Skunk Creek
Watercourse Master Plan

ATTACHMENT 10
MONITORING & MAINTENANCE PLAN REPORT

ATTACHMENT 11
IMPLEMENTATION REPORT

Flood Control District of Maricopa County

AUGUST 2001

SKUNK CREEK WATERCOURSE MASTER PLAN

ATTACHMENT 10
MONITORING AND MAINTENANCE PLAN REPORT
DRAFT

10-1 Introduction

The recommended management plan for Phase 1 of the Skunk Creek Watercourse Master Plan (WCMP) is the Team Alternative. The Team Alternative achieved a total score of 39.8, as compared to scores of 26.6, 34.2, and 39.6 for the Full-Structural, Stakeholders, and Nonstructural Alternatives, respectively. This alternative achieved a total score of 20 and 19.8 out of a possible 25 points for Skunk Creek and Sonoran Wash, respectively. Although the margin is small over the Nonstructural Alternative, the Team Alternative is the most successful at meeting the WCMP goals. Key factors supporting the selection of the Team Alternative are that it allows use of private land within the FEMA 100-year floodplain without compromising public safety and it also meets the goals of the Sonoran Preserve Master Plan, and the North Black Canyon Corridor Plan. Selection of this alternative is also consistent with the alternatives analysis conducted by the COP (refer to Attachment 12- Alternatives Analysis Report, Section 12-7).

The recommended management plan for Phase 2 of the Skunk Creek WCMP is the Low-Impact Structural Alternative. The Low-Impact Structural Alternative achieved a total score of 20.3, as compared to scores of 11.8 and 19.9 for the Full-Structural and Nonstructural Alternatives, respectively. Although the margin is again small over the Nonstructural Alternative, the Low-Impact Structural Alternative is the most successful at meeting the WCMP goals. A key factor supporting the selection of the Low-Impact Alternative for Phase 2 of the study is the flexibility afforded to private landowners to reclaim land from the FEMA 100-year floodplain, while minimizing adverse impacts on the environment and the threat to public safety. Approximately 74 percent of the land in Phase 2 is privately owned.

This Monitoring and Maintenance Plan is developed for the purpose of providing recommendations for a systematic approach for monitoring and maintaining Skunk Creek and the Sonoran Wash in a manner that will attempt to preserve watercourse stability and design functionality for a minimum 60-year time period. The primary objective for development of the Monitoring and Maintenance Plan is to formulate simple monitoring and maintenance protocols that, if adopted by the District, should be easily accomplished and completed on an ordinary basis—as well as an extraordinary basis, if required—with minimal, straightforward field application. The monitoring plan is also intended to provide a historical database than can be used by the District for verification and adjustment of the procedures used for the lateral stability analyses. Should the District adopt these recommendations, the database may also be used for future watercourse research activities.

As described in the following sections, the Monitoring and Maintenance Plan consists of two primary elements: monitoring criteria and maintenance criteria. The monitoring

criteria are divided into short- and long-term and describe the circumstances that trigger inspections for each. The maintenance criteria describe the thresholds that, if met, indicate a maintenance action may be required. Actions or corrective measures that can be implemented as a response to inspection findings, in order to preserve channel stability and capacity, are also described. Recommended monitoring sites are described in detail and exhibits providing location and necessary baseline data are included for each site.

At the present time the WCMP remains only a plan and there is no way to predict when or if any of the recommendations will be implemented. The District may choose to adopt none or only a few of the monitoring and maintenance plan elements presented herein.

10-2 Monitoring Criteria

10-2.1 Short-term

As mentioned above, the monitoring criteria have been divided into short term and long-term elements. Short-term monitoring criteria are developed in order to identify significant watercourse changes typically developing over very short time periods (e.g., hours or a few days). Such rapid changes will generally be caused by single flood events of significant magnitude occurring on the Skunk Creek system. Accordingly, such changes will be the result of less frequent flows, such as those occurring on the order of once every 10 years, or more. Smaller flow events of longer duration might also create significant watercourse changes over a relatively short-term time period. Short-term monitoring of Skunk Creek is recommended to occur when:

- There is no reported flood damage, yet precipitation of 1.2 inches, or more, falls within the contributing watershed within a time period of one hour or less, or 2.0 inches of precipitation falls within 24 hours or less.
- Flood damage or disruption to transportation systems due to stormwater runoff (e.g., at wash crossings) has been reported.
- Specific hydraulic structures and/or stormwater detention/retention facilities located within the contributing watershed and along system watercourses have been reported either to have failed or been damaged.

