., #215, PHOENIX AZ 85016

Printed 02-Nov-93
 Updated 04 Feb 92
 F:\WT\CHANTAB.WQ1

ITEM	RIGHT SIDE OF ROAD			LEFT SIDE OF ROAD			CULVERT					CHANNEL			COMMENT
	STA	INV	OFFSE	STA	INV	OFFS	#	SP	RISE	LGT	SLOPE	SKE	W	SLOPE	
Grade Brk	48530	1417.70	62.5										5	-0.0026	
Grade Brk	48655	1417.40	62.5										5	-0.0045	
Grade Brk	48755	1416.90	62.5										5	-0.0045	
Grade Brk	48876	1416.40	62.5										5	-0.0045	
Grade Brk	48905	1416.30	62.5										5	-0.0386	
CSPA 35A	48972	1414.13	67.0	49078	1410.86	86	1	3	2	186	0.0177	34.7	5	0.0148	
Grade Brk	49000	1415.20	67.0										5	0.0148	
Grade Brk	49125	1416.40	62.5										5	0.0037	
Grade Brk	49200	1416.70	62.5										5	-0.0254	
Grade Brk	49265	1416.00	80.0										5		
CBC #36	49279	1412.56	67.0	49262	1411.20	79	1	10	3	146	0.0094	-6.9	5		
Grade Brk	49295	1413.60	80.0										5	0.0064	
Grade Brk	49345	1413.90	75.0										5	0.0037	
Grade Brk	49400	1417.40	62.5										5	0.0037	
Grade Brk	49500	1417.80	62.5										5	0.0037	
Grade Brk	49600	1418.10	62.5										5	-0.0225	
CSP 36A	49682	1416.30	67.0	49691	1414.71	78	1	2	2	146	0.0110	3.6	10	0.0182	
Grade Brk	49742	1417.30	73.0										10	-0.0017	
Grade Brk	49842	1417.10	74.0										10	-0.0017	
Grade Brk	50000	1417.00	75.0										10	-0.0017	
CSPA 36B	50012	1416.92	67.0	49909	1414.90	80	1	4	2	179	0.0112	-35.0	5	0.0383	
Grade Brk	50100	1420.00	62.5										5	0.0037	
Grade Brk	50200	1420.40	62.5										5	-0.0237	
Grade Brk	50257	1419.00	69.0										5	-0.0030	
Grade Brk	50360	1418.70	71.0										5	-0.0030	
Grade Brk	50460	1418.40	75.0										5	-0.0100	
Grade Brk	50493	1418.10	82.0										5		
CSPA 36C	50504	1416.72	72.0	50383	1412.80	96.5	2	4	2	205	0.0190	-35.3	5		
Grade Brk	50535	1419.00	75.0										5	0.0049	
Grade Brk	50623	1419.40	75.0										5	0.0049	PT=50742.37 on c/l
Grade Brk	50743	1420.00	77.0										5	0.0377	
Grade Brk	50876	1424.90	62.5										5	0.0064	
Grade Brk	51000	1425.70	60.0										5		
Grade Brk	51180	1426.70	60										5	0.0066	
CBC #37	51267	1423.11	67	51267	1422	67	4	10	4	135	0.0085	0.0	5		
Grade Brk	51302	1424	81										5	0.0057	
Grade Brk	51422	1424.6	70.3										5	0.0556	
Grade Brk	51465	1427.1	60										5	-0.003	
Grade Brk	51736	1426.4	60										5	-0.0189	
Grade Brk	51736	1425.7	66										5	-0.0088	
Grade Brk	51821	1425	75										5	-0.025	
CBC #38	51875	1420.38	67	51825	1419.82	67	6	12	5	144	0.0040	-19.3	5		
Grade Brk	51942	1421.9	88										6	0.0053	
Grade Brk	52000	1422.2	78										10	0.0065	
Grade Brk	52150	1423	68										5	0.0055	
Grade Brk	52260	1423.6	71										5	0.0405	
Grade Brk	52300	1425.5	62.5										5	0.0056	
Grade Brk	52500	1426.4	62.5										5	0.0638	
CSPA 38A	52544	1423.62	72.6	52515	1422.41	67	1	4.8	3.17	143	0.0080	-12.0	5	0.0622	
Grade Brk	52600	1426.8	62.5										5	0.0065	
Grade Brk	52677	1427.3	63										5	0.0065	
Grade Brk	52815	1428.2	62.5										5	-0.0052	
Grade Brk	52950	1427.5	68										5	-0.0521	
CSPA 38B	53005	1424.4	79.8	52984	1421.6	86	1	4.8	3.17	167	0.0162	-7.5	10	0.0027	Plan L=155
Grade Brk	53121	1424.6	86.2										10		
Grade Brk	53164	1430.2	62.5										5	0.0056	

TABULATION OF ROADWAY CULVERTS & RT DITCH FROM SUN VALLEY PKWAY AS BUILTS
 FOR: THE FLOOD CONTROL DISTRICT OF MARICOPA COUNTY, ARIZONA
 BY: ALPHA ENGINEERING GROUP, INC., 2929 E. CAMELBACK RD., #215, PHOENIX AZ 85016

Printed 02-Nov-93
 Updated 04 Feb 92
 F:\WT\CHANTAB.WQ1

ITEM	RIGHT SIDE OF ROAD			LEFT SIDE OF ROAD				CULVERT				CHANNEL			COMMENT
	STA	INV	OFFSE	STA	INV	OFFS	#	SP	RISE	LGT	SLOPE	SKE	W	SLOPE	
Grade Brk	53840	1434	62.5										5		
Grade Brk	53870	1431.6	71										10	-0.01	
CBC #39	53944	1430.32	67	53950	1429	67	1	10	3	134	0.0099	2.6	5	0.0547	
Grade Brk	54000	1433.2	69										5	0.0547	
Grade Brk	54024	1434.5	63										5	0.0035	
Grade Brk	54297	1435.5	62.5										5		
Grade Brk	54317	1432.5	72										5	-0.0163	
CSPA 39A	54413	1429.99	77	54413	1427.15	90	1	4.8	3.17	167	0.0180	0.0	5	0.0244	
Grade Brk	54470	1432.1	76										5		
Grade Brk	54491	1436.1	62.5										5	0.0035	
Grade Brk	54780	1437.2	62.5										5		
CBC #40	54916	1431.2	71.4	54916	1428.8	81	1	6	5	152	0.0158	0.0	5	0.0842	
Grade Brk	55000	1437.9	62.5										5	-0.0523	
CSPA 40A	55067	1434.62	67	55034	1429.85	87	1	2.9	2	158	0.0304	-11.8	5	0.0375	
Grade Brk	55150	1437.8	62.5										5	-0.0046	
Grade Brk	55237	1437.1	62.5										5	-0.0432	
CSPA 40B	55275	1435.62	67	55253	1432.05	75	1	2.3	1.67	144	0.0245	-8.9	5	0.0375	
Grade Brk	55297	1437	62.5										5	-0.0046	
Grade Brk	55480	1436.2	62.5										5	-0.0466	
CSPA 40C	55508	1434.14	67.7	55609	1427.33	88	1	2.3	1.67	186	0.0370	33.3	5	0.0377	
Grade Brk	55550	1435.7	62.5										5	-0.005	
Grade Brk	55650	1435.2	62.5										5	-0.075	
Grade Brk	55690	1432.2	68										5	-0.024	
CSPA 40D	55740	1430.95	76.8	55773	1429.16	80	1	4.1	2.75	161	0.0120	12.0	5	0.0328	
Grade Brk	55808	1433.2	71										5	0.0568	
Grade Brk	55860	1436.7	62.5										5	0.0073	
Grade Brk	56000	1436.8	62.5										5	0.0073	
Grade Brk	56140	1437.8	62.5										5	-0.0418	
CBC #41	56195	1435	67	56221	1434.18	67	1	6	3	137	0.0061	11.1	5	0.0316	
Grade Brk	56300	1439	62.5										5	0.0073	
Grade Brk	56750	1442.2	62.5										5	-0.026	
CSPA 41A	56823	1440.51	69.9	56815	1438.17	71	1	3.5	2.42	141	0.0156	-2.5	5	0.0377	
Grade Brk	56900	1443.2	62.5										5	0.003	
Grade Brk	57000	1443.5	62.5										5	0.003	
Grade Brk	57105	1443.8	62.5										5	-0.00299	END OF PROJECT
END OF PR															
Grade Brk	57250	1443.5	62.5										5	-0.003	
Grade Brk	57302	1443.08	65										10	-0.003	
Grade Brk	57489	1442.8	65										10		
Grade Brk	57505	1441	68										10		
Grade Brk	57580	1439	84										15	-0.019	
CBC #42	57707	1437.2	67	57762	1436.2	67	3	10	5	145	0.0070	22.6	5		
Grade Brk	57740	1438	87.5										5	0.0513	
Grade Brk	57850	1443.9	62.5										5	-0.0267	
Grade Brk	58000	1439.9	80										5		
CBC #43	58068	1437.96	67	57980	1436.46	71	3	12	6	164	0.0093	-32.5	10		
Grade Brk	58115	1439.5	83										10	0.06	
Grade Brk	58200	1444.4	67										10	0.0086	

WHITE TANKS WASH FLOOD INSURANCE STUDY REVISED 92/01/23
 SPOT POSITIONS AND ELEVATIONS
 ALONG DITCH WEST OF SUN VALLEY PARKWAY

POINT	EASTING	NORTHING	ELEV	DIST	STA
1	268261.297	889220.000	1065.023	0.00	-1479.82
2	268326.594	889224.109	1065.188	65.43	-1414.37
3	268319.563	889275.719	1066.768	80.62	-1399.18
4	268303.844	889346.672	1067.859	133.63	-1346.15
5	268286.859	889425.312	1069.385	206.90	-1272.86
6	268272.844	889486.172	1071.656	266.42	-1213.32
7	268264.953	889547.578	1072.965	327.60	-1152.13
8	268262.547	889643.750	1073.729	423.75	-1055.95
9	268258.125	889766.266	1075.199	546.28	-933.38
10	268256.703	889908.453	1076.836	688.47	-791.15
11	268252.250	890167.250	1078.580	947.29	-532.26
12	268248.797	890382.156	1080.760	1162.22	-317.27
13	268242.172	890652.859	1083.322	1432.99	-46.42
14	268235.328	890938.359	1086.207	1718.56	239.23
15	268231.359	891192.062	1087.680	1972.29	493.03
16	268227.781	891402.625	1090.076	2182.88	703.68
17	268226.297	891569.797	1092.033	2350.06	870.91
18	268227.484	891656.609	1092.965	2436.84	957.72
19	268226.500	891767.328	1094.219	2547.57	1068.48
20	268224.844	891891.578	1094.383	2671.83	1192.77
21	268225.250	891945.969	1094.383	2726.21	1247.17
22	268225.609	891946.594	1098.889	2726.83	1247.79
23	268224.516	891968.859	1100.633	2749.11	1270.08
24	268224.453	891979.344	1100.633	2759.59	1280.56
25	268224.312	891979.969	1100.252	2760.22	1281.19
26	268224.781	892013.531	1099.869	2793.77	1314.75
27	268225.266	892048.859	1099.869	2829.09	1350.08
28	268225.266	892048.859	1101.014	2829.09	1350.08
29	268225.344	892054.484	1101.014	2834.71	1355.70
30	268225.734	892082.281	1100.523	2862.50	1383.50
31	268225.734	892082.281	1096.496	2862.50	1383.50
32	268220.812	892137.031	1097.041	2917.31	1438.32
33	268218.687	892207.438	1098.293	2987.74	1508.77
34	268215.953	892353.875	1099.875	3134.20	1655.28
35	268216.156	892566.063	1101.400	3346.37	1867.51
36	268214.656	892751.125	1103.691	3531.43	2052.62
37	268216.391	892937.250	1104.836	3717.52	2238.76
38	268214.172	893116.328	1106.090	3896.61	2417.90
39	268213.484	893295.031	1107.449	4075.31	2596.66
40	268212.375	893493.953	1109.793	4274.23	2795.63
41	268213.375	893743.016	1111.428	4523.27	3044.74
42	268212.547	893976.547	1113.881	4756.80	3278.34
43	268213.187	894331.469	1116.811	5111.70	3633.34
44	268212.891	894608.562	1121.010	5388.78	3910.50
45	268212.922	894889.375	1122.971	5669.58	4191.38
46	268210.250	895151.578	1124.934	5931.80	4453.68
47	268209.000	895355.422	1126.566	6135.64	4657.57
48	268210.406	895624.750	1128.639	6404.95	4926.96
49	268209.437	895894.109	1130.328	6674.31	5196.40
50	268210.594	896118.828	1132.672	6899.01	5421.16
51	268209.375	896334.703	1134.846	7114.89	5637.10
52	268207.531	896566.484	1137.844	7346.68	5868.96
53	268207.344	896791.500	1139.752	7571.69	6094.04
54	268207.641	896974.906	1141.006	7755.09	6277.49
55	268208.344	897107.219	1141.660	7887.40	6409.84
56	268209.828	897240.516	1141.957	8020.68	6543.15
57	268211.281	897345.719	1142.666	8125.87	6648.37
58	268211.281	897345.719	1147.607	8125.87	6648.37
59	268211.625	897371.109	1147.826	8151.26	6673.77
60	268211.719	897377.312	1147.826	8157.46	6679.97
61	268211.719	897377.312	1147.389	8157.46	6679.97
62	268212.203	897412.422	1147.879	8192.57	6715.09
63	268212.687	897447.469	1148.861	8227.61	6750.14
64	268212.687	897447.531	1149.291	8227.67	6750.20
65	268213.172	897482.578	1149.291	8262.72	6785.26

WHITE TANKS WASH FLOOD INSURANCE STUDY REVISED 92/01/23
 SPOT POSITIONS AND ELEVATIONS
 ALONG DITCH WEST OF SUN VALLEY PARKWAY

POINT	EASTING	NORTHING	ELEV	DIST	STA
66	268213.172	897482.578	1145.168	8262.72	6785.26
67	268213.734	897559.281	1145.330	8339.42	6861.99
68	268212.625	897661.422	1145.984	8441.56	6964.15
69	268214.578	897818.703	1146.912	8598.83	7121.47
70	268216.109	897985.266	1149.092	8765.38	7288.07
71	268217.172	898184.438	1151.219	8964.55	7487.29
72	268218.547	898390.766	1153.121	9170.87	7693.67
73	268219.031	898599.937	1154.813	9380.03	7902.89
74	268222.141	898778.453	1156.869	9558.53	8081.44
75	268223.016	898908.141	1157.523	9688.22	8211.17
76	268223.594	899067.406	1158.178	9847.48	8370.48
77	268224.891	899227.578	1158.613	10007.64	8530.68
78	268224.297	899316.484	1158.994	10096.55	8619.62
79	268224.953	899466.594	1160.412	10246.66	8769.77
80	268225.984	899632.469	1161.992	10412.53	8935.69
81	268226.406	899750.141	1162.430	10530.20	9053.39
82	268224.578	899759.656	1163.629	10539.72	9062.91
83	268224.531	899842.437	1164.338	10622.50	9145.72
84	268225.453	899940.031	1164.773	10720.09	9243.34
85	268227.188	900025.531	1166.137	10805.58	9328.85
86	268225.719	900035.266	1166.682	10815.32	9338.59
87	268227.172	900136.172	1167.607	10916.23	9439.53
88	268228.391	900224.688	1168.045	11004.74	9528.07
89	268228.563	900236.719	1169.189	11016.77	9540.10
90	268229.547	900313.562	1169.680	11093.61	9616.96
91	268229.844	900350.156	1170.170	11130.20	9653.56
92	268229.719	900361.281	1171.316	11141.33	9664.70
93	268227.859	900404.797	1171.971	11184.85	9708.23
94	268229.328	900510.984	1173.496	11291.03	9814.44
95	268228.781	900517.469	1174.748	11297.52	9820.93
96	268229.453	900616.766	1175.838	11396.81	9920.25
97	268230.125	900665.672	1176.221	11445.71	9969.16
98	268230.047	900674.469	1177.420	11454.51	9977.97
99	268230.016	900749.359	1178.020	11529.40	10052.88
100	268230.609	900796.922	1178.783	11576.96	10100.45
101	268230.750	900817.906	1178.783	11597.95	10121.45
102	268230.688	900828.172	1179.438	11608.21	10131.71
103	268230.719	900896.312	1180.092	11676.35	10199.87
104	268230.031	900994.141	1181.236	11774.18	10297.73
105	268230.203	901068.187	1183.635	11848.23	10371.80
106	268230.250	901106.891	1183.799	11886.93	10410.51
107	268231.203	901124.969	1183.961	11905.01	10428.59
108	268231.203	901124.969	1180.328	11905.01	10428.59
109	268231.469	901144.875	1179.836	11924.91	10448.50
110	268231.828	901170.922	1180.654	11950.96	10474.56
111	268231.828	901170.922	1182.891	11950.96	10474.56
112	268231.922	901187.594	1182.891	11967.63	10491.23
113	268232.359	901213.500	1182.127	11993.53	10517.14
114	268233.000	901260.922	1182.563	12040.96	10564.58
115	268233.734	901323.687	1183.598	12103.72	10627.36
116	268233.656	901404.203	1184.416	12184.23	10707.89
117	268232.578	901473.969	1184.906	12254.00	10777.68
118	268233.344	901570.031	1185.451	12350.06	10873.77
119	268233.906	901647.297	1186.543	12427.33	10951.06
120	268234.406	901734.344	1187.578	12514.37	11038.13
121	268236.125	901827.375	1189.650	12607.40	11131.19
122	268237.531	901868.391	1188.941	12648.41	11172.21
123	268237.531	901868.391	1186.670	12648.41	11172.21
124	268237.844	901891.109	1186.342	12671.13	11194.93
125	268238.125	901911.375	1187.051	12691.40	11215.21
126	268238.281	901923.344	1187.051	12703.36	11227.17
127	268237.797	901923.484	1188.795	12703.51	11227.32
128	268238.219	901954.453	1189.014	12734.47	11258.29
129	268238.625	901983.297	1188.305	12763.32	11287.15
130	268239.141	902021.297	1189.395	12801.32	11325.16

WHITE TANKS WASH FLOOD INSURANCE STUDY REVISED 92/01/23
 SPOT POSITIONS AND ELEVATIONS
 ALONG DITCH WEST OF SUN VALLEY PARKWAY