The following features are recommended for monitoring over the short-term:

- Hydraulic structures, including bridges, culverts, drop structures, and overchutes
- Roadway dip crossings
- Bank protection/channel improvements
- Locations where structurally improved reaches, transition either into or out of nonstructural channel reaches.

10-2.2 Long-term

Long-term monitoring criteria are developed and recommended in order to identify significant watercourse changes typically occurring over much longer time periods. Such gradual changes will generally be caused by a series of smaller flood events that may occur over a period of as little as a few years to a period as long as several decades, in

combination with system-wide changes in watershed sediment continuity, initiated primarily by watershed urbanization and by man-made channel changes. Changes will likely occur in the form of gradual channel widening, channel degradation (i.e., a gradual lowering of the level of the streambed), or aggradation (i.e., a gradual raising of the level of the streambed—a condition that can potentially lead to system-wide channel widening or avulsions).

If the District chooses to adopt the program, long-term monitoring of Skunk Creek and Sonoran Wash is recommended to occur on a routine, programmatic basis, as follows:

- Field monitoring should occur on a biennial (i.e., once every two years) basis. The monitoring should occur preferably at the end of the summer monsoon season, around the beginning of October of each year.
- Aerial photography of the system watercourses should be performed on a biennial basis, and the watercourse main channels examined for long-term movement.
- Field survey of streambed profiles should occur every six years and be compared with historical profiles for the purpose of monitoring aggradation and degradation.
- Field survey of stream cross-sections should occur every six years at appropriate locations along the watercourses within the Skunk Creek system and be compared with historical cross sections for monitoring long-term main channel migration and widening.

The same features identified for short-term monitoring are also recommended for long-term monitoring.

10-3 Maintenance Criteria

The monitoring criteria described within the preceding sections establish the guidelines regarding when inspections are recommended over the short-term, the recommended long-term inspection frequency, and the typical features that should be monitored. The purpose of maintenance criteria is to provide easy-to-apply guidelines for ascertaining when maintenance is warranted and action should be considered. Accordingly, the criteria are based upon visual cues and changes in simple geometric parameters such as channel top width, channel bank height, horizontal bank location, and thalweg elevation and location. When changes are significant, maintenance should be considered to prevent or arrest the potential for localized or system-wide instabilities.

The need for maintenance, whether localized or system-wide, should be given serious consideration when the following criteria are met:

- Channel top-width along a channel segment has unexpectedly increased or decreased by 15%, or more, from its original, baseline configuration.
- Streambed elevation along a channel segment has unexpectedly lowered or has risen by 1.0 foot, or more, from its original, baseline configuration.
- Cracks or separations in joints are observed along channel linings.
- A low-flow thalweg has unexpectedly formed within or along a streambed that previously did not contain this hydraulic element.

SKUNK CREEK WATERCOURSE MASTER PLAN

ATTACHMENT 10

MONITORING AND MAINTENANCE PLAN REPORT

Prepared by:
Tetra Tech, Inc.
Infrastructure Southwest Group
4801 E. Washington St., Ste. 260
Phoenix, Arizona 85034-2004
(602) 682-3300

Project Number 2350.002.01

Prepared for:
Flood Control District of Maricopa County
2801 W. Durango Street
Phoenix, Arizona 85008
(602) 506-1501

Project FCD 99-23

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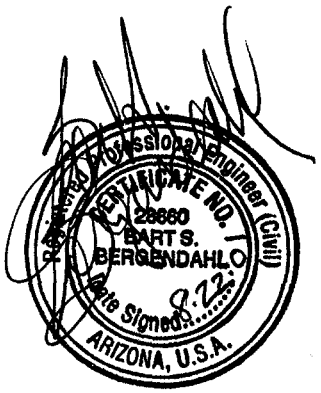

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- Loss of supporting soils is observed to occur immediately behind engineered embankments.
- Significant amounts of debris are observed within a channel system to the degree that hydraulic capacity might be unduly restricted.
- Unexpected sand and gravel bars are observed to form in locations that might unduly restrict hydraulic capacity or change the flow pattern.
- Sediment buildup is observed within hydraulic structures to the degree that 15%, or more, of the flow area is blocked.
- An unexpectedly large scour hole has formed in the immediate vicinity of a hydraulic structure (e.g., a bridge or culvert), which if left unchecked, might undermine the structure.

The above criteria have been written assuming all recommended structural and nonstructural elements have been implemented. These criteria represent a list of common indicators that maintenance may be required. Since potential watercourse instabilities can manifest themselves in a variety of ways, the above list should not be considered complete.

10-4 Maintenance Measures

When the findings from a site inspection indicate that one or more of the above maintenance criteria are met, maintenance measures should be considered in response to the change, regardless of whether it was identified through a short- or long-term monitoring effort. The identified change in the watercourse may be a localized phenomenon or it may be an indication of system-wide responses to changes in the sediment balance due to watershed urbanization or man-made channel changes. Detailed study of the watershed/watercourse may be necessary to identify the true cause and effect of the finding. Recommended responses to both localized and system-wide changes are identified below and summarized in Table 10-4.1.

10-4.1 Localized Changes

Maintenance measures that should be considered in any program in order to preclude or arrest localized changes on a short- or long-term basis include, but are not limited to:

- Removing sediment deposition from hydraulic structures, and at-grade stream crossings of roadways in order to restore hydraulic capacity.
- Filling areas where supporting soils have been lost immediately behind engineered embankments.
- Repairing cracks or separations in joints along channel linings.
- Where warranted, removing localized debris buildup from a channel system to preclude undue restriction of hydraulic capacity.
- Removing sediment buildup within hydraulic structures where 15%, or more, of the flow area is blocked to remove undue restriction of hydraulic capacity.
- Filling large scour holes formed in the immediate vicinity of hydraulic structures (e.g., a bridge or culvert) to preclude or arrest the potential for undermining.
- Horizontal extension of bank protection end-points to preclude outflanking of engineered embankments or fill.

- Vertical extension of toe protection to preclude undermining of engineered embankments or fill.

10-4.2 System-wide Changes

Maintenance measures that should be considered in order to preclude or arrest system-wide changes on a long-term basis include, but are not limited to:

- Construction of sediment and debris entrapment facilities to either reduce or eliminate downstream sedimentation problems.
- Construction of larger hydraulic structures to safely pass both sediment and water.
- Construction of grade control structures and ancillary guide-bank measures to reduce or eliminate long-term channel degradation.
- Construction of bank protection to reduce or eliminate long-term lateral channel migration.
- Construction of spur dikes to reduce or eliminate long-term channel widening.
- Horizontal extension of bank protection end-points to preclude outflanking engineered embankments or fill.
- Vertical extension of toe protection to preclude undermining engineered embankments or fill.

When the above measures require significant capital investment to implement, it is recommended that detailed engineering analyses be conducted up-front to confirm action is appropriate, and to fully define the extent of the action and the potential consequences to the watercourse system.