POINT	EASTING	NORTHING	ELEV	DIST	STA
131	268238.375	902072.203	1190.377	12852.22	11376.08
132	268237.469	902098.047	1190.486	12878.07	11401.93
133	268240.000	902171.168	1191.662	12951.19	11475.07
134	268239.187	902239.232	1192.045	13019.25	11543.15
135	268237.766	902323.219	1193.625	13103.24	11627.17
136	268236.891	902395.072	1194.443	13175.09	11699.04
137	268239.375	902421.833	1193.734	13201.85	11725.81
138	268239.578	902432.329	1193.844	13212.35	11736.31
139	268239.766	902445.583	1193.953	13225.60	11749.56
140	268241.484	902448.969	1191.826	13228.98	11752.94
141	268241.703	902496.500	1192.154	13276.51	11800.49
142	268241.234	902563.204	1192.154	13343.22	11867.22
143	268241.406	902640.028	1192.754	13420.04	11944.06
144	268241.734	902724.591	1193.789	13504.61	12028.65
145	268240.469	902803.386	1194.225	13583.40	12107.46
146	268239.641	902878.000	1194.279	13658.02	12182.11
147	268236.484	902929.847	1194.334	13709.87	12233.97
148	268235.781	902995.038	1194.662	13775.06	12299.18
149	268236.359	903073.370	1195.262	13853.39	12377.53
150	268234.562	903162.127	1195.643	13942.15	12466.32
151	268232.391	903246.721	1196.625	14026.75	12550.94
152	268230.609	903347.389	1197.170	14127.42	12651.64
153	268229.688	903416.430	1197.387	14196.47	12720.71
154	268230.437	903495.191	1198.424	14275.22	12799.48
155	268227.859	903573.186	1198.859	14353.22	12877.51
156	268227.109	903646.283	1199.623	14426.32	12950.63
157	268227.344	903711.354	1200.168	14491.39	13015.71
158	268226.219	903757.441	1200.986	14537.48	13061.82
159	268225.781	903821.655	1201.641	14601.70	13126.06
160	268224.750	903894.377	1203.111	14674.42	13198.80
161	268224.953	903961.615	1203.930	14741.66	13266.06
162	268224.469	904038.607	1204.639	14818.65	13343.07
163	268224.922	904115.424	1205.729	14895.47	13419.91
164	268225.609	904182.655	1205.729	14962.70	13487.16
165	268226.234	904236.082	1205.947	15016.12	13540.59
166	268226.453	904257.083	1207.746	15037.12	13561.60
167	268222.031	904279.069	1208.236	15059.12	13583.61
168	268222.062	904293.632	1206.113	15073.68	13598.17
169	268222.203	904319.779	1206.113	15099.83	13624.33
170	268222.437	904337.208	1205.623	15117.26	13641.76
171	268222.594	904361.460	1206.277	15141.51	13666.02
172	268222.344	904379.329	1206.441	15159.38	13683.90
173	268222.594	904420.851	1206.604	15200.90	13725.43
174	268221.922	904475.756	1206.768	15255.81	13780.35
175	268216.453	904524.394	1207.203	15304.46	13829.02
176	268214.391	904580.617	1207.477	15360.69	13885.26
177	268214.344	904605.305	1207.531	15385.38	13909.96
178	268215.859	904637.010	1207.748	15417.08	13941.67
179	268215.875	904646.809	1207.313	15426.88	13951.47
180	268215.531	904677.780	1208.295	15457.85	13982.45
181	268212.000	904728.882	1208.895	15508.96	14033.58
182	268209.016	904785.172	1209.984	15565.26	14089.89
183	268207.891	904842.953	1210.693	15623.04	14147.69
184	268206.984	904900.624	1211.783	15680.72	14205.38
185	268205.187	904968.809	1212.656	15748.91	14273.59
186	268204.594	905036.762	1213.746	15816.86	14341.56
187	268203.484	905111.759	1214.672	15891.86	14416.59
188	268203.453	905185.389	1215.545	15965.49	14490.24
189	268204.641	905245.358	1215.545	16025.46	14550.22
190	268207.219	905287.172	1215.709	16067.26	14592.04
191	268209.453	905306.632	1216.090	16086.72	14611.50
192	268215.766	905312.988	1214.455	16093.05	14617.83
193	268215.953	905334.642	1214.727	16114.71	14639.50
194	268214.219	905363.089	1216.090	16143.16	14667.96
195	268210.875	905417.326	1216.744	16197.40	14722.21

WHITE TANKS WASH FLOOD INSURANCE STUDY REVISED 92/01/23
 SPOT POSITIONS AND ELEVATIONS
 ALONG DITCH WEST OF SUN VALLEY PARKWAY

POINT	EASTING	NORTHING	ELEV	DIST	STA
196	268215.047	905463.559	1216.799	16243.62	14768.45
197	268217.875	905468.339	1213.910	16248.40	14773.23
198	268218.125	905479.596	1212.873	16259.65	14784.48
199	268218.297	905491.449	1213.801	16271.51	14796.34
200	268218.328	905497.622	1216.031	16277.68	14802.52
201	268219.156	905550.775	1215.869	16330.83	14855.68
202	268222.750	905623.325	1214.832	16403.37	14928.24
203	268225.219	905685.119	1215.596	16465.16	14990.05
204	268226.687	905741.458	1216.686	16521.49	15046.40
205	268229.250	905777.155	1217.232	16557.19	15082.11
206	268231.312	905817.188	1217.559	16597.22	15122.15
207	268231.281	905822.330	1219.467	16602.36	15127.29
208	268231.375	905825.953	1219.303	16605.98	15130.91
209	268233.203	905831.560	1217.068	16611.58	15136.51
210	268234.281	905863.380	1217.887	16643.40	15168.34
211	268235.422	905914.582	1219.086	16694.60	15219.55
212	268237.234	905988.726	1219.793	16768.74	15293.72
213	268242.328	906075.711	1220.666	16855.72	15380.72
214	268247.953	906169.402	1221.102	16949.41	15474.44
215	268253.250	906271.326	1222.520	17051.33	15576.39
216	268258.219	906369.792	1223.119	17149.79	15674.87
217	268261.719	906471.092	1223.609	17251.09	15776.20
218	268267.625	906573.553	1224.102	17353.55	15878.69
219	268271.953	906668.943	1224.646	17448.95	15974.12
220	268274.844	906760.891	1225.518	17540.90	16066.10
221	268278.375	906849.313	1226.881	17629.32	16154.54
222	268283.031	906935.229	1227.809	17715.24	16240.49
223	268288.391	907026.009	1229.389	17806.03	16331.30
224	268290.141	907073.736	1229.824	17853.76	16379.05
225	268290.656	907112.013	1230.262	17892.04	16417.34
226	268292.984	907141.897	1231.127	17921.93	16447.24
227	268293.609	907144.113	1231.998	17924.14	16449.45
228	268299.109	907223.837	1232.598	18003.88	16529.21
229	268307.344	907341.376	1233.035	18121.43	16646.79
230	268315.531	907452.060	1234.615	18232.14	16757.53
231	268322.391	907546.010	1235.814	18326.11	16851.53
232	268324.719	907587.525	1236.742	18367.63	16893.06
233	268326.234	907606.473	1236.742	18386.59	16912.03
234	268327.141	907614.158	1236.250	18394.28	16919.72
235	268327.828	907618.055	1233.486	18398.18	16923.62
236	268329.375	907632.154	1232.396	18412.28	16937.73
237	268329.109	907646.886	1230.979	18427.01	16952.46
238	268329.125	907660.496	1232.504	18440.62	16966.07
239	268330.688	907688.422	1234.412	18468.55	16994.01
240	268328.375	907699.778	1235.939	18479.90	17005.37
241	268327.812	907724.731	1236.047	18504.85	17030.32
242	268329.984	907789.779	1236.211	18569.91	17095.40
243	268331.422	907831.440	1237.027	18611.57	17137.07
244	268332.344	907866.463	1238.609	18646.60	17172.11
245	268333.500	907902.062	1237.682	18682.20	17207.72
246	268336.109	907939.078	1236.537	18719.23	17244.76
247	268338.016	907969.146	1237.463	18749.30	17274.84
248	268336.875	907988.765	1236.264	18768.92	17294.47
249	268337.484	907994.904	1235.070	18775.06	17300.61
250	268340.375	908021.979	1235.342	18802.15	17327.71
251	268339.875	908046.048	1234.361	18826.21	17351.77
252	268340.031	908073.039	1235.396	18853.20	17378.77
253	268338.734	908077.154	1237.955	18857.31	17382.88
254	268339.797	908111.506	1237.684	18891.67	17417.25
255	268340.625	908149.695	1236.377	18929.86	17455.45
256	268341.438	908209.072	1237.303	18989.24	17514.85
257	268340.109	908287.959	1238.502	19068.12	17593.75
258	268336.828	908354.260	1238.557	19134.41	17660.06
259	268336.516	908426.393	1239.211	19206.54	17732.21
260	268335.531	908514.934	1240.029	19295.08	17820.78

WHITE TANKS WASH FLOOD INSURANCE STUDY REVISED 92/01/23
 SPOT POSITIONS AND ELEVATIONS
 ALONG DITCH WEST OF SUN VALLEY PARKWAY

POINT	EASTING	NORTHING	ELEV	DIST	STA
261	268335.359	908595.383	1240.574	19375.52	17901.24
262	268332.219	908680.512	1241.719	19460.64	17986.39
263	268331.000	908766.736	1242.646	19546.86	18072.63
264	268331.406	908850.988	1243.463	19631.11	18156.90
265	268331.469	908936.094	1244.391	19716.22	18242.04
266	268331.875	909015.281	1245.861	19795.41	18321.25
267	268331.109	909066.279	1246.133	19846.40	18372.26
268	268331.391	909157.297	1247.115	19937.42	18463.30
269	268329.969	909242.729	1247.605	20022.85	18548.76
270	268330.562	909318.736	1249.078	20098.86	18624.79
271	268328.594	909404.555	1250.223	20184.67	18710.62
272	268327.812	909493.018	1250.277	20273.13	18799.11
273	268326.844	909590.490	1250.713	20370.60	18896.61
274	268325.266	909671.090	1251.148	20451.19	18977.22
275	268322.859	909762.836	1251.912	20542.93	19068.99
276	268321.891	909843.371	1252.785	20623.46	19149.54
277	268322.078	909939.137	1253.656	20719.23	19245.34
278	268321.453	910010.377	1254.311	20790.46	19316.59
279	268320.172	910078.639	1254.748	20858.72	19384.87
280	268319.781	910146.479	1256.164	20926.56	19452.72
281	268320.484	910215.395	1257.527	20995.48	19521.66
282	268320.891	910291.641	1257.963	21071.73	19597.94
283	268320.812	910354.436	1259.000	21134.52	19660.74
284	268320.422	910421.348	1259.545	21201.43	19727.67
285	268320.141	910470.768	1260.580	21250.85	19777.11
286	268319.687	910529.029	1261.670	21309.11	19835.38
287	268319.938	910595.436	1263.252	21375.52	19901.81
288	268320.344	910645.111	1264.451	21425.19	19951.50
289	268320.609	910678.572	1264.615	21458.65	19984.97
290	268320.844	910681.213	1261.406	21461.30	19987.62
291	268322.703	910702.900	1261.352	21482.99	20009.31
292	268321.156	910723.764	1261.789	21503.85	20030.18
293	268319.781	910729.303	1264.449	21509.38	20035.71
294	268319.188	910766.994	1264.395	21547.07	20073.41
295	268320.594	910803.381	1264.178	21583.46	20109.81
296	268320.953	910852.242	1264.613	21632.32	20158.69
297	268319.328	910912.264	1266.412	21692.34	20218.72
298	268318.172	910941.197	1266.412	21721.27	20247.66
299	268318.766	910944.072	1264.449	21724.15	20250.54
300	268319.687	910954.535	1263.850	21734.61	20261.01
301	268318.687	910967.604	1264.613	21747.68	20274.08
302	268317.625	910970.332	1266.518	21750.40	20276.80
303	268318.937	910989.902	1265.154	21769.98	20296.39
304	268318.641	911052.283	1265.646	21832.36	20358.78
305	268317.391	911124.789	1267.607	21904.86	20431.30
306	268315.859	911172.877	1268.100	21952.94	20479.40
307	268315.422	911197.375	1267.990	21977.44	20503.91
308	268315.984	911202.592	1266.246	21982.66	20509.13
309	268317.437	911217.953	1265.154	21998.02	20524.49
310	268316.094	911228.283	1266.736	22008.35	20534.82
311	268315.063	911232.314	1268.533	22012.38	20538.86
312	268313.562	911275.500	1268.643	22055.56	20582.05
313	268312.641	911330.107	1267.279	22110.17	20636.67
314	268313.062	911376.404	1267.824	22156.46	20682.98
315	268312.656	911430.742	1268.479	22210.80	20737.33
316	268312.203	911517.973	1268.479	22298.03	20824.59
317	268309.016	911604.248	1269.568	22384.30	20910.88
318	268308.047	911687.449	1270.605	22467.50	20994.11
319	268309.437	911745.184	1270.660	22525.24	21051.86
320	268308.906	911805.744	1272.186	22585.79	21112.43
321	268308.250	911887.713	1272.676	22667.76	21194.42
322	268307.297	911964.004	1272.949	22744.05	21270.73
323	268306.922	912048.998	1273.439	22829.04	21355.75
324	268308.312	912118.768	1274.584	22898.82	21425.55
325	268304.750	912196.592	1274.912	22976.63	21503.38

WHITE TANKS WASH FLOOD INSURANCE STUDY REVISED 92/01/23
 SPOT POSITIONS AND ELEVATIONS
 ALONG DITCH WEST OF SUN VALLEY PARKWAY

POINT	EASTING	NORTHING	ELEV	DIST	STA
326	268304.406	912253.922	1275.730	23033.96	21560.73
327	268303.187	912325.613	1276.820	23105.65	21632.44
328	268301.625	912405.342	1277.801	23185.38	21712.19
329	268302.203	912477.652	1279.055	23257.69	21784.52
330	268302.812	912534.875	1279.600	23314.91	21841.76
331	268304.578	912545.465	1279.055	23325.51	21852.36
332	268305.391	912547.674	1278.936	23327.72	21854.57
333	268305.391	912547.674	1277.102	23327.72	21854.57
334	268305.562	912554.598	1276.283	23334.64	21861.49
335	268305.828	912562.385	1276.883	23342.43	21869.29
336	268305.969	912566.764	1277.701	23346.81	21873.67
337	268305.953	912567.848	1279.824	23347.89	21874.75
338	268306.641	912588.408	1279.006	23368.45	21895.31
339	268307.219	912605.994	1277.588	23386.04	21912.91
340	268306.844	912633.852	1277.371	23413.90	21940.78
341	268305.469	912670.996	1277.426	23451.04	21977.93
342	268305.688	912728.076	1277.262	23508.12	22035.02
343	268306.578	912779.611	1277.971	23559.65	22086.57
344	268303.969	912831.799	1278.516	23611.84	22138.77
345	268303.359	912886.793	1278.352	23666.83	22193.78
346	268300.969	912937.350	1279.441	23717.38	22244.34
347	268300.641	912988.164	1280.369	23768.20	22295.18
348	268299.734	913058.986	1280.805	23839.02	22366.02
349	268297.313	913126.232	1281.514	23906.26	22433.28
350	268296.750	913186.531	1282.441	23966.56	22493.59
351	268296.047	913248.520	1283.041	24028.55	22555.60
352	268296.531	913310.955	1284.131	24090.98	22618.05
353	268297.313	913383.400	1284.676	24163.43	22690.52
354	268296.609	913445.928	1284.621	24225.95	22753.06
355	268296.375	913504.379	1284.566	24284.40	22811.53
356	268297.437	913536.301	1284.676	24316.33	22843.46
357	268298.156	913552.578	1285.549	24332.61	22859.75
358	268299.953	913579.111	1286.039	24359.14	22886.29
359	268300.687	913586.180	1284.402	24366.21	22893.36
360	268300.562	913607.090	1285.002	24387.12	22914.27
361	268300.625	913643.215	1285.166	24423.25	22950.42
362	268300.438	913701.447	1285.656	24481.48	23008.66
363	268299.438	913758.027	1285.766	24538.06	23065.26
364	268300.016	913827.719	1286.365	24607.75	23134.97
365	268300.031	913890.547	1286.529	24670.58	23197.82
366	268299.625	913951.928	1286.857	24731.96	23259.21
367	268298.047	914022.014	1287.184	24802.04	23329.31
368	268298.094	914072.383	1288.057	24852.41	23379.70
369	268297.500	914142.600	1289.092	24922.63	23449.94
370	268299.094	914216.805	1289.473	24996.83	23524.16
371	268300.094	914309.119	1291.055	25089.15	23616.51
372	268300.016	914390.367	1291.709	25170.40	23697.78
373	268299.781	914481.371	1292.635	25261.40	23788.80
374	268299.625	914576.162	1294.434	25356.19	23883.62
375	268298.312	914664.168	1295.471	25444.19	23971.65
376	268297.812	914701.342	1296.561	25481.37	24008.84
377	268298.469	914734.469	1297.596	25514.50	24041.98
378	268299.125	914757.250	1297.596	25537.28	24064.76
379	268300.469	914774.809	1297.541	25554.84	24082.33
380	268300.516	914774.807	1294.289	25554.84	24082.33
381	268301.563	914806.187	1293.471	25586.22	24113.72
382	268302.828	914844.113	1294.289	25624.15	24151.66
383	268302.812	914845.252	1297.012	25625.29	24152.80
384	268303.172	914867.393	1297.338	25647.43	24174.95
385	268304.203	914888.537	1297.176	25668.57	24196.09
386	268306.609	914913.535	1296.467	25693.57	24221.10
387	268307.703	914952.820	1296.357	25732.86	24260.40
388	268307.828	915005.789	1295.977	25785.83	24313.38
389	268306.281	915071.865	1296.521	25851.90	24379.47
390	268305.328	915129.908	1297.557	25909.95	24437.54

WHITE TANKS WASH FLOOD INSURANCE STUDY REVISED 92/01/23
 SPOT POSITIONS AND ELEVATIONS
 ALONG DITCH WEST OF SUN VALLEY PARKWAY

POINT	EASTING	NORTHING	ELEV	DIST	STA
391	268305.297	915160.078	1297.721	25940.12	24467.72
392	268302.938	915197.096	1299.139	25977.13	24504.74
393	268303.078	915220.924	1299.900	26000.96	24528.58
394	268303.609	915264.670	1300.229	26044.70	24572.33
395	268302.547	915287.074	1300.174	26067.11	24594.75
396	268302.547	915287.129	1297.783	26067.16	24594.80
397	268303.234	915307.797	1297.184	26087.83	24615.47
398	268303.781	915323.920	1297.455	26103.95	24631.60
399	268304.109	915335.717	1297.893	26115.75	24643.40
400	268304.172	915337.664	1300.070	26117.70	24645.35
401	268305.062	915371.000	1299.688	26151.04	24678.70
402	268303.938	915415.613	1299.252	26195.65	24723.32
403	268303.891	915469.563	1299.143	26249.60	24777.29
404	268304.359	915534.543	1299.578	26314.58	24842.29
405	268304.625	915585.123	1299.633	26365.16	24892.88
406	268304.703	915634.896	1300.070	26414.93	24942.66
407	268304.203	915708.033	1300.451	26488.07	25015.83
408	268304.297	915789.385	1301.215	26569.42	25097.20
409	268301.922	915854.947	1302.141	26634.98	25162.78
410	268298.641	915917.777	1302.686	26697.80	25225.62
411	268298.281	915973.850	1303.123	26753.88	25281.71
412	268300.578	916047.760	1304.322	26827.79	25355.64
413	268302.016	916120.508	1304.486	26900.54	25428.41
414	268303.531	916182.311	1303.504	26962.34	25490.23
415	268303.125	916241.959	1304.432	27021.99	25549.90
416	268303.594	916297.027	1306.008	27077.06	25604.98
417	268303.469	916367.172	1307.098	27147.20	25675.14
418	268302.703	916447.250	1309.006	27227.28	25755.25
419	268303.141	916517.812	1310.260	27297.84	25825.83
420	268304.250	916554.227	1311.514	27334.26	25862.26
421	268304.609	916571.387	1312.168	27351.42	25879.42
422	268304.984	916603.926	1311.730	27383.96	25911.97
423	268304.141	916617.926	1311.568	27397.96	25925.98
424	268304.141	916617.926	1308.625	27397.96	25925.98
425	268304.859	916639.516	1308.680	27419.55	25947.57
426	268304.531	916665.793	1309.607	27445.83	25973.86
427	268304.562	916666.930	1312.813	27446.96	25974.99
428	268305.891	916706.805	1311.012	27486.84	26014.88
429	268307.125	916769.754	1310.141	27549.79	26077.85
430	268308.937	916822.883	1309.867	27602.92	26130.99
431	268310.219	916872.664	1310.357	27652.71	26180.80
432	268309.156	916933.957	1311.559	27714.00	26242.11
433	268308.203	916987.285	1312.863	27767.32	26295.44
434	268307.234	917035.039	1314.334	27815.08	26343.22
435	268306.766	917083.035	1314.986	27863.07	26391.22
436	268307.016	917090.496	1314.822	27870.53	26398.68
437	268307.031	917090.656	1313.459	27870.69	26398.84
438	268307.266	917097.742	1312.695	27877.78	26405.93
439	268307.594	917107.965	1313.188	27888.00	26416.16
440	268307.766	917113.051	1314.387	27893.09	26421.25
441	268308.687	917142.324	1313.568	27922.36	26450.53
442	268307.937	917190.117	1314.604	27970.16	26498.34
443	268306.469	917252.074	1314.932	28032.11	26560.31
444	268302.250	917309.570	1315.531	28089.60	26617.81
445	268300.469	917339.094	1316.186	28119.12	26647.34
446	268300.828	917366.383	1316.240	28146.41	26674.64
447	268304.187	917388.637	1316.240	28168.67	26696.91
448	268304.187	917388.852	1313.367	28168.88	26697.12
449	268304.688	917407.035	1315.221	28187.07	26715.31
450	268305.281	917444.445	1315.385	28224.48	26752.73
451	268306.125	917489.316	1315.438	28269.35	26797.62
452	268304.906	917513.512	1315.656	28293.55	26821.82
453	268303.062	917575.910	1316.117	28355.94	26884.23
454	268301.172	917667.254	1316.717	28447.28	26975.60
455	268301.125	917786.848	1317.152	28566.88	27095.23