Table 10-4.1 Summary of Recommended Maintenance Actions

Inspection Finding	Recommended Action/s
Sediment/Debris Accumulation at Dip Crossing	Remove Sediment and/or Debris.
Sediment Accumulation 15% or more of Flow Area	Remove Sediment. *Construct Sediment Trap or Larger Hydraulic Structure
Debris Accumulation 15% or more of Flow Area	Remove Debris. *Construct Debris Trap or Larger Hydraulic Structure.
Local Scour Hole exposing Foundation or undermining Structure	Fill Scour Hole. *Extend Foundation or Construct Cutoff Wall/s.
Loss of Soil Support behind Bank Protection	Remove Bank Protection. Replace, Compact Embankment. Replace Bank Protection.
Joint Separation in Bank Protection	Close and seal joint.
Bank Protection Undermined	*Extend Bank Protection Downward.
Bank Protection Out-Flanked	*Extend Bank Protection Laterally.
Channel Width increased or decreased by 15% or more	*Construct Bank Protection or Spurs Dike.

Table 10-4.1 Summary of Recommended Maintenance Actions

Inspection Finding	Recommended Action/s
Bank Movement of 15% or more of channel width	*Construct Bank Protection.
Thalweg Movement of 15% or more of channel width	Compare Channel Capacity to Previous Survey.
Thalweg Elevation Increase of more than One Foot	*Construct Sediment Trap.
Thalweg Head-cut of more than One Foot	*Construct Grade Control Structure.

* Conduct detailed study to: confirm recommended action is appropriate, define scope of action, and identify consequences of action.

10-5 Monitoring Sites

Two specific sets of sites have been identified for monitoring potential system-wide changes due primarily to urbanization activities. The first set includes those sites that should be inspected when the criteria for short-term monitoring are satisfied. These sites are typically structural features, such as bridges, culverts, and bank protection, which have been constructed to facilitate transportation crossings or provide channel stability. The monitoring will typically involve a simple visual inspection along with photographs and possibly some measurements to document findings.

The second set includes the sites that should be inspected when the criteria for long-term monitoring are satisfied. These sites have been identified by the sediment transport, lateral migration, and scour analyses conducted for the master plan study as having a high potential for reflecting potential watercourse changes as manifested by channel aggradation, degradation, lateral migration, widening, or avulsion. Monitoring of these sites will typically require detailed measurements of specific channel parameters at fixed locations.

10-5.1 Short-term

The following sites should be monitored for short-term changes:

- Bridges over Skunk Creek at New River Road and Carefree Highway,
- CAP Canal overchute structures on Skunk Creek and Sonoran Wash,
- Culverts at Cloud Road and 27th Avenue,
- Roadway dip crossings at 19th Avenue, Desert Hills Road, Honda Bow Road, Circle Mountain Road, and Zorrillo Road,
- Bank protection improvements on the west bank of Skunk Creek in the Carefree Reach, and the west bank of Sonoran Wash in the Main Stem and Ironwood Reaches.

The location of each site is shown on Figure 10-5.1. The roadway bridges, culverts, and dip sections should be inspected for excessive local sediment deposition, significant scour, and large debris accumulations. Sediment or debris which blocks 15% or more of

the flow area is considered significant and should be removed. Local scour or erosion that exposes a foundation element or undermines any portion of a structure is also significant and should be addressed with further, detailed study. The bank protection should be inspected along its full length for loss of supporting soils, settlement, cracking, or separation. Photographs and any measurements needed to document the findings and the maintenance action should be taken and archived. Refer to Table 10-4.1 for recommended actions for specific inspection findings.

10-5.2 Long-term

As stated above, long-term monitoring sites will typically require detailed measurements of specific channel parameters at fixed locations. The location of each site is shown on Figure 10-5.2. The selected sites are addressed separately below. The primary parameters that should be monitored at each site are identified. A plan view showing the location and end-point coordinates (State Plane, NAD83) of the cross-section recommended for monitoring is included for each site. A thalweg profile plot, which extends approximately 500 feet upstream and downstream of the monitoring cross-section is provided as baseline data, along with a cross-section plot. Refer to Table 10-4.1 for recommended actions for specific inspection findings.

The following sites are recommended for long-term monitoring:

1. <u>New River Road Bridge over Skunk Creek</u>

This site has and is expected to continue experiencing significant aggradation both over the short-term and long-term. The deposited sediment adversely affects the channel conveyance capacity at the bridge. Consequently, sediment is being removed periodically by maintenance forces of the Maricopa County Department of Transportation (MCDOT). In addition to monitoring the site for aggradation, it is recommended that the quantity of sediment removed by MCDOT be recorded and archived. This site has been recommended for further detailed study to find a solution to the aggradation problem.