WHITE TANKS WASH FLOOD INSURANCE STUDY REVISED 92/01/23
 SPOT POSITIONS AND ELEVATIONS
 ALONG DITCH WEST OF SUN VALLEY PARKWAY

POINT	EASTING	NORTHING	ELEV	DIST	STA
456	268301.578	917888.504	1317.861	28668.53	27196.91
457	268300.656	917985.313	1318.787	28765.34	27293.75
458	268302.328	918059.535	1319.006	28839.56	27367.99
459	268303.297	918185.461	1319.660	28965.49	27493.95
460	268304.234	918233.145	1319.660	29013.18	27541.66
461	268304.234	918233.145	1318.025	29013.18	27541.66
462	268305.203	918285.496	1318.080	29065.53	27594.02
463	268306.719	918364.609	1318.844	29144.64	27673.16
464	268306.203	918433.992	1319.553	29214.03	27742.57
465	268305.453	918553.090	1319.717	29333.12	27861.69
466	268302.453	918634.309	1320.697	29414.34	27942.93
467	268300.891	918735.883	1321.133	29515.91	28044.53
468	268298.359	918813.215	1321.133	29593.24	28121.88
469	268299.734	918906.992	1321.133	29687.02	28215.69
470	268297.641	919011.262	1321.242	29791.28	28319.98
471	268298.812	919114.605	1321.461	29894.63	28423.36
472	268296.906	919222.332	1322.879	30002.35	28531.11
473	268299.984	919316.266	1323.424	30096.29	28625.08
474	268302.500	919383.754	1322.879	30163.78	28692.59
475	268302.984	919383.723	1319.344	30163.75	28692.56
476	268303.328	919390.371	1320.217	30170.40	28699.21
477	268303.187	919404.273	1323.533	30184.30	28713.11
478	268301.000	919441.320	1323.533	30221.35	28750.17
479	268298.875	919510.703	1323.859	30290.73	28819.57
480	268297.828	919605.621	1324.568	30385.64	28914.51
481	268297.000	919689.566	1325.441	30469.59	28998.48
482	268296.703	919771.520	1325.932	30551.54	29080.46
483	268297.047	919824.887	1326.148	30604.91	29133.84
484	268298.812	919894.383	1327.131	30674.41	29203.36
485	268302.359	919911.832	1326.586	30691.86	29220.82
486	268302.297	919911.836	1322.836	30691.86	29220.82
487	268303.172	919928.488	1323.545	30708.52	29237.48
488	268302.125	919954.605	1326.760	30734.63	29263.60
489	268302.234	919991.332	1327.631	30771.36	29300.34
490	268300.641	920026.113	1327.850	30806.14	29335.13
491	268298.766	920045.559	1328.395	30825.58	29354.58
492	268297.391	920092.102	1329.867	30872.12	29401.13
493	268298.891	920147.398	1330.574	30927.42	29456.45
494	268298.859	920217.613	1331.883	30997.64	29526.69
495	268300.813	920300.227	1332.811	31080.25	29609.32
496	268303.750	920383.695	1333.791	31163.72	29692.81
497	268307.078	920454.656	1334.283	31234.69	29763.80
498	268308.953	920509.063	1335.645	31289.10	29818.23
499	268309.594	920572.285	1336.572	31352.32	29881.47
500	268308.969	920621.922	1336.518	31401.96	29931.12
501	268314.000	920675.352	1336.953	31455.40	29984.58
502	268319.062	920731.652	1337.063	31511.70	30040.89
503	268321.641	920757.359	1336.027	31537.42	30066.62
504	268324.516	920806.484	1337.172	31586.55	30115.76
505	268326.391	920837.883	1337.553	31617.95	30147.17
506	268326.828	920866.555	1337.498	31646.62	30175.85
507	268326.781	920866.559	1333.715	31646.63	30175.86
508	268327.812	920884.883	1333.551	31664.95	30194.19
509	268328.969	920904.117	1335.514	31684.19	30213.43
510	268328.859	920907.270	1338.219	31687.34	30216.58
511	268332.141	920963.910	1338.383	31743.99	30273.25
512	268334.328	921007.930	1339.363	31788.01	30317.28
513	268333.109	921053.484	1338.764	31833.56	30362.84
514	268335.406	921066.297	1336.529	31846.38	30375.67
515	268336.062	921083.070	1335.221	31863.16	30392.45
516	268336.672	921106.363	1336.584	31886.45	30415.75
517	268340.000	921170.922	1337.238	31951.02	30480.34
518	268342.016	921247.020	1338.982	32027.12	30556.46
519	268345.250	921326.234	1339.908	32106.34	30635.70
520	268346.578	921392.395	1340.400	32172.51	30701.89

WHITE TANKS WASH FLOOD INSURANCE STUDY REVISED 92/01/23
 SPOT POSITIONS AND ELEVATIONS
 ALONG DITCH WEST OF SUN VALLEY PARKWAY

POINT	EASTING	NORTHING	ELEV	DIST	STA
521	268349.250	921454.230	1341.381	32234.35	30763.75
522	268351.203	921480.414	1340.018	32260.54	30789.95
523	268351.219	921480.574	1335.729	32260.70	30790.11
524	268352.719	921502.555	1335.893	32282.68	30812.09
525	268353.641	921516.871	1337.420	32297.00	30826.42
526	268353.812	921520.004	1340.344	32300.14	30829.56
527	268356.547	921584.605	1340.344	32364.75	30894.19
528	268356.156	921661.469	1341.652	32441.61	30971.07
529	268357.250	921737.578	1341.869	32517.72	31047.20
530	268360.297	921808.289	1342.961	32588.44	31117.94
531	268363.391	921877.152	1343.506	32657.31	31186.83
532	268366.328	921910.535	1343.451	32690.70	31220.23
533	268366.594	921910.516	1340.465	32690.69	31220.22
534	268368.344	921923.309	1339.646	32703.48	31233.01
535	268368.812	921932.551	1340.736	32712.73	31242.27
536	268367.000	921934.629	1343.135	32714.80	31244.34
537	268368.391	921992.430	1342.918	32772.60	31302.15
538	268368.062	922062.070	1343.244	32842.24	31371.81
539	268368.672	922116.941	1343.518	32897.12	31426.71
540	268369.000	922175.023	1344.172	32955.20	31484.81
541	268368.547	922235.883	1344.717	33016.06	31545.68
542	268367.828	922310.105	1344.662	33090.28	31619.92
543	268367.781	922379.074	1344.826	33159.24	31688.90
544	268367.172	922430.500	1344.607	33210.67	31740.35
545	268366.109	922460.961	1345.371	33241.13	31770.82
546	268365.578	922500.703	1345.990	33280.87	31810.57
547	268362.953	922584.387	1346.098	33364.54	31894.26
548	268361.109	922684.516	1347.080	33464.66	31994.41
549	268359.141	922785.844	1347.297	33565.99	32095.77
550	268355.469	922878.285	1348.279	33658.42	32188.23
551	268352.328	922954.625	1348.824	33734.75	32264.58
552	268350.266	923046.523	1349.533	33826.64	32356.49
553	268349.187	923131.512	1350.188	33911.63	32441.51
554	268349.016	923189.629	1351.059	33969.74	32499.64
555	268351.078	923202.242	1350.951	33982.36	32512.26
556	268351.078	923202.242	1349.479	33982.36	32512.26
557	268351.828	923214.129	1350.242	33994.25	32524.15
558	268348.484	923255.918	1350.514	34036.03	32565.94
559	268344.172	923303.148	1350.732	34083.25	32613.18
560	268341.891	923363.586	1351.822	34143.68	32673.63
561	268336.844	923436.805	1353.295	34216.89	32746.86
562	268332.156	923512.711	1353.676	34292.78	32822.77
563	268328.766	923598.074	1354.658	34378.14	32908.15
564	268324.063	923652.441	1355.693	34432.50	32962.53
565	268324.047	923702.145	1356.674	34482.20	33012.24
566	268325.781	923742.609	1357.057	34522.67	33052.72
567	268325.828	923742.605	1353.459	34522.67	33052.72
568	268326.266	923748.922	1353.406	34528.98	33059.04
569	268327.047	923760.473	1356.895	34540.54	33070.60
570	268327.172	923790.148	1355.641	34570.21	33100.28
571	268323.016	923839.000	1355.586	34619.06	33149.14
572	268318.875	923918.176	1355.859	34698.22	33228.32
573	268318.891	923998.043	1356.404	34778.09	33308.22
574	268316.687	924051.582	1357.004	34831.63	33361.77
575	268312.078	924103.176	1358.094	34883.21	33413.37
576	268310.766	924142.875	1359.129	34922.91	33453.08
577	268310.203	924164.891	1359.510	34944.93	33475.10
578	268312.266	924168.871	1356.074	34948.91	33479.09
579	268312.906	924190.965	1355.039	34971.00	33501.18
580	268312.453	924213.078	1356.184	34993.12	33523.31
581	268309.969	924217.375	1359.885	34997.41	33527.60
582	268309.937	924263.770	1358.850	35043.80	33574.00
583	268305.828	924318.961	1359.395	35098.99	33629.21
584	268305.641	924386.961	1359.449	35166.99	33697.23
585	268308.062	924436.770	1358.250	35216.80	33747.05

WHITE TANKS WASH FLOOD INSURANCE STUDY REVISED 92/01/23
 SPOT POSITIONS AND ELEVATIONS
 ALONG DITCH WEST OF SUN VALLEY PARKWAY

POINT	EASTING	NORTHING	ELEV	DIST	STA
586	268308.813	924446.809	1357.486	35226.84	33757.09
587	268310.109	924452.148	1355.523	35232.18	33762.44
588	268310.297	924455.879	1355.959	35235.91	33766.17
589	268310.344	924462.770	1357.156	35242.80	33773.06
590	268311.484	924505.828	1357.156	35285.86	33816.13
591	268307.281	924594.504	1357.156	35374.53	33904.83
592	268305.562	924667.926	1357.266	35447.95	33978.27
593	268304.531	924771.852	1358.248	35551.88	34082.23
594	268305.906	924860.473	1358.629	35640.50	34170.87
595	268306.750	924949.730	1359.119	35729.76	34260.16
596	268307.797	925034.355	1360.102	35814.39	34344.81
597	268309.062	925119.566	1360.973	35899.60	34430.05
598	268310.328	925187.414	1361.736	35967.45	34497.92
599	268313.047	925270.086	1362.445	36050.12	34580.61
600	268314.750	925349.187	1363.426	36129.23	34659.74
601	268317.172	925430.793	1364.135	36210.84	34741.38
602	268316.531	925490.688	1364.789	36270.73	34801.28
603	268317.875	925551.637	1365.771	36331.68	34862.25
604	268319.125	925585.246	1366.697	36365.29	34895.87
605	268321.016	925611.922	1366.262	36391.97	34922.56
606	268321.141	925613.758	1362.846	36393.81	34924.40
607	268323.219	925645.793	1362.518	36425.85	34956.45
608	268325.016	925673.777	1364.209	36453.83	34984.44
609	268325.297	925680.270	1365.508	36460.33	34990.94
610	268327.531	925730.578	1365.127	36510.64	35041.26
611	268329.172	925772.789	1363.764	36552.85	35083.48
612	268326.719	925814.898	1364.363	36594.96	35125.61
613	268326.906	925898.664	1365.127	36678.72	35209.39
614	268329.406	925987.855	1365.672	36767.92	35298.62
615	268328.172	926070.578	1365.453	36850.64	35381.36
616	268326.750	926138.664	1365.291	36918.72	35449.46
617	268327.578	926215.168	1365.563	36995.23	35525.99
618	268328.156	926294.293	1365.891	37074.35	35605.13
619	268330.141	926362.309	1366.545	37142.37	35673.17
620	268334.172	926422.102	1366.926	37202.17	35732.99
621	268336.281	926451.473	1366.652	37231.55	35762.38
622	268336.703	926454.316	1363.605	37234.39	35765.22
623	268337.266	926462.527	1363.660	37242.60	35773.43
624	268337.625	926469.551	1366.600	37249.63	35780.46
625	268334.109	926514.340	1366.982	37294.41	35825.26
626	268335.328	926589.406	1366.600	37369.48	35900.35
627	268336.828	926661.687	1366.600	37441.76	35972.65
628	268339.594	926731.387	1366.764	37511.47	36042.38
629	268342.469	926771.230	1366.600	37551.32	36082.24
630	268342.531	926772.801	1362.637	37552.89	36083.81
631	268343.203	926782.785	1362.691	37562.87	36093.79
632	268342.641	926785.590	1367.799	37565.68	36096.60
633	268343.875	926818.879	1367.035	37598.97	36129.90
634	268343.812	926864.789	1367.471	37644.88	36175.83
635	268342.703	926943.109	1368.070	37723.20	36254.17
636	268346.141	927048.301	1369.105	37828.40	36359.40
637	268346.578	927095.422	1369.979	37875.52	36406.53
638	268347.156	927149.043	1369.488	37929.14	36460.17
639	268346.672	927241.211	1372.269	38021.31	36552.36
640	268347.375	927335.957	1372.923	38116.05	36647.13
641	268348.328	927417.395	1374.449	38197.49	36728.59
642	268350.672	927469.379	1375.267	38249.48	36780.60
643	268349.250	927490.750	1374.994	38270.85	36801.98
644	268350.891	927539.316	1375.759	38319.42	36850.56
645	268353.125	927628.313	1377.013	38408.42	36939.58
646	268354.875	927744.582	1378.866	38524.70	37055.90
647	268356.844	927832.129	1379.139	38612.25	37143.47
648	268360.094	927896.426	1379.029	38676.55	37207.79
649	268361.563	927917.000	1378.921	38697.13	37228.38
650	268362.781	927919.789	1377.176	38699.92	37231.17

WHITE TANKS WASH FLOOD INSURANCE STUDY REVISED 92/01/23
 SPOT POSITIONS AND ELEVATIONS
 ALONG DITCH WEST OF SUN VALLEY PARKWAY

POINT	EASTING	NORTHING	ELEV	DIST	STA
651	268362.938	927921.895	1377.667	38702.03	37233.28
652	268362.766	927925.160	1379.139	38705.29	37236.54
653	268363.297	927955.129	1379.248	38735.26	37266.52
654	268365.469	927992.527	1378.921	38772.67	37303.94
655	268365.875	927996.078	1376.633	38776.22	37307.49
656	268366.312	928002.609	1376.796	38782.75	37314.02
657	268366.797	928013.586	1379.735	38793.73	37325.01
658	268367.000	928033.434	1379.463	38813.58	37344.86
659	268366.781	928073.109	1379.517	38853.25	37384.54
660	268367.047	928118.562	1379.517	38898.71	37430.02
661	268367.969	928187.844	1379.408	38967.99	37499.31
662	268366.672	928260.973	1380.008	39041.12	37572.47
663	268366.500	928335.590	1381.044	39115.73	37647.10
664	268369.156	928435.570	1382.298	39215.72	37747.12
665	268373.906	928515.441	1383.333	39295.60	37827.02
666	268376.047	928586.648	1383.878	39366.82	37898.26
667	268377.969	928618.746	1384.314	39398.92	37930.37
668	268378.703	928631.230	1384.424	39411.40	37942.85
669	268378.719	928631.391	1381.708	39411.57	37943.02
670	268379.000	928636.309	1382.360	39416.48	37947.93
671	268378.797	928656.617	1383.772	39436.79	37968.25
672	268378.156	928712.437	1384.809	39492.61	38024.08
673	268379.453	928786.195	1387.039	39566.37	38097.87
674	268381.719	928879.098	1387.802	39659.28	38190.80
675	268387.234	928953.437	1388.347	39733.64	38265.18
676	268390.438	929026.738	1389.765	39806.95	38338.51
677	268388.422	929114.727	1390.527	39894.93	38426.52
678	268390.391	929185.074	1391.073	39965.28	38496.89
679	268392.406	929249.832	1392.218	40030.05	38561.68
680	268392.437	929324.168	1393.090	40104.38	38636.03
681	268391.516	929381.418	1394.181	40161.63	38693.30
682	268392.703	929407.656	1394.126	40187.87	38719.54
683	268396.641	929418.453	1393.254	40198.68	38730.36
684	268396.547	929448.953	1393.254	40229.18	38760.87
685	268395.062	929478.246	1393.689	40258.47	38790.16
686	268392.984	929495.645	1395.543	40275.86	38807.56
687	268393.484	929560.234	1396.470	40340.45	38872.17
688	268394.094	929624.109	1396.579	40404.33	38936.07
689	268396.906	929678.016	1396.089	40458.24	38989.99
690	268399.813	929702.180	1395.489	40482.42	39014.18
691	268397.375	929716.727	1394.943	40496.96	39028.72
692	268397.891	929724.234	1392.927	40504.46	39036.22
693	268399.187	929760.824	1392.927	40541.06	39072.83
694	268398.781	929793.246	1393.581	40573.48	39105.26
695	268398.484	929807.102	1394.828	40587.33	39119.12
696	268396.844	929824.633	1395.808	40604.86	39136.65
697	268400.750	929889.098	1396.625	40669.34	39201.15
698	268401.312	929941.906	1397.116	40722.15	39253.98
699	268402.062	930029.270	1397.988	40809.51	39341.36
700	268402.594	930074.539	1398.043	40854.78	39386.64
701	268400.172	930144.758	1399.787	40924.99	39456.87
702	268396.203	930213.125	1400.823	40993.35	39525.25
703	268392.734	930294.426	1402.459	41074.64	39606.57
704	268384.469	930364.824	1403.168	41145.01	39676.96
705	268381.234	930421.637	1404.203	41201.81	39733.77
706	268377.094	930497.773	1404.258	41277.94	39809.93
707	268373.266	930550.777	1404.095	41330.93	39862.93
708	268372.000	930597.527	1402.895	41377.68	39909.69
709	268370.156	930623.969	1402.895	41404.11	39936.13
710	268369.203	930653.930	1403.113	41434.07	39966.10
711	268367.297	930670.504	1402.622	41450.64	39982.67
712	268363.844	930696.402	1403.168	41476.53	40008.57
713	268360.094	930762.258	1403.931	41542.38	40074.44
714	268349.219	930836.687	1405.130	41616.78	40148.86
715	268338.328	930913.180	1406.221	41693.25	40225.35

WHITE TANKS WASH FLOOD INSURANCE STUDY REVISED 92/01/23
SPOT POSITIONS AND ELEVATIONS
ALONG DITCH WEST OF SUN VALLEY PARKWAY

POINT	EASTING	NORTHING	ELEV	DIST	STA
716	268329.719	930985.008	1406.493	41765.06	40297.18
717	268323.641	931026.496	1407.255	41806.54	40338.68
718	268316.687	931065.336	1408.290	41845.37	40377.52
719	268310.016	931124.066	1409.271	41904.09	40436.25
720	268307.375	931161.742	1409.218	41941.77	40473.95
721	268308.234	931191.957	1405.462	41971.98	40504.16
722	268301.937	931218.324	1403.718	41998.34	40530.53
723	268295.656	931242.410	1405.949	42022.42	40554.62
724	268286.875	931271.227	1407.854	42051.23	40583.44
725	268276.609	931307.633	1409.490	42087.64	40619.86
726	268264.984	931359.160	1410.471	42139.16	40671.39
727	268247.922	931437.324	1411.398	42217.33	40749.58
728	268230.594	931525.270	1412.271	42305.28	40837.56
729	268217.188	931583.211	1411.125	42363.23	40895.53

WHITE TANKS WASH FLOOD INSURANCE STUDY
 SPOT POSITIONS AND ELEVATIONS
 ALONG CENTERLINE OF SUN VALLEY PARKWAY

REVISED

92/01/23

POINT	EASTING	NORTHING	ELEV	DISTANCE	STA
1	268147.344	886658.594	1050.984	0	-1479.82
2	268165.953	886845.969	1053.705	188.30	-1291.47
3	268173.281	887021.250	1058.854	363.58	-1116.14
4	268179.781	887237.734	1066.180	580.05	-899.60
5	268187.656	887482.750	1074.916	825.14	-654.44
6	268190.297	887624.047	1081.096	966.41	-513.13
7	268193.406	887789.109	1085.602	1131.45	-348.05
8	268195.375	887982.641	1091.254	1324.92	-154.52
9	268198.203	888127.797	1092.127	1470.08	-9.32
10	268201.687	888283.562	1093.217	1625.88	146.53
11	268205.609	888466.281	1093.654	1808.63	329.33
12	268208.031	888653.328	1092.346	1995.66	516.41
13	268212.594	888918.453	1086.709	2260.80	781.63
14	268216.250	889209.578	1080.570	2551.91	1072.82
15	268217.297	889454.766	1077.309	2797.05	1318.03
16	268213.969	889713.891	1077.799	3056.02	1577.07
17	268209.219	889982.797	1079.746	3324.78	1845.91
18	268202.828	890327.328	1083.613	3669.15	2190.38
19	268195.000	890704.469	1086.641	4046.16	2567.50
20	268188.812	891058.297	1090.668	4399.90	2921.34
21	268183.391	891350.016	1093.924	4691.56	3213.08
22	268179.781	891574.297	1095.232	4915.81	3437.40
24	268177.984	891669.531	1096.359	5011.03	3532.64
25	268174.687	891826.313	1098.813	5167.79	3689.45
26	268172.219	892012.859	1099.793	5354.32	3876.03
27	268172.484	892178.875	1100.502	5520.34	4042.10
28	268172.281	892411.703	1102.684	5753.16	4274.99
29	268172.578	892646.703	1104.537	5988.16	4510.05
30	268171.766	892882.000	1106.875	6223.45	4745.41
31	268172.094	893112.422	1108.834	6453.88	4975.91
32	268171.828	893386.766	1111.662	6728.22	5250.32
33	268171.531	893649.000	1113.787	6990.45	5512.63
34	268171.297	893930.469	1115.914	7271.91	5794.17
35	268170.203	894241.422	1119.074	7582.86	6105.21
36	268169.781	894443.984	1121.578	7785.42	6307.83
37	268168.891	894679.562	1122.941	8021.00	6543.47
38	268169.828	894924.047	1125.123	8265.48	6788.02
39	268168.812	895199.953	1127.246	8541.39	7064.01
40	268168.781	895506.250	1129.748	8847.68	7370.39
41	268168.469	895751.672	1131.654	9093.10	7615.88
42	268168.281	896022.641	1134.379	9364.07	7886.93
43	268167.125	896267.937	1137.047	9609.36	8132.29
44	268167.000	896543.266	1139.660	9884.69	8407.70
45	268166.984	896815.859	1142.387	10157.28	8680.36
46	268166.281	897108.797	1144.727	10450.22	8973.39
47	268166.156	897193.547	1145.574	10534.97	9058.16
48	268166.203	897313.672	1147.428	10655.09	9178.32
49	268166.187	897414.250	1148.299	10755.67	9278.93
50	268168.312	897527.953	1149.063	10869.38	9392.67
51	268167.828	897695.609	1150.426	11037.03	9560.37
52	268169.906	897887.656	1151.625	11229.08	9752.47
53	268170.609	898096.391	1153.424	11437.82	9961.27
54	268171.500	898318.297	1155.875	11659.73	10183.24
55	268172.906	898577.766	1158.156	11919.20	10442.79
56	268174.328	898839.500	1160.174	12180.94	10704.60
57	268175.500	899118.047	1161.316	12459.48	10983.22
58	268176.781	899372.813	1163.824	12714.25	11238.07
59	268178.563	899629.109	1165.510	12970.55	11494.44
60	268180.094	899897.937	1167.729	13239.38	11763.35
61	268181.625	900136.375	1170.770	13477.82	12001.85
62	268183.562	900399.000	1174.146	13740.45	12264.56
63	268184.625	900639.344	1177.998	13980.80	12504.98
64	268186.797	900898.453	1182.408	14239.91	12764.16
65	268187.891	901114.359	1184.643	14455.82	12980.13
66	268189.297	901353.922	1186.930	14695.39	13219.77

WHITE TANKS WASH FLOOD INSURANCE STUDY
 SPOT POSITIONS AND ELEVATIONS
 ALONG CENTERLINE OF SUN VALLEY PARKWAY

REVISED

92/01/23

POINT	EASTING	NORTHING	ELEV	DISTANCE	STA
67	268191.141	901640.562	1189.209	14982.03	13506.49
68	268192.547	901859.922	1191.277	15201.40	13725.93
69	268194.125	902100.813	1193.021	15442.29	13966.89
70	268194.563	902161.121	1193.561	15502.60	14027.21
71	268195.844	902352.647	1194.434	15694.13	14218.80
72	268196.437	902500.059	1195.906	15841.54	14366.25
73	268197.875	902638.418	1196.232	15979.90	14504.65
74	268195.266	902853.658	1197.105	16195.13	14719.94
75	268191.734	903080.222	1197.268	16421.69	14946.57
76	268187.516	903373.279	1198.850	16714.73	15239.69
77	268184.547	903634.431	1201.629	16975.88	15500.92
78	268181.047	903836.850	1204.191	17178.29	15703.38
79	268178.109	904023.831	1207.789	17365.26	15890.41
80	268174.172	904304.648	1209.752	17646.07	16171.30
81	268170.000	904568.903	1210.514	17910.32	16435.62
82	268167.156	904767.631	1211.822	18109.05	16634.41
83	268165.047	904939.388	1213.949	18280.80	16806.21
84	268164.391	905083.948	1215.039	18425.36	16950.81
85	268164.688	905225.138	1217.656	18566.55	17092.04
86	268166.469	905353.206	1219.129	18694.62	17220.15
87	268168.937	905454.195	1219.184	18795.61	17321.17
88	268176.531	905633.833	1219.891	18975.26	17500.87
89	268185.672	905799.915	1220.383	19141.36	17667.01
90	268195.078	905974.112	1221.854	19315.58	17841.28
91	268205.875	906186.461	1223.926	19527.95	18053.71
92	268219.406	906440.621	1224.961	19782.16	18308.00
93	268229.812	906664.994	1226.705	20006.57	18532.47
94	268243.188	906915.206	1229.432	20256.84	18782.81
95	268253.625	907112.398	1231.230	20454.08	18980.11
96	268256.516	907163.926	1232.215	20505.62	19031.66
97	268261.469	907256.940	1232.705	20598.66	19124.73
98	268267.359	907378.058	1234.832	20719.81	19245.92
99	268275.281	907521.609	1237.064	20863.41	19389.56
100	268280.531	907645.300	1237.064	20987.13	19513.31
101	268284.625	907748.968	1237.719	21090.82	19617.03
102	268288.250	907842.182	1238.482	21184.06	19710.30
103	268290.687	907939.060	1238.756	21280.95	19807.22
104	268291.469	908012.216	1238.701	21354.11	19880.40
105	268292.750	908138.901	1239.465	21480.80	20007.12
106	268292.375	908271.268	1240.391	21613.16	20139.52
107	268292.031	908387.076	1241.154	21728.96	20255.35
108	268291.453	908535.201	1241.535	21877.08	20403.52
109	268290.969	908633.109	1242.080	21974.98	20501.44
110	268289.781	908750.695	1244.152	22092.56	20619.06
111	268289.078	908889.195	1246.332	22231.05	20757.59
112	268288.000	909025.613	1248.396	22367.46	20894.04
113	268285.969	909198.945	1250.195	22540.78	21067.41
114	268284.844	909345.006	1251.773	22686.83	21213.50
115	268284.062	909518.584	1253.246	22860.40	21387.12
116	268281.594	909695.287	1254.008	23037.08	21563.85
117	268280.859	909889.932	1256.189	23231.72	21758.54
118	268279.750	910063.162	1257.973	23404.94	21931.81
119	268278.906	910244.207	1259.986	23585.98	22112.91
120	268277.375	910429.029	1262.260	23770.79	22297.77
121	268276.500	910556.385	1263.678	23898.14	22425.15
122	268275.906	910675.760	1265.096	24017.51	22544.56
123	268275.000	910791.412	1266.186	24133.16	22660.24
124	268273.578	910924.816	1267.930	24266.55	22793.67
125	268272.391	911043.926	1269.402	24385.65	22912.80
126	268271.859	911177.834	1269.729	24519.56	23046.75
127	268270.281	911349.156	1270.547	24690.87	23218.11
128	268269.172	911549.396	1271.146	24891.10	23418.40
129	268267.250	911753.484	1272.838	25095.18	23622.54
130	268266.187	911964.121	1275.117	25305.81	23833.23
131	268265.000	912189.965	1277.242	25531.64	24059.12

WHITE TANKS WASH FLOOD INSURANCE STUDY
 SPOT POSITIONS AND ELEVATIONS
 ALONG CENTERLINE OF SUN VALLEY PARKWAY

REVISED

92/01/23

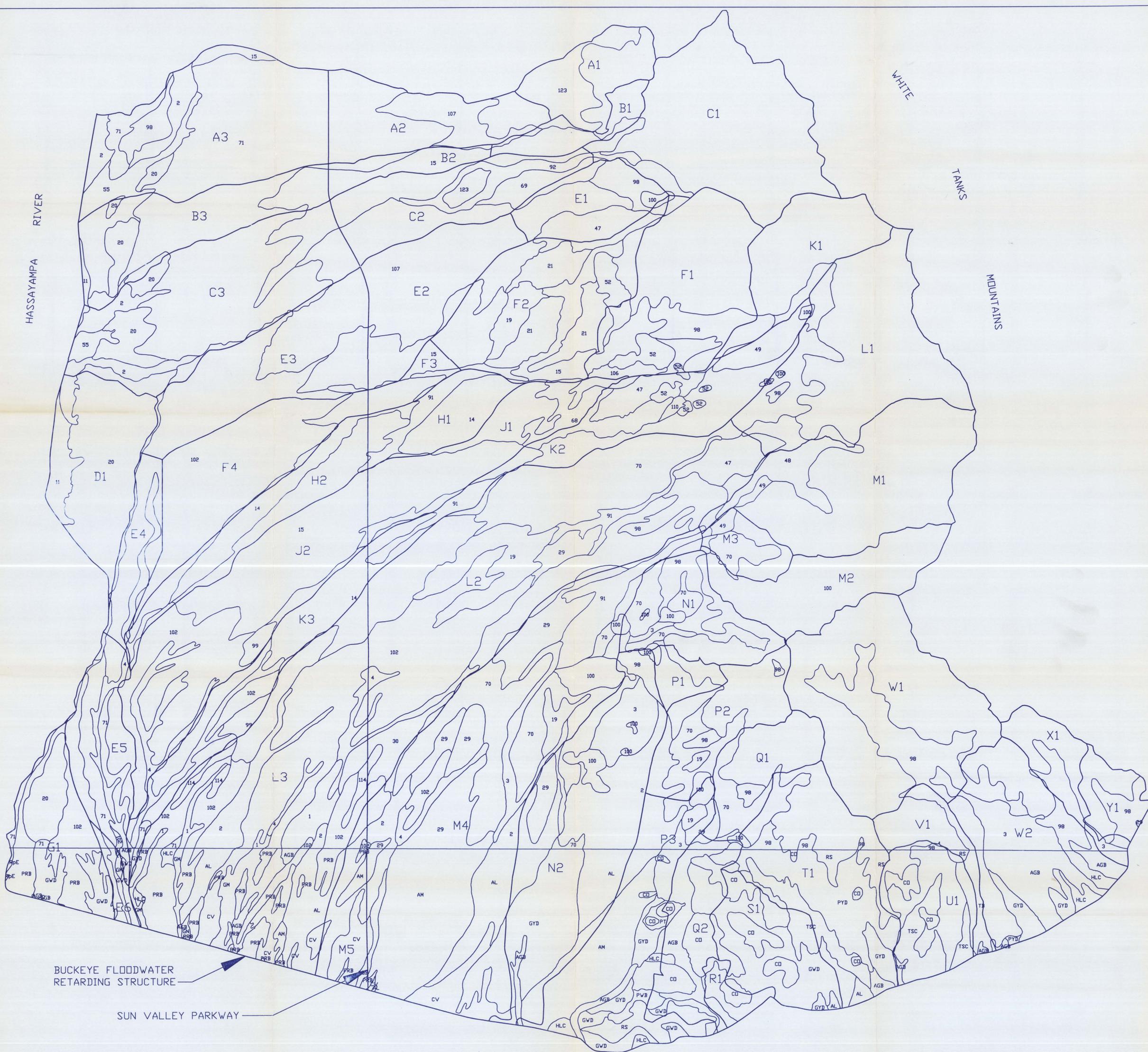
POINT	EASTING	NORTHING	ELEV	DISTANCE	STA
132	268262.187	912389.086	1279.314	25730.75	24258.29
133	268262.125	912550.385	1280.400	25892.05	24419.64
134	268261.641	912653.729	1281.291	25995.39	24523.00
135	268260.641	912775.143	1281.781	26116.79	24644.44
136	268258.969	912954.535	1282.871	26296.18	24823.88
137	268257.594	913218.197	1285.271	26559.83	25087.61
138	268257.719	913401.482	1287.178	26743.12	25270.95
139	268258.078	913597.600	1288.486	26939.23	25467.11
140	268257.906	913815.561	1289.086	27157.19	25685.14
141	268258.266	914078.891	1290.723	27420.52	25948.54
142	268258.922	914292.816	1293.656	27634.45	26162.53
143	268258.109	914464.922	1296.434	27806.55	26334.68
144	268258.125	914642.471	1297.906	27984.10	26512.28
145	268258.359	914786.920	1298.777	28128.55	26656.77
146	268258.047	914925.969	1299.486	28267.59	26795.85
147	268258.531	915077.932	1300.686	28419.56	26947.87
148	268258.562	915277.367	1301.613	28618.99	27147.36
149	268259.109	915424.295	1302.375	28765.92	27294.33
150	268258.594	915619.031	1303.793	28960.65	27489.11
151	268258.937	915814.984	1304.721	29156.60	27685.12
152	268258.578	915976.838	1305.646	29318.46	27847.03
153	268259.453	916127.113	1307.064	29468.73	27997.34
154	268259.922	916270.035	1308.699	29611.66	28140.31
155	268259.844	916448.777	1311.535	29790.40	28319.10
156	268259.672	916543.137	1313.061	29884.75	28413.48
157	268259.922	916634.883	1313.389	29976.50	28505.25
158	268259.547	916790.020	1314.969	30131.63	28660.43
159	268260.344	917076.297	1316.277	30417.91	28946.79
160	268260.969	917267.422	1317.313	30609.04	29137.97
161	268260.734	917367.738	1317.695	30709.35	29238.31
162	268260.750	917516.035	1318.240	30857.65	29386.66
163	268261.453	917603.840	1318.893	30945.46	29474.49
164	268260.766	917764.934	1319.547	31106.55	29635.63
165	268261.766	917952.176	1320.746	31293.79	29822.92
166	268261.828	918149.461	1322.217	31491.08	30020.27
167	268262.406	918332.879	1322.816	31674.49	30203.73
168	268262.516	918520.613	1322.709	31862.23	30391.52
169	268263.078	918753.895	1322.709	32095.51	30624.87
170	268261.469	918945.762	1322.816	32287.37	30816.78
171	268260.703	919185.648	1323.908	32527.25	31056.73
172	268260.016	919397.313	1325.270	32738.91	31268.45
173	268259.062	919627.496	1327.068	32969.09	31498.70
174	268258.422	919792.387	1328.922	33133.98	31663.64
175	268257.781	919937.414	1330.285	33279.00	31808.70
176	268259.328	920098.734	1331.920	33440.33	31970.07
177	268259.266	920223.105	1334.428	33564.70	32094.48
178	268262.156	920357.961	1336.223	33699.56	32229.38
179	268265.875	920474.855	1337.150	33816.47	32346.32
180	268269.781	920596.945	1338.240	33938.57	32468.46
181	268274.641	920734.707	1339.768	34076.35	32606.28
182	268280.359	920866.547	1340.639	34208.21	32738.17
183	268283.984	920968.637	1341.184	34310.32	32840.31
184	268288.297	921069.699	1341.566	34411.39	32941.41
185	268297.391	921267.344	1341.947	34609.08	33139.16
186	268304.156	921420.004	1343.691	34761.76	33291.88
187	268307.391	921514.145	1343.639	34855.92	33386.07
188	268313.500	921651.547	1343.584	34993.35	33523.54
189	268319.031	921786.766	1344.129	35128.59	33658.82
190	268321.031	921883.488	1344.400	35225.32	33755.57
191	268323.562	922040.891	1345.545	35382.74	33913.04
192	268324.797	922154.969	1346.254	35496.82	34027.15
193	268326.078	922278.270	1347.236	35620.12	34150.49
194	268326.625	922390.605	1347.236	35732.46	34262.86
195	268326.500	922462.344	1347.127	35804.20	34334.62
196	268324.719	922529.746	1347.695	35871.59	34402.03

WHITE TANKS WASH FLOOD INSURANCE STUDY
 SPOT POSITIONS AND ELEVATIONS
 ALONG CENTERLINE OF SUN VALLEY PARKWAY

REVISED

92/01/23

POINT	EASTING	NORTHING	ELEV	DISTANCE	STA
197	268323.344	922628.926	1347.914	35970.76	34501.23
198	268320.547	922776.215	1349.059	36118.04	34648.55
199	268317.516	922912.129	1349.822	36253.93	34784.48
200	268311.109	923069.977	1351.676	36411.75	34942.34
201	268305.344	923199.344	1353.475	36541.09	35071.72
202	268298.063	923343.527	1354.348	36685.24	35215.91
203	268291.453	923480.172	1354.729	36821.86	35352.57
204	268283.031	923650.691	1355.818	36992.35	35523.11
205	268277.563	923769.352	1357.617	37110.99	35641.78
206	268272.453	923899.273	1359.254	37240.89	35771.72
207	268267.078	924046.035	1359.963	37387.63	35918.50
208	268264.984	924177.324	1360.453	37518.91	36049.82
209	268261.859	924317.422	1360.889	37659.00	36189.95
210	268260.219	924456.113	1361.379	37797.69	36328.68
211	268259.047	924635.145	1360.508	37976.72	36507.76
212	268261.578	924847.617	1361.162	38189.19	36720.29
213	268266.109	925048.016	1362.252	38389.61	36920.77
214	268269.312	925235.375	1364.270	38576.97	37108.18
215	268272.437	925409.660	1365.904	38751.27	37282.53
216	268276.031	925609.203	1367.758	38950.82	37482.14
217	268279.531	925796.867	1368.357	39138.50	37669.87
218	268284.141	926030.250	1368.086	39371.89	37903.33
219	268287.156	926225.109	1367.703	39566.76	38098.26
220	268290.500	926388.422	1368.031	39730.09	38261.63
221	268293.500	926557.129	1368.467	39898.80	38430.39
222	268296.688	926676.066	1368.576	40017.75	38549.38
223	268298.969	926764.246	1368.740	40105.94	38637.59
224	268300.094	926914.199	1369.775	40255.89	38787.58
225	268303.047	927058.980	1370.756	40400.69	38932.42
226	268306.828	927234.902	1372.501	40576.62	39108.40
227	268308.562	927354.918	1374.900	40696.64	39228.46
228	268311.000	927484.980	1376.972	40826.71	39358.57
229	268312.859	927560.305	1377.789	40902.05	39433.93
230	268314.781	927678.348	1378.934	41020.10	39552.01
231	268317.891	927819.863	1380.079	41161.62	39693.57
232	268319.703	927913.988	1380.515	41255.75	39787.73
233	268321.922	927990.891	1380.787	41332.67	39864.67
234	268324.641	928120.652	1381.224	41462.44	39994.48
235	268327.078	928284.352	1382.750	41626.15	40158.24
236	268330.000	928420.074	1384.004	41761.88	40294.00
237	268332.484	928571.559	1386.021	41913.37	40445.54
238	268335.516	928748.566	1387.928	42090.39	40622.61
239	268338.750	928925.559	1390.599	42267.40	40799.67
240	268341.375	929034.008	1392.616	42375.86	40908.16
241	268343.453	929176.461	1394.143	42518.32	41050.66
242	268345.109	929307.930	1395.832	42649.79	41182.17
243	268346.187	929422.289	1397.195	42764.16	41296.57
244	268348.656	929592.660	1398.504	42934.54	41467.00
245	268350.719	929743.742	1398.722	43085.63	41618.13
246	268352.203	929917.219	1400.739	43259.11	41791.66
247	268350.047	930081.070	1402.753	43422.95	41955.55
248	268344.672	930230.383	1404.497	43572.24	42104.88
249	268339.047	930354.641	1405.043	43696.47	42229.15
250	268333.453	930460.070	1405.424	43801.87	42334.58
251	268321.141	930611.051	1406.569	43952.80	42485.55
252	268306.891	930762.270	1407.658	44103.96	42636.75
253	268292.781	930881.574	1408.963	44223.22	42756.05
254	268272.313	931034.523	1409.944	44376.10	42908.97
255	268247.344	931199.770	1410.707	44541.29	43074.21
256	268218.234	931363.887	1411.361	44705.35	43238.32
257	268196.031	931485.375	1412.070	44826.81	43359.81
258	268177.984	931570.875	1412.452	44912.29	43445.31



BUCKYEYE FLOODWATER
RETARDING STRUCTURE

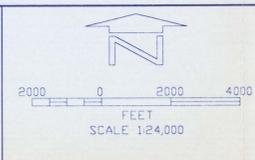
SUN VALLEY PARKWAY

CONTOUR INTERVALS

20'	40'
Wagner	White
Wash	Tank
Mts. SE	
Buttkeye	Valencia
NW	
10'	20'

INDEX MAP
USGS QUADRANGLES

□ = STUDY AREA



LEGEND

L2 DRAINAGE AREA DESIGNATION

— DRAINAGE AREA BOUNDARY

REVISIONS

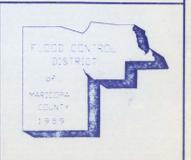
NO.	APP.	DATE	DESCRIPTION

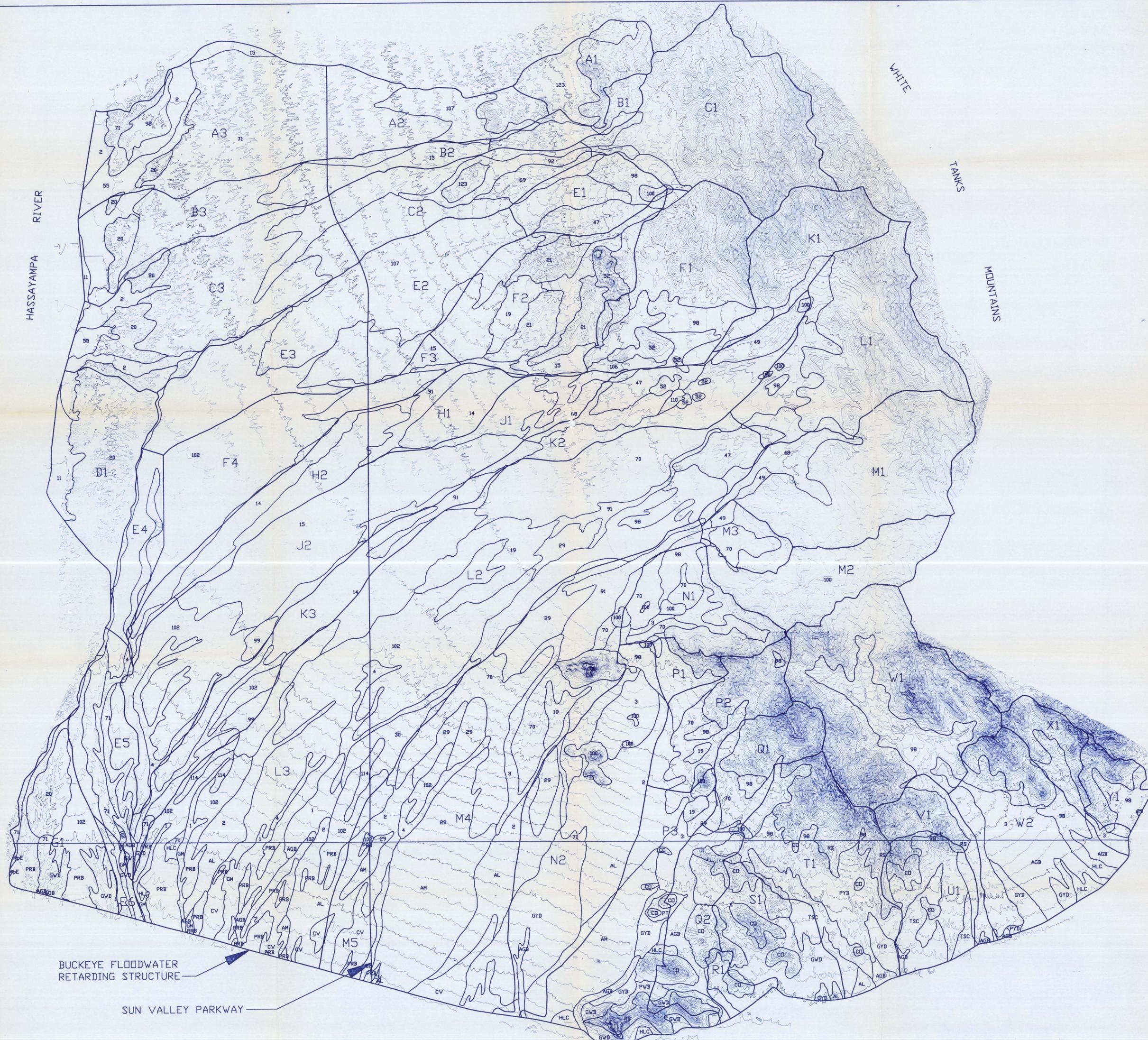
ALPHA Engineering Group, Inc.
2929 E. Camelback Rd. #215
Phoenix AZ 85016-4426

Design	J. BARR	5/93	SUBMITTED BY	DATE	SHEET
Design Chk.	T. CROCKER	10/93	RECOMMENDED BY	DATE	
Plans	J. PIKE	10/93		DATE	
Plans Chk.	J. BARR	10/93	SHOP ENGINEER AND GENERAL MANAGER	DATE	

WHITE TANKS WASH
FLOOD INSURANCE STUDY

BASINS & SOILS

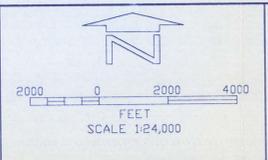




INDEX MAP
USGS QUADRANGLES

Wagner	White
Wash.	Tank
Well	Mrs. SE
Buckeye	Valencia
NW	

10' 20'



LEGEND

L2	DRAINAGE AREA DESIGNATION
—	DRAINAGE AREA BOUNDARY

REVISIONS

NO.	APP.	DATE	DESCRIPTION

ALPHA Engineering Group, Inc.
2929 E. Camelback Rd. #215
Phoenix AZ 85016-4426

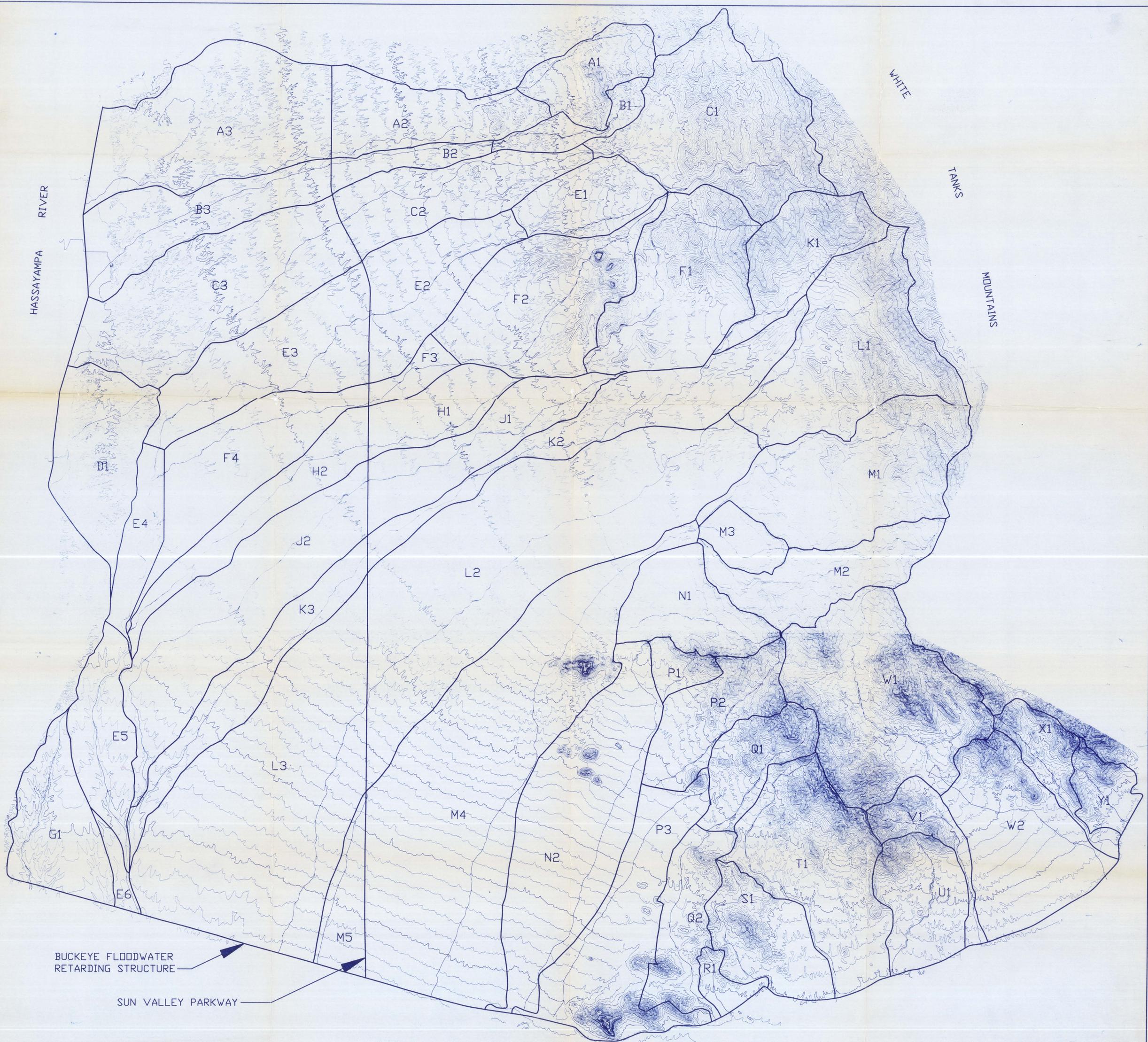
BY	DATE	SHEET
Design	J. BARR 6/93	
Design Chk.	T. CROCKER 10/93	
Plans	J. PIKE 10/93	
Plans Chk.	J. BARR 10/93	

RECOMMENDED BY: _____ DATE: _____
 CHECKED BY: _____ DATE: _____
 CHIEF ENGINEER AND GENERAL MANAGER OF: _____

**WHITE TANKS WASH
FLOOD INSURANCE STUDY**

BASINS, SOILS & TOPO



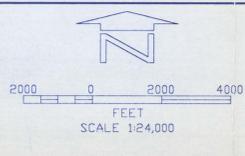


CONTOUR INTERVALS

20'	40'
Wagner Wash	White Tank Mts SE
Well Mts SE	Valencia
Buckeye NW	
10'	20'

INDEX MAP
USGS QUADRANGLES

= STUDY AREA



LEGEND

L2 DRAINAGE AREA DESIGNATION

DRAINAGE AREA BOUNDARY

REVISIONS

NO.	APP.	DATE	DESCRIPTION

ALPHA Engineering Group, Inc.
2929 E. Camelback Rd. #215
Phoenix AZ 85016-4426

DESIGN	BY	DATE	RECOMMENDED BY	DATE	SHEET
Design	J. BARR	6/93			
Design Chk.	T. CROCKER	10/93			
Plans	J. PIKE	10/93			
Plans Chk.	J. BARR	10/93			

CHEF ENGINEER AND GENERAL MANAGER

WHITE TANKS WASH
FLOOD INSURANCE STUDY

FLOW PATHS



NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

MARICOPA COUNTY,
ARIZONA AND
INCORPORATED AREAS

PANEL 1550 OF 4350

CONTAINS

COMMUNITY	NUMBER	PANEL	SUFFIX
MARICOPA COUNTY UNINCORPORATED AREAS	040037	1550	F

MAP NUMBER
04013C1550 F

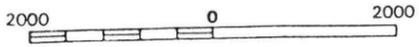
MAP REVISED:
DECEMBER 3, 1993



Federal Emergency Management Agency



APPROXIMATE SCALE IN FEET

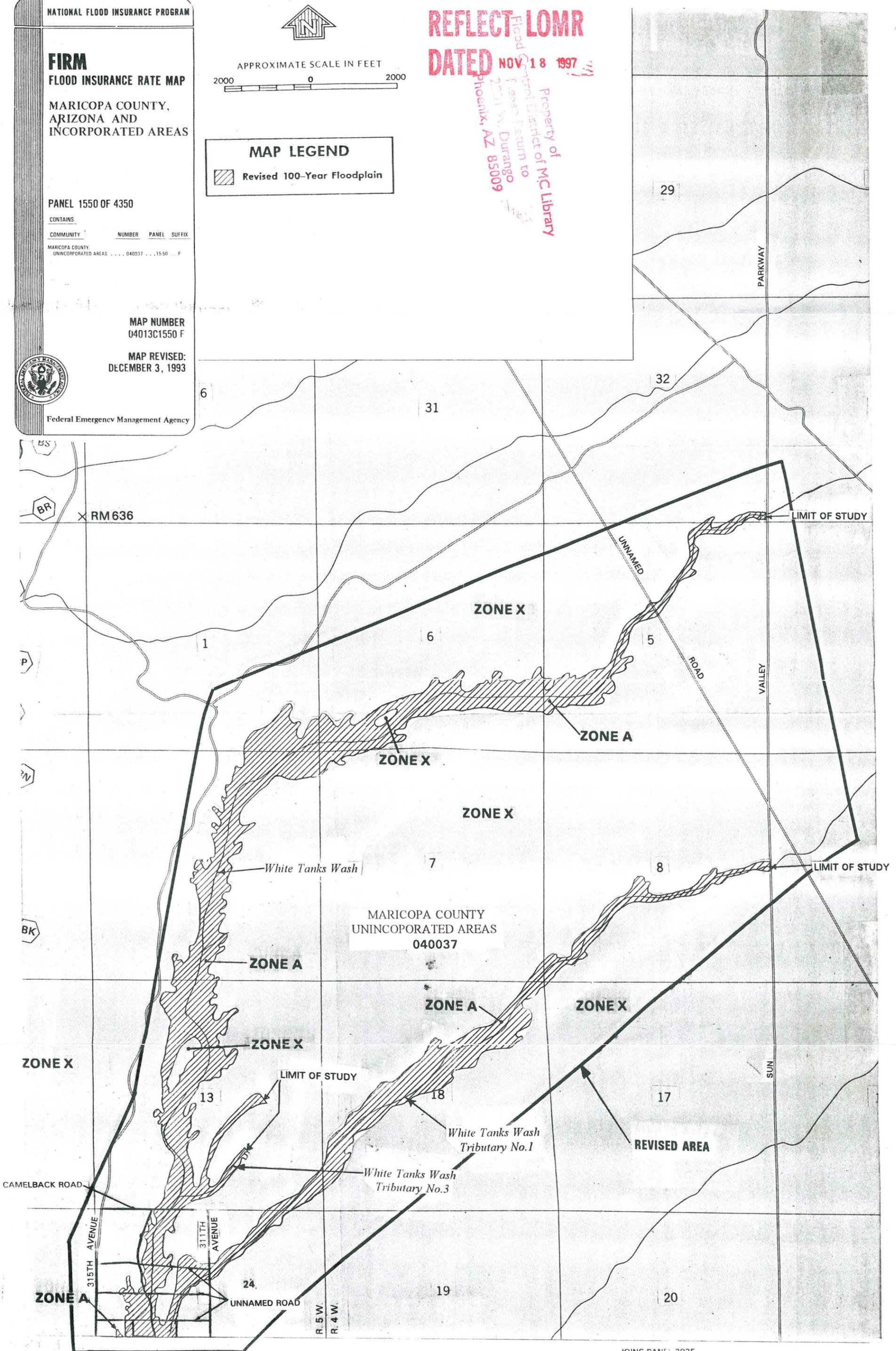


MAP LEGEND

Revised 100-Year Floodplain

**REVISED TO
REFLECT LOMR
DATED NOV 18 1997**

Property of MC Library
Flood Control District of
Pecos Return to
2551 N. Durango
Phoenix, AZ 85009



JOINS PANEL 2025

Table 3. Summary of Discharges (Cont'd)

<u>Flooding Source and Location</u>	<u>Drainage Area (Square Miles)</u>	<u>Peak Discharges (cfs)</u>			
		<u>10-Year</u>	<u>50-Year</u>	<u>100-Year</u>	<u>500-Year</u>
White Tanks Wash					
Just downstream of White Tanks Wash Tributary No. 1	13.83	--	--	6,208	--
Just upstream of White Tanks Wash Tributary No. 2	17.10	--	--	6,256	--
At Buckeye Flood Retarding Structure	29.50	--	--	7,209	--
White Tanks Wash Tributary No. 1					
At Sun Valley Parkway	1.06	--	--	603	--
At White Tanks Wash	1.42	--	--	818	--

REVISED TO
REFLECT LOMR
DATED NOV 18 1997

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 2.13 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and reviewing the form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden, to: Information Collections Management, Federal Emergency Management Agency, 500 C Street, S.W., Washington, DC 20472; and to the Office of Management and Budget, Paperwork Reduction Project (3067-0148), Washington, DC 20503.

1. OVERVIEW

1. The basis for this revision request is (are): *(check all that apply)*

- Physical change
 - Existing
 - Proposed
- Improved methodology
- Improved data
- Floodway revision
- Other Flood Insurance Study for Previously Unstudied Area

Explain _____

2. Flooding Source: White Tanks Wash and Tributaries

3. Project Name/Identifier: White Tanks Wash Flood Insurance Study

4. FEMA zone designations affected: x
 (example: A, AH, AO, A1-A30, A99, AE, V, V1-30, VE, B, C, D, X)

5. The NFIP map panel(s) affected for all impacted communities is (are):

Community No.	Community Name	County	State	Map No.	Panel No.	Effective Date
EX: 480301	Katy, City	Harris, Fort Bend	TX	480301	0005D	02/08/83
480287	Harris County	Harris	TX	48201C	0220G	09/28/90
040037	Maricopa County	Maricopa County	AZ	04013C	2025E	09/04/91
040039	Buckeye, Town	Maricopa County	AZ	04013C	2025E	09/04/91
040037	Maricopa County	Maricopa County	AZ	04013C	1550F	12/03/93
040039	Buckeye, Town	Maricopa County	AZ	04013C	1550F	12/03/93

6. The area of revision encompasses the following types of flooding, structures, and associated disciplines: *(check all that apply)*

Types of Flooding

- Riverine
- Coastal
- Alluvial Fan
- Shallow Flooding (e.g. Zones AO and AH)
- Lakes

Affected by wind/wave action

- Yes
- No

Structures

- Channelization
- Levee/Floodwall
- Bridge/Culvert
- Dam
- Coastal
- Fill
- Pump Station
- None
- Channel Relocation
- Excavation
- Other (describe)

Disciplines*

- Water Resources
 - Hydrology
 - Hydraulics
 - Sediment Transport
 - Interior Drainage
- Structural
- Geotechnical
- Land Surveying
- Other (describe)

Other (describe) _____

* Attach completed "Certification by Registered Professional Engineer and/or Land Surveyor" Form for each discipline checked. (Form 2)

2. FLOODWAY INFORMATION

7. Does the affected flooding source have a floodway designated on the effective FIRM or FBFM? Yes No

8. Does the revised floodway delineation differ from that shown on the effective FIRM or FBFM? Yes No

If yes, give reason: New Study

Attach copy of either a public notice distributed by the community stating the community's intent to revise the floodway or a statement by the community that it has notified all affected property owners and affected adjacent jurisdictions.

9. Does the State have jurisdiction over the floodway or its adoption by communities participating in the NFIP? Yes No

If yes, attach a copy of a letter notifying the appropriate State agency of the floodway revision and documentation of the approval of the revised floodway by the appropriate State agency.

3. PROPOSED ENCROACHMENTS

10. With floodways:

1A. Does the revision request involve fill, new construction, substantial improvement, or other development in the floodway? Yes No

1B. If yes, does the development cause the 100-year water surface elevation to increase at any location by more than 0.000 feet? Yes No

11. Without floodways:

2A. Does the revision request involve fill, new construction, substantial improvement, or other development in the 100-year floodplain? Yes No

2B. If yes, does the cumulative effect of all development that has occurred since the effective SFHA was originally identified cause the 100-year water surface elevation to increase at any location by more than one foot (or other surcharge limit if community or state has adopted more stringent criteria)? Yes No

If the answer to either Items 1B or 2B is yes, please provide documentation that all requirements of Section 65.12 of the NFIP regulations have been met, regarding evaluation of alternatives, notice to individual legal property owners, concurrence of CEO, and certification that no insurable structures are impacted.

4. REVISION REQUESTOR ACKNOWLEDGMENT

12. Having read NFIP Regulations, 44 CFR Ch. I, parts 59, 60, 61, and 72, I believe that the proposed revision is is not in compliance with the requirements of the aforementioned NFIP Regulations.

5. COMMUNITY OFFICIAL ACKNOWLEDGMENT

13. Was this revision request reviewed by the community for compliance with the community's adopted floodplain management ordinances? Yes No

14. Does this revision request have the endorsement of the community? Yes No

If no to either of the above questions, please explain: _____

Please note that community acknowledgment and /or notification is required for all requests as outlined in Section 65.4 (b) of the NFIP Regulations.

6. OPERATION AND MAINTENANCE

15. Does the physical change involve a flood control structure (e.g., levees, floodwalls, channelization, basins, dams)? Yes No

If yes, please provide the following information for each of the new flood control structures:

A. Inspection of the flood control project will be conducted periodically by _____ entity
_____ with a maximum interval of _____ months between inspections.

B. Based on the results of scheduled periodic inspections, appropriate maintenance of the flood control facilities will be conducted by _____ (entity)

to ensure the integrity and degree of flood protection of the structure.

C. A formal plan of operation, including documentation of the flood warning system, specific actions and assignments of responsibility by individual name or title, and provisions for testing the plan at intervals not less than one year, has has not been prepared for the flood control structure.

D. The community is willing to assume responsibility for performing overseeing compliance with the maintenance and operation plans of the N/A (Name)

flood control structure. If not performed promptly by an owner other than the community, the community will provide the necessary services without cost to the Federal government.

Attach operation and maintenance plans

7. REQUESTED RESPONSE FROM FEMA

16. After examining the pertinent NFIP regulations and reviewing the document entitled "Appeals, Revisions, and Amendments to Flood Insurance Maps: A guide for Community Officials," dated January 1990, this request is for a:

- a. CLOMR A letter from FEMA commenting on whether a proposed project, if built as proposed, would justify a map revision (LOMR or PMR), or proposed hydrology changes (see 44 CFR Ch. I, Parts 60, 65, and 72).
- b. LOMR A letter from FEMA officially revising the current NFIP map to show changes to floodplains, floodways, or flood elevations. LOMRs typically depict decreased flood hazards. (See 44 CFR Ch. I Parts 60 and 65.)
- c. PMR A reprinted NFIP map incorporating changes to floodplains, floodways, or flood elevations. Because of the time and cost involved to change, reprint, and redistribute an NFIP map, a PMR is usually processed when a revision reflects increased flood hazards or large-scope changes. (See 44 CFR Ch. I, Parts 60 and 65.)
- d. Other: Describe Physical Map Revision Based Upon New Flood Insurance Study

8. FORMS INCLUDED

7. Form 2 entitled, "Certification By Registered Professional Engineer and/or Land Surveyor" must be submitted.

The following forms should be included with this request if (check the included forms):

- Hydrologic analysis for flooding source differs from that used to develop FIRM Hydrologic Analysis Form (Form 3)
- Hydraulic analysis for riverine flooding differs from that used to develop FIRM Riverine Hydraulic Analysis Form (Form 4)
- The request is based on updated topographic information or a revised floodplain or floodway delineation is requested Riverine /Coastal Mapping Form (Form 5)
- The request involves any type of channel modification Channelization Form (Form 6)
- The request involves new bridge or culvert or revised analysis of an existing bridge or culvert Bridge/Culvert Form (Form 7)
- The request involves a new revised levee/floodwall system Levee/Floodwall System Analysis Form (Form 8)
- The request involves analysis of coastal flooding Coastal Analysis Form (Form 9)
- The request involves coastal structures credited as providing protection from the 100-year flood Coastal Structures (Form 10)
- The request involves an existing, proposed, or modified dam Dam Form (Form 11)
- The request involves structures credited as providing protection from the 100-year flood on an alluvial fan Alluvial Fan Flooding Form (Form 12)

9. INITIAL REVIEW FEE

18. The minimum initial review fee for the appropriate request category has been included. Yes No

Initial fee amount: \$ _____

Check or money order only. Make check or money order payable to : **National Flood Insurance Program.** If paying by Visa or Mastercard please refer to the credit card information form which follows this form.

or

19. This request is for a project that is for public benefit and is primarily intended for flood loss reduction to insurable structures in identified flood hazard areas which were in existence prior to the commencement of construction of the flood control project. Yes No

or

20. This request is to correct map errors, to include the effects of natural changes within the areas of special flood hazard, or solely to provide more detailed data. Yes No

Note: I understand that my signature indicates that all information submitted in support of this request is correct.

Signature of Revision Requester

Mark E. Forest, P.E., Associate Engineer

Printed Name and Title of Revision Requester

Harding Lawson Associates
Infrastructure, Inc.
Alpha Engineering Group

Company Name

(702) 329-6123

Telephone No.

1/31/96

Date

Note: Signature indicates that the community understands, from the revision requester, the impacts of the revision on flooding conditions in the community.

Signature of Community Official

Printed Name and Title of Community Official

Maricopa County

Community Name

Date

Does this request impact any other communities? Yes No

If yes, attach letters from all affected jurisdictions acknowledging revision request and approving changes to floodway, if applicable.

Note: Although a photograph of physical changes is not required, it may be helpful for FEMA's review.

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 2.13 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and reviewing the form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden, to: Information Collections Management, Federal Emergency Management Agency, 500 C Street, S.W., Washington, DC 20472; and to the Office of Management and Budget, Paperwork Reduction Project (3067-0148), Washington, DC 20503.

1. OVERVIEW

1. The basis for this revision request is (are): (check all that apply)

- Physical change
 - Existing
 - Proposed
- Improved methodology
- Improved data
- Floodway revision
- Other Flood Insurance Study for Previously Unstudied Area

Explain _____

2. Flooding Source: White Tanks Wash and Tributaries

3. Project Name/Identifier: White Tanks Wash Flood Insurance Study

4. FEMA zone designations affected: X

(example: A, AH, AO, A1-A30, A99, AE, V, V1-30, VE, B, C, D, X)

5. The NFIP map panel(s) affected for all impacted communities is (are):

Community No.	Community Name	County	State	Map No.	Panel No.	Effective Date
EX: 480301	Katy, City	Harris, Fort Bend	TX	480301	0005D	02/08/83
480287	Harris County	Harris	TX	48201C	0220G	09/28/90
040037	Maricopa County	Maricopa County	AZ	04013C	2025E	09/04/91
040039	Buckeye, Town	Maricopa County	AZ	04013C	2025E	09/04/91
040037	Maricopa County	Maricopa County	AZ	04013C	1550F	12/03/93
040039	Buckeye, Town	Maricopa County	AZ	04013C	1550F	12/03/93

6. The area of revision encompasses the following types of flooding, structures, and associated disciplines: (check all that apply)

- | | | |
|---|---|---|
| <p><u>Types of Flooding</u></p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Riverine <input type="checkbox"/> Coastal <input type="checkbox"/> Alluvial Fan <input type="checkbox"/> Shallow Flooding (e.g. Zones AO and AH) <input type="checkbox"/> Lakes <p>Affected by wind/wave action</p> <ul style="list-style-type: none"> <input type="checkbox"/> Yes <input type="checkbox"/> No | <p><u>Structures</u></p> <ul style="list-style-type: none"> <input type="checkbox"/> Channelization <input type="checkbox"/> Levee/Floodwall <input type="checkbox"/> Bridge/Culvert <input type="checkbox"/> Dam <input type="checkbox"/> Coastal <input type="checkbox"/> Fill <input type="checkbox"/> Pump Station <input type="checkbox"/> None <input type="checkbox"/> Channel Relocation <input type="checkbox"/> Excavation <input type="checkbox"/> Other (describe) | <p><u>Disciplines*</u></p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Water Resources <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Hydrology <input checked="" type="checkbox"/> Hydraulics <input type="checkbox"/> Sediment Transport <input type="checkbox"/> Interior Drainage <input type="checkbox"/> Structural <input type="checkbox"/> Geotechnical <input checked="" type="checkbox"/> Land Surveying <input type="checkbox"/> Other (describe) |
|---|---|---|

Other (describe) _____

* Attach completed "Certification by Registered Professional Engineer and/or Land Surveyor" Form for each discipline checked. (Form 2)

2. FLOODWAY INFORMATION

7. Does the affected flooding source have a floodway designated on the effective FIRM or FBFM? Yes No
8. Does the revised floodway delineation differ from that shown on the effective FIRM or FBFM? Yes No
- If yes, give reason: New Study

Attach copy of either a public notice distributed by the community stating the community's intent to revise the floodway or a statement by the community that it has notified all affected property owners and affected adjacent jurisdictions.

9. Does the State have jurisdiction over the floodway or its adoption by communities participating in the NFIP?

Yes No

If yes, attach a copy of a letter notifying the appropriate State agency of the floodway revision and documentation of the approval of the revised floodway by the appropriate State agency.

3. PROPOSED ENCROACHMENTS

10. With floodways:

1A. Does the revision request involve fill, new construction, substantial improvement, or other development in the floodway? Yes No

1B. If yes, does the development cause the 100-year water surface elevation to increase at any location by more than 0.000 feet? Yes No

11. Without floodways:

2A. Does the revision request involve fill, new construction, substantial improvement, or other development in the 100-year floodplain? Yes No

2B. If yes, does the cumulative effect of all development that has occurred since the effective SFHA was originally identified cause the 100-year water surface elevation to increase at any location by more than one foot (or other surcharge limit if community or state has adopted more stringent criteria)? Yes No

If the answer to either Items 1B or 2B is yes, please provide documentation that all requirements of Section 65.12 of the NFIP regulations have been met, regarding evaluation of alternatives, notice to individual legal property owners, concurrence of CEO, and certification that no insurable structures are impacted.

4. REVISION REQUESTOR ACKNOWLEDGMENT

12. Having read NFIP Regulations, 44 CFR Ch. I, parts 59, 60, 61, and 72, I believe that the proposed revision is is not in compliance with the requirements of the aforementioned NFIP Regulations.

5. COMMUNITY OFFICIAL ACKNOWLEDGMENT

13. Was this revision request reviewed by the community for compliance with the community's adopted floodplain management ordinances? Yes No

14. Does this revision request have the endorsement of the community? Yes No

If no to either of the above questions, please explain: _____

Please note that community acknowledgment and /or notification is required for all requests as outlined in Section 65.4 (b) of the NFIP Regulations.

6. OPERATION AND MAINTENANCE

15. Does the physical change involve a flood control structure (e.g., levees, floodwalls, channelization, basins, dams)? Yes No

If yes, please provide the following information for each of the new flood control structures:

A. Inspection of the flood control project will be conducted periodically by _____ entity
_____ with a maximum interval of _____ months between inspections.

B. Based on the results of scheduled periodic inspections, appropriate maintenance of the flood control facilities will be conducted by _____ (entity)
to ensure the integrity and degree of flood protection of the structure.

C. A formal plan of operation, including documentation of the flood warning system, specific actions and assignments of responsibility by individual name or title, and provisions for testing the plan at intervals not less than one year, has has not been prepared for the flood control structure.

D. The community is willing to assume responsibility for performing overseeing compliance with the maintenance and operation plans of the N/A (Name)

flood control structure. If not performed promptly by an owner other than the community, the community will provide the necessary services without cost to the Federal government.

Attach operation and maintenance plans

7. REQUESTED RESPONSE FROM FEMA

16. After examining the pertinent NFIP regulations and reviewing the document entitled "Appeals, Revisions, and Amendments to Flood Insurance Maps: A guide for Community Officials," dated January 1990, this request is for a:

- a. CLOMR A letter from FEMA commenting on whether a proposed project, if built as proposed, would justify a map revision (LOMR or PMR), or proposed hydrology changes (see 44 CFR Ch. I, Parts 60, 65, and 72).
- b. LOMR A letter from FEMA officially revising the current NFIP map to show changes to floodplains, floodways, or flood elevations. LOMRs typically depict decreased flood hazards. (See 44 CFR Ch. I Parts 60 and 65.)
- c. PMR A reprinted NFIP map incorporating changes to floodplains, floodways, or flood elevations. Because of the time and cost involved to change, reprint, and redistribute an NFIP map, a PMR is usually processed when a revision reflects increased flood hazards or large-scope changes. (See 44 CFR Ch. I, Parts 60 and 65.)
- d. Other: Describe Physical Map Revision Based Upon New Flood Insurance Study

8. FORMS INCLUDED

7. Form 2 entitled, "Certification By Registered Professional Engineer and/or Land Surveyor" must be submitted.

The following forms should be included with this request if (check the included forms):

- | | |
|---|---|
| <input type="checkbox"/> Hydrologic analysis for flooding source differs from that used to develop FIRM | <input checked="" type="checkbox"/> Hydrologic Analysis Form (Form 3) |
| <input type="checkbox"/> Hydraulic analysis for riverine flooding differs from that used to develop FIRM | <input checked="" type="checkbox"/> Riverine Hydraulic Analysis Form (Form 4) |
| <input type="checkbox"/> The request is based on updated topographic information or a revised floodplain or floodway delineation is requested | <input checked="" type="checkbox"/> Riverine /Coastal Mapping Form (Form 5) |
| <input type="checkbox"/> The request involves any type of channel modification | <input type="checkbox"/> Channelization Form (Form 6) |
| <input type="checkbox"/> The request involves new bridge or culvert or revised analysis of an existing bridge or culvert | <input type="checkbox"/> Bridge/Culvert Form (Form 7) |
| <input type="checkbox"/> The request involves a new revised levee/floodwall system | <input type="checkbox"/> Levee/Floodwall System Analysis Form (Form 8) |
| <input type="checkbox"/> The request involves analysis of coastal flooding | <input type="checkbox"/> Coastal Analysis Form (Form 9) |
| <input type="checkbox"/> The request involves coastal structures credited as providing protection from the 100-year flood | <input type="checkbox"/> Coastal Structures (Form 10) |
| <input type="checkbox"/> The request involves an existing, proposed, or modified dam | <input type="checkbox"/> Dam Form (Form 11) |
| <input type="checkbox"/> The request involves structures credited as providing protection from the 100-year flood on an alluvial fan | <input type="checkbox"/> Alluvial Fan Flooding Form (Form 12) |

9. INITIAL REVIEW FEE

18. The minimum initial review fee for the appropriate request category has been included. Yes No

Initial fee amount: \$ _____

Check or money order only. Make check or money order payable to : **National Flood Insurance Program.** If paying by Visa or Mastercard please refer to the credit card information form which follows this form.

or

19. This request is for a project that is for public benefit and is primarily intended for flood loss reduction to insurable structures in identified flood hazard areas which were in existence prior to the commencement of construction of the flood control project. Yes No

or

20. This request is to correct map errors, to include the effects of natural changes within the areas of special flood hazard, or solely to provide more detailed data. Yes No

Note: I understand that my signature indicates that all information submitted in support of this request is correct.

Signature of Revision Requester

Mark E. Forest, P.E., Associate Engineer

Printed Name and Title of Revision Requester

Harding Lawson Associates
Infrastructure, Inc.
Alpha Engineering Group

Company Name

(702) 329-6123

Telephone No.

1/31/96

Date

Note: Signature indicates that the community understands, from the revision requester, the impacts of the revision on flooding conditions in the community.

Signature of Community Official

Printed Name and Title of Community Official

Town of Buckeye

Community Name

Date

Does this request impact any other communities? Yes No

If yes, attach letters from all affected jurisdictions acknowledging revision request and approving changes to floodway, if applicable.

Note: Although a photograph of physical changes is not required, it may be helpful for FEMA's review.



Federal Emergency Management Agency

Washington, D.C. 20472

FLOOD CONTROL DISTRICT RECEIVED	
NOV 21 1997	
CHENG	P&PM
DEP	HYDRO
ADMIN	COST
FINANCE	FILE
GEO	
INS	
PLANS	

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

The Honorable James Baker
Mayor, Town of Buckeye
100 North Apache, Suite A
Buckeye, Arizona 85326

IN REPLY REFER TO:
Case No.: 97-09-404P

Community: Town of Buckeye, Arizona
Community No.: 040039
Panels Affected: 04013C1550 F and 2025 F
Effective Date of
This Revision: **NOV 18 1997**

102-I-C

Dear Mayor Baker:

This responds to a request that the Federal Emergency Management Agency (FEMA) revise the effective Flood Insurance Rate Map (FIRM) for Maricopa County, Arizona and Incorporated Areas (the effective FIRM for your community), in accordance with Part 65 of the National Flood Insurance Program (NFIP) regulations. In a letter dated January 23, 1997, Mr. Mark E. Forest, P.E., formerly with Harding Lawson Associates, requested that FEMA revise the FIRM to show the effects of detailed hydrologic and hydraulic analyses along the following reaches: White Tanks Wash from the Buckeye Flood Retarding Structure to Sun Valley Parkway, White Tanks Wash Tributary No. 1 from its confluence with White Tanks Wash to Sun Valley Parkway, White Tanks Wash Tributary No. 2 from its confluence with White Tanks Wash to approximately 14,400 feet upstream of the confluence, and White Tanks Wash Tributary No. 3 from its confluence with White Tanks Wash to approximately 2,200 feet upstream of the confluence.

All data required to complete our review of this request were submitted with letters from Mr. Forest. Because this Letter of Map Revision (LOMR) is based on a detailed hydrologic or hydraulic study conducted by a Federal, State, or local agency to replace an approximate study conducted by FEMA, fees were not assessed for the review.

We have completed our review of the submitted data and the flood data shown on the effective FIRM. We have revised the FIRM to add floodplain boundary delineations and zone designations of the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood) along White Tanks Wash, White Tanks Wash Tributary No. 1, White Tanks Wash Tributary No. 2, and White Tanks Wash Tributary No. 3. The modifications are shown on the enclosed annotated copies of FIRM Panel(s) 04013C1550 F and 04013C2025 F. This LOMR hereby revises the above-referenced panel(s) of the effective FIRM dated December 3, 1993, and September 30, 1995, respectively.

Because this revision request also affects the unincorporated areas of Maricopa County, a separate LOMR for that community was issued on the same date as this LOMR.

The modifications are effective as of the date shown above. The map panel(s) as listed above and as modified by this letter will be used for all flood insurance policies and renewals issued for your community.

A review of the determination made by this LOMR and any requests to alter this determination should be made within 30 days. Any request to alter the determination must be based on scientific or technical data.

The date for the next preliminary FIRM and Flood Insurance Study (FIS) report for Maricopa County, Arizona and Incorporated Areas is fall 1997. For informational purposes, detailed flood hazard data for White Tanks Wash and White Tanks Wash Tributary No. 1 have been shown on the enclosed annotated copies of the Summary of Discharges Table, Floodway Data Table, and Flood Profile Panel(s). This LOMR will not be included in the preliminary FIRM and FIS report; however, the modifications made by this LOMR and the detailed flood hazard data will be included in revised preliminary copies of the FIRM and FIS report. The revised preliminary copies are scheduled to be delivered for review within approximately 3 months.

This revision affects effective FIRM Panels 04013C1550 F and 04013C2025 F. These FIRM panels are currently shown at a scale of 2,000 feet per inch. When the effective FIRM is distributed, portions of FIRM Panel 04013C1550 F will be replaced by FIRM Panels 04013C1540 G and 04013C1545 G, and portions of FIRM Panel 04013C2025 F will be replaced by FIRM Panel 04013C2005 G. The new FIRM panels will be shown at a scale of 1,000 feet per inch.

This LOMR is based on minimum floodplain management criteria established under the NFIP. Your community is responsible for approving all floodplain development, and for ensuring all necessary permits required by Federal or State law have been received. State, county, and community officials, based on knowledge of local conditions and in the interest of safety, may set higher standards for construction in the Special Flood Hazard Area. If the State, county, or community has adopted more restrictive or comprehensive floodplain management criteria, these criteria take precedence over the minimum NFIP criteria.

Because this LOMR will not be printed and distributed to primary users, such as local insurance agents and mortgage lenders, your community will serve as a repository for these new data. We encourage you to disseminate the information reflected by this LOMR throughout the community, so that interested persons, such as property owners, local insurance agents, and mortgage lenders, may benefit from the information. We also encourage you to prepare a related article for publication in your community's local newspaper. This article should describe the changes that have been made and the assistance that officials of your community will give to interested persons by providing these data and interpreting the NFIP maps.

This determination has been made pursuant to Section 206 of the Flood Disaster Protection Act of 1973 (Public Law 93-234) and is in accordance with the National Flood Insurance Act of 1968, as amended (Title XIII of the Housing and Urban Development Act of 1968, Public Law 90-448), 42 U.S.C. 4001-4128, and 44 CFR Part 65. Pursuant to Section 1361 of the National Flood Insurance Act of 1968, as amended, communities participating in the NFIP are required to adopt and enforce floodplain management regulations that meet or exceed minimum NFIP criteria. These criteria are the minimum and do not supersede any State or local requirements of a more stringent nature. This includes adoption of the effective FIRM to which the regulations apply and the modifications made by this LOMR. Our records show that your community has met this requirement.

A Consultation Coordination Officer (CCO) has been designated to assist your community. The CCO will be the primary liaison between your community and FEMA. For information regarding your CCO, please contact:

Ms. Dorothy M. Lacey
Director, Mitigation Division
Federal Emergency Management Agency, Region IX
The Presidio of San Francisco, Building 105
San Francisco, California 94129-1250
(415) 923-7177

If you have any questions regarding floodplain management regulations for your community or the NFIP in general, please contact the CCO for your community at the telephone number cited above. If you have any technical questions regarding this LOMR, please contact Mr. John Magnotti of our staff in Washington, DC, either by telephone at (202) 646-3932 or by facsimile at (202) 646-4596.

Sincerely,



for Frederick H. Sharrocks, Jr., Chief
Hazard Identification Branch
Mitigation Directorate

Enclosure(s)

cc: The Honorable Don Stapley
Chairperson, Maricopa County Board
of Supervisors

Mr. Ron Nevitt ✓
Program Manager, NFIP
Flood Control District of Maricopa County

Mr. Richard T. Bagley
Planning Director
Town of Buckeye

Mr. Mark E. Forest, P.E.
Water Resources Consultants

Mr. Bruce A. Krater
Consulting Principal
Harding Lawson Associates

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	¹ DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY (FEET)	WITH FLOODWAY (FEET NGVD)	INCREASE
White Tanks Wash								
A	3,016	318	1,294	5.6	1,082.0	1,082.0	1,082.3	0.3
B	5,026	208	973	6.4	1,092.3	1,092.3	1,092.9	0.6
C	6,985	225	982	6.4	1,101.8	1,101.8	1,102.3	0.5
D	9,387	192	1,001	6.3	1,114.4	1,114.4	1,115.2	0.8
E	11,350	173	1,005	6.2	1,123.7	1,123.7	1,124.2	0.5
F	13,305	230	823	7.6	1,133.6	1,133.6	1,134.0	0.4
G	15,435	190	1,052	5.9	1,145.4	1,145.4	1,145.9	0.5
H	17,066	260	1,017	6.2	1,152.0	1,152.0	1,152.6	0.6
I	18,528	375	1,314	4.8	1,158.9	1,158.9	1,159.6	0.7
J	20,461	202	843	7.4	1,169.4	1,169.4	1,169.8	0.4
K	21,940	220	1,044	5.9	1,177.8	1,177.8	1,178.4	0.6
L	25,135	325	1,409	4.4	1,194.0	1,194.0	1,194.6	0.6
M	26,685	225	1,072	5.8	1,201.8	1,201.8	1,202.6	0.8
N	28,435	445	1,488	4.2	1,208.9	1,208.9	1,209.4	0.5
O	29,780	350	1,095	5.7	1,216.3	1,216.3	1,216.7	0.4
P	31,215	250	841	4.4	1,224.8	1,224.8	1,225.4	0.6
Q	33,060	216	794	4.3	1,234.8	1,234.8	1,235.6	0.8
R	35,160	297	710	4.4	1,247.1	1,247.1	1,247.6	0.5
S	37,565	311	740	3.7	1,264.1	1,264.1	1,264.6	0.5
T	39,530	175	500	5.5	1,279.4	1,279.4	1,279.9	0.5
U	41,145	320	661	3.2	1,292.8	1,292.8	1,293.4	0.6
V	43,390	189	409	5.2	1,311.3	1,311.3	1,312.2	0.9
W	44,400	144	317	3.9	1,319.3	1,319.3	1,319.7	0.4
X	46,360	172	221	4.1	1,339.6	1,339.6	1,339.8	0.2
Y	48,011	81	157	5.7	1,356.7	1,356.7	1,356.7	0.0
Z	50,246	80	135	6.5	1,385.2	1,385.2	1,385.2	0.0

¹ Feet Above Buckeye Flood Retarding Structure

REVISED TO
REFLECT LOMR
DATED NOV 18 1997

T
A
B
L
E
5

FEDERAL EMERGENCY MANAGEMENT AGENCY
MARICOPA COUNTY, AZ
AND INCORPORATED AREAS

FLOODWAY DATA

WHITE TANKS WASH

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	¹ DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY (FEET NGVD)	WITH FLOODWAY	INCREASE
White Tanks Wash Tributary No.1								
A	1,350	68	112	7.3	1,166.8	1,166.8	1,167.0	0.2
B	2,370	100	199	4.1	1,173.5	1,173.5	1,174.0	0.5
C	3,790	130	240	3.4	1,182.9	1,182.9	1,183.2	0.3
D	5,305	200	261	3.1	1,195.2	1,195.2	1,195.7	0.5
E	6,925	229	207	3.9	1,209.2	1,209.2	1,209.3	0.1
F	8,445	185	245	3.3	1,222.1	1,222.1	1,222.7	0.6
G	10,030	556	230	3.6	1,236.2	1,236.2	1,236.8	0.6
H	11,695	207	239	3.4	1,251.6	1,251.6	1,252.2	0.6
I	13,185	174	263	3.1	1,265.0	1,265.0	1,265.2	0.2
J	15,175	221	182	4.2	1,285.6	1,285.6	1,285.8	0.2
K	16,635	150	226	3.4	1,300.6	1,300.6	1,300.8	0.2
L	18,165	201	210	2.9	1,315.4	1,315.4	1,315.4	0.0
M	19,145	85	107	5.6	1,326.1	1,326.1	1,326.1	0.0
N	20,155	200	221	2.7	1,336.3	1,336.3	1,336.3	0.0

**REVISED TO
REFLECT LOMR
DATED NOV 18 1997**

¹ Feet Above Confluence With White Tanks Wash

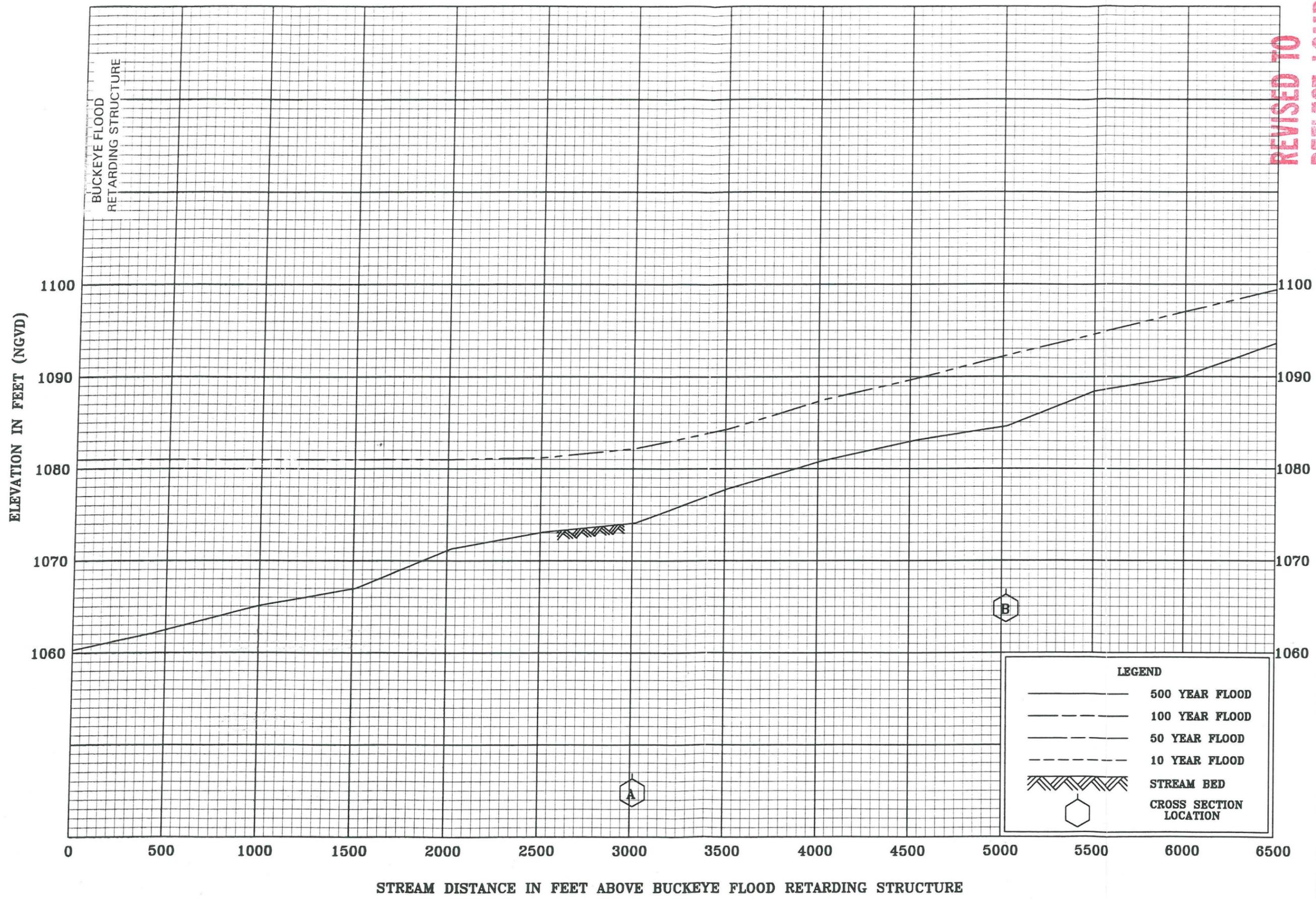
T
A
B
L
E
5

FEDERAL EMERGENCY MANAGEMENT AGENCY

MARICOPA COUNTY, AZ
AND INCORPORATED AREAS

FLOODWAY DATA

WHITE TANKS WASH TRIBUTARY NO.1



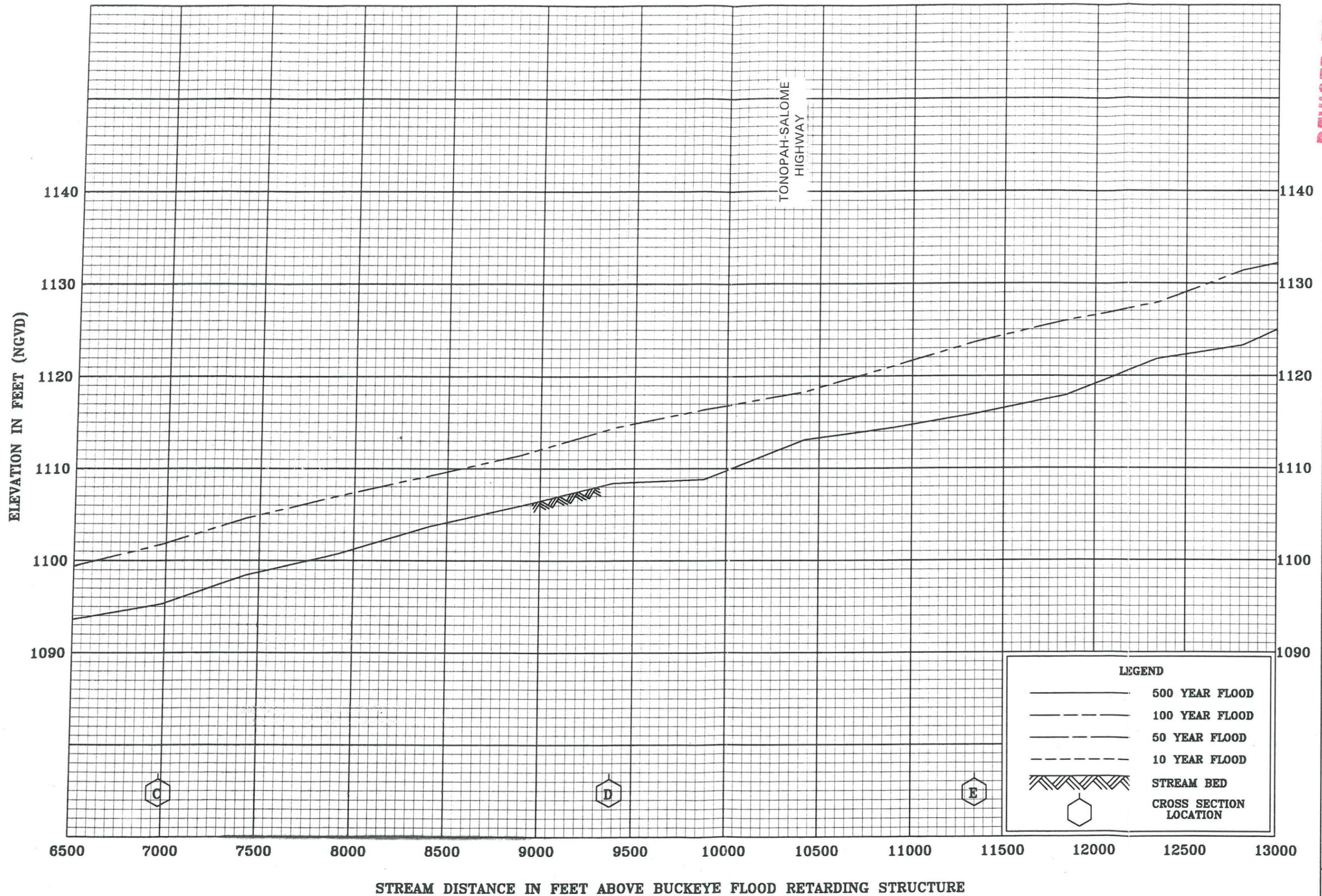
REVISED TO REFLECT LOWR DATED NOV 18 1997

FLOOD PROFILES

WHITE TANKS WASH

**FEDERAL EMERGENCY MANAGEMENT AGENCY
MARICOPA COUNTY, AZ
AND INCORPORATED AREAS**

1024P

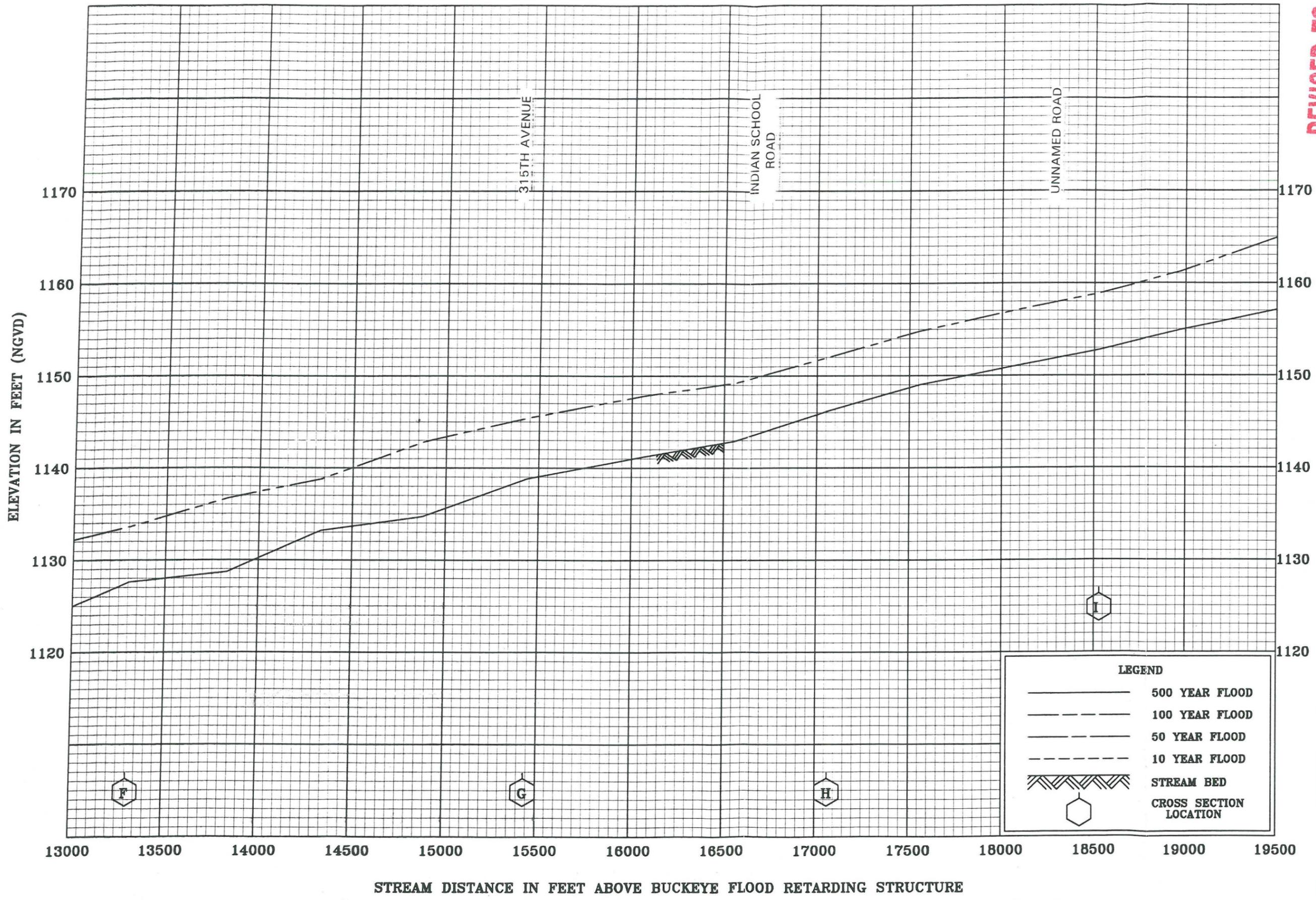


REVISED TO
 REFLECT LOMA
 DATA NOV 18 1997

FLOOD PROFILES
 WHITE TANKS WASH

FEDERAL EMERGENCY MANAGEMENT AGENCY
 MARICOPA COUNTY, AZ
 AND INCORPORATED AREAS

1025P



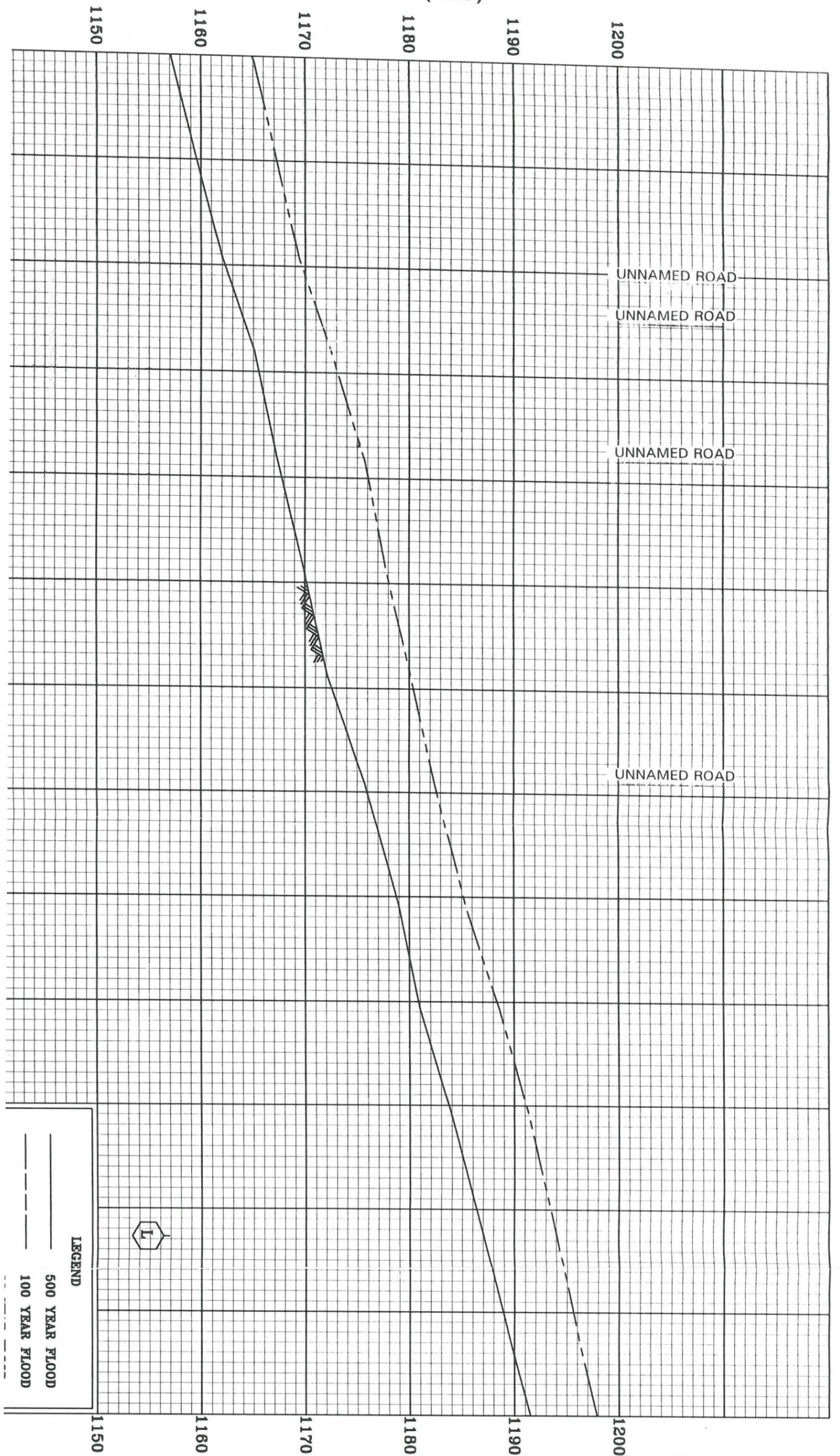
REVISED TO
REFLECT LOMR
DATED NOV 18 1997

FLOOD PROFILES
 WHITE TANKS WASH

FEDERAL EMERGENCY MANAGEMENT AGENCY
 MARICOPA COUNTY, AZ
 AND INCORPORATED AREAS

1026P

ELEVATION IN FEET (NGVD)



LEGEND
—— 500 YEAR FLOOD
- - - 100 YEAR FLOOD

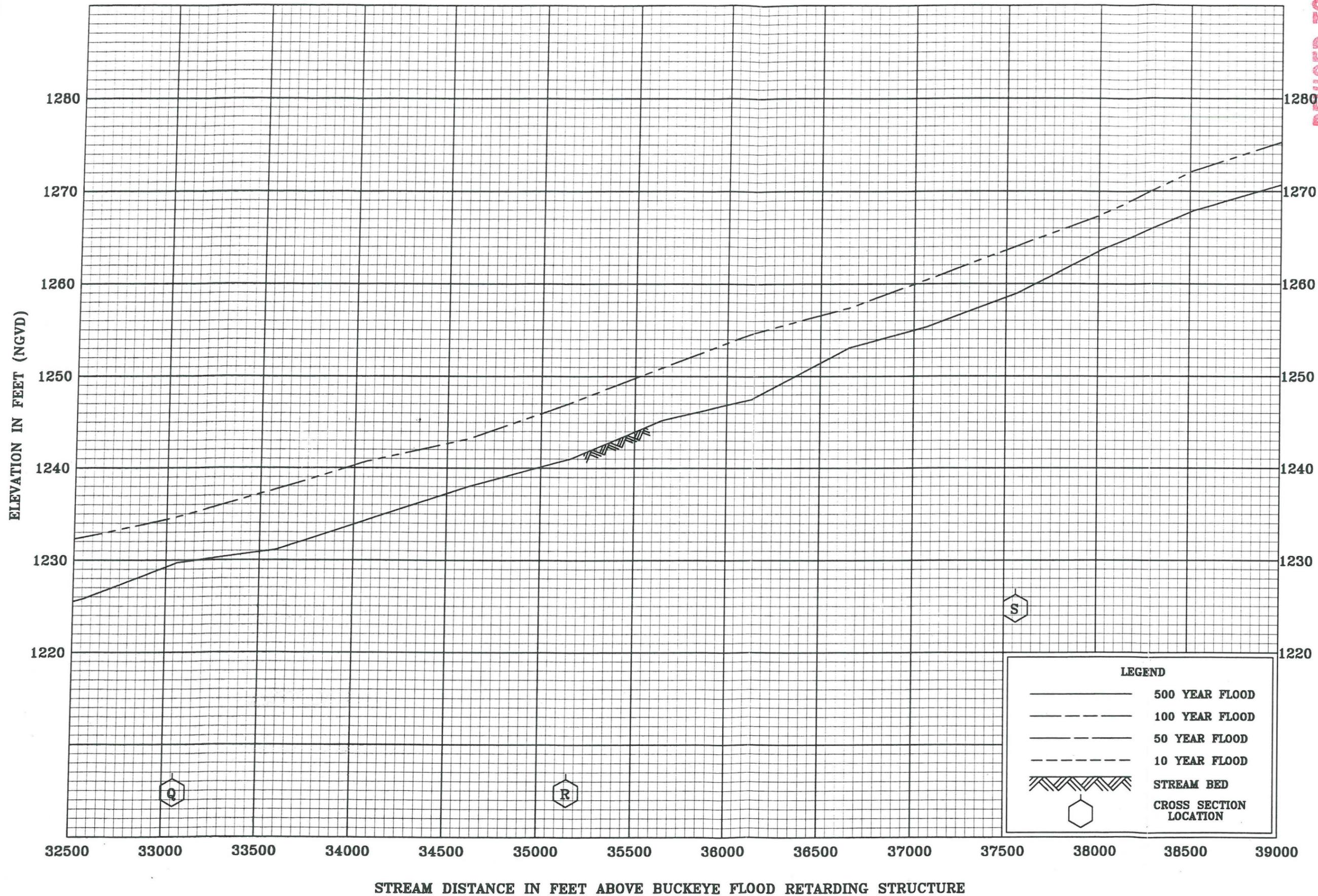
L

WATER RESOURCE MANAGEMENT AGENCY
PINAL COUNTY, AZ
INCORPORATED AREAS

FLOOD PROFILES

WHITE TANKS WASH

REVISED TO
REFLECT LOMR
DATED NOV 18 1997

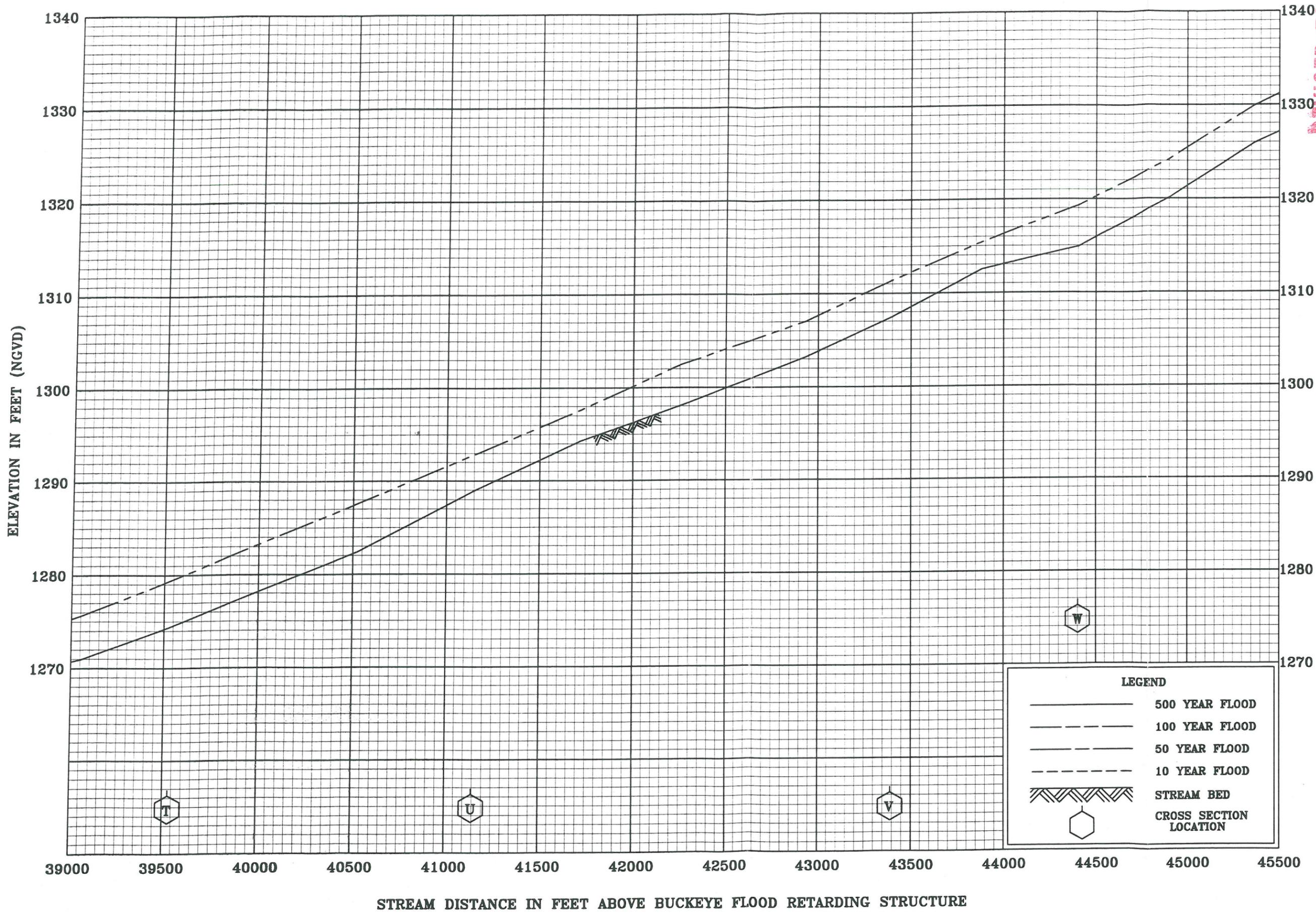


REVISED TO
REFLECT LOMR
DATED NOV 18 1997

FLOOD PROFILES
WHITE TANKS WASH

FEDERAL EMERGENCY MANAGEMENT AGENCY
MARICOPA COUNTY, AZ
AND INCORPORATED AREAS

1029P

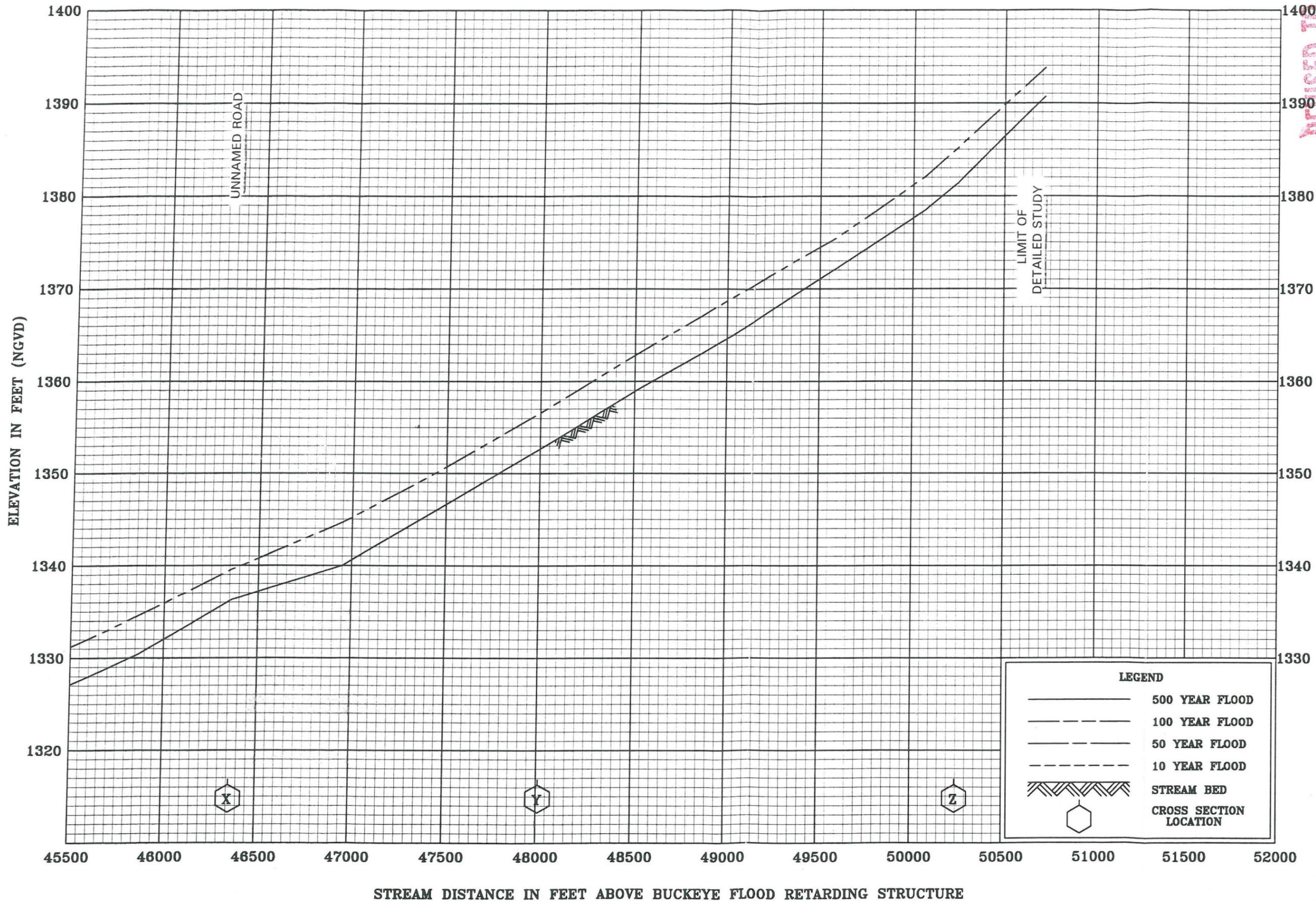


REVISED TO
 REFLECT LOWR
 DATED NOV 18 1997

FLOOD PROFILES
 WHITE TANKS WASH

FEDERAL EMERGENCY MANAGEMENT AGENCY
 MARICOPA COUNTY, AZ
 AND INCORPORATED AREAS

1030P



LEGEND

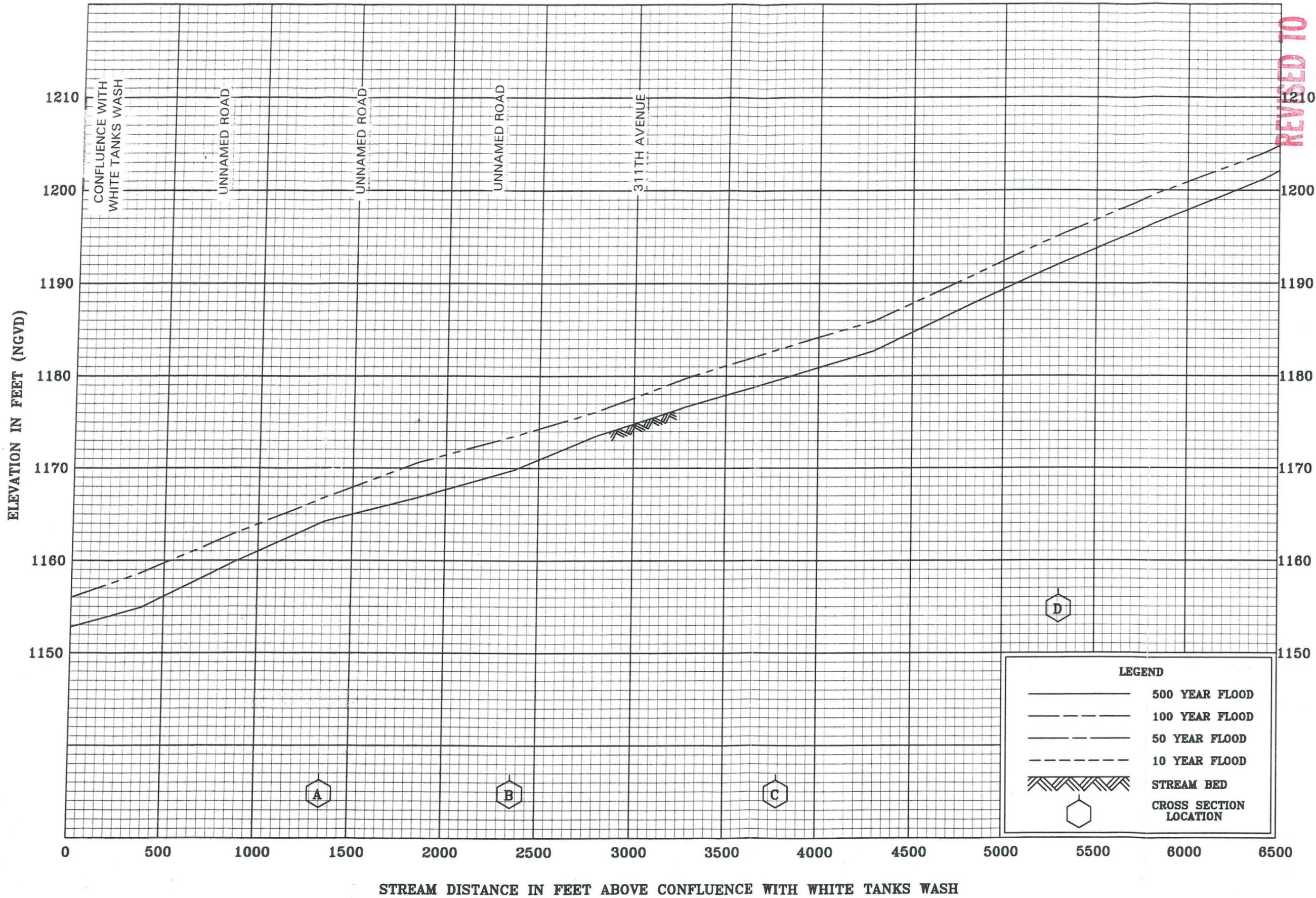
	500 YEAR FLOOD
	100 YEAR FLOOD
	50 YEAR FLOOD
	10 YEAR FLOOD
	STREAM BED
	CROSS SECTION LOCATION

REISED TO
 REFLECT LOMR
 DATED NOV 18 1991

FLOOD PROFILES
 WHITE TANKS WASH

FEDERAL EMERGENCY MANAGEMENT AGENCY
 MARICOPA COUNTY, AZ
 AND INCORPORATED AREAS

1031P



REVISED TO
 REFLECT LOMR
 DATED NOV 18 1997

FEDERAL EMERGENCY MANAGEMENT AGENCY
 UNINCORPORATED AREAS, AZ
 MARICOPA COUNTY

WHITE TANKS WASH TRIBUTARY NO. 1

FEDERAL EMERGENCY MANAGEMENT AGENCY
 UNINCORPORATED AREAS, AZ
 MARICOPA COUNTY

1032P

ELEVATION IN FEET (NGVD)

1340

1330

1320

1310

1340

1330

1320

1310

18000 18500 19000 19500 20000 20500

LIMIT OF
DETAILED STUDY

LEGEND

-  500 YEAR FLOOD
-  100 YEAR FLOOD
-  50 YEAR FLOOD
-  10 YEAR FLOOD
-  STREAM BED
-  CROSS SECTION LOCATION

STREAM DISTANCE IN FEET ABOVE CONFLUENCE WITH WHITE TANKS WASH

REVISED TO

REFLECT LOMR

DATED NOV 18 1997

FLOOD PROFILES

WHITE TANKS WASH TRIBUTARY NO. 1

FEDERAL EMERGENCY MANAGEMENT AGENCY

UNINCORPORATED AREAS, AZ

MARICOPA COUNTY

1035P