Figure 10-5.2.1a provides a plan view of the cross-section to be monitored, along with the coordinates for the recommended end points. Figures 10-5.2.1b and 1c provide the baseline cross-section and profile plots, respectively. The baseline data was developed from aerial photography taken in December 1995, and May 1996. The parameters that should be tracked are thalweg elevation and location, bank height and location, channel width, distance from low chord of the bridge to channel bottom, and channel capacity.

2. <u>West Overbank at New River Road Bridge</u>

The channel capacity of Skunk Creek is exceeded at approximately the 10-year event upstream of the New River Road crossing. Once the discharge exceeds the channel capacity at this location, a significant portion of the flow breaks out to the west, crossing New River Road. During the 100-year event more than half of the 7800 cfs is estimated to move across the west overbank area as relatively shallow flow. As this discharge is concentrated by small gullies that lead back to the main channel, there is a high potential

for headcutting through the west overbank area which can threaten private property. Therefore, it is recommended that a cross-section be established that will allow potential headcutting to be monitored over the long-term.

Figure 10-5.2.2a provides a plan view of the cross-section to be monitored, along with the coordinates for the recommended end points. Figures 10-5.2.2b and 2c provide the baseline cross-section and profile plots, respectively. The baseline data was developed from aerial photography taken in December 1995, and May, 1996. The parameters that should be tracked are thalweg elevation and location.

3. Confluence with Cline Creek

There is a high potential for sediment deposition immediately downstream of the confluence of Cline Creek with Skunk Creek. Significant aggradation during the more frequent flow events could cause loss of channel capacity and serious flooding and erosion problems on adjacent properties during the less frequent, high magnitude events. Therefore, it is recommended that a cross-section be established to allow the potential aggradation to be monitored over the long-term.

Figure 10-5.2.3a provides a plan view of the cross-section to be monitored, along with the coordinates for the recommended end points. Figures 10-5.2.3b and 3c provide the baseline cross-section and profile plots, respectively. The baseline data was developed from aerial photography taken in December 1995, and May, 1996. The parameters that should be tracked are thalweg elevation and location, bank height and location, channel width, and channel capacity.

4. Between Cline Creek and Honda Bow Road

There is concern that the main channel of Skunk Creek could migrate or avulse to the east side of the floodplain and effectively isolate existing residences within the floodway. To monitor this possibility, it is recommended that a cross-section be established for long-term monitoring. The level of concern over the potential avulsion would be reduced if these residences are purchased or relocated as part of the recommended buy-out program. However, the cross-section should be monitored, regardless of whether the buy-out program is implemented, in order to collect data necessary to evaluate channel responses to changes in the watershed. Refer to the Implementation Plan (Attachment 11) for a complete description of the recommended buy-out program.

Figure 10-5.2.4a provides a plan view of the cross-section location, along with the coordinates for the recommended end points. Figures 10-5.2.4b and 4c provide the baseline cross-section and profile plots, respectively. The baseline data was developed from aerial photography taken in December 1995, and May 1996. The parameters that should be tracked are thalweg elevation and location, bank location, and channel width.

5. Confluence with Rodger Creek

There is a high potential for sediment deposition immediately downstream of the confluence of Rodger Creek with Skunk Creek. Significant aggradation during the more

frequent flow events could cause loss of channel capacity and serious flooding and erosion problems on adjacent properties during the less frequent, high magnitude events. Therefore, it is recommended that a cross-section be established to allow the potential aggradation to be monitored over the long-term.

Figure 10-5.2.5a provides a plan view of the cross-section to be monitored, along with the coordinates for the recommended end points. Figures 10-5.2.5b and 5c provide the baseline cross-section and profile plots, respectively. The baseline data was developed from aerial photography taken in December 1986. The parameters that should be tracked are thalweg elevation and location, bank height and location, channel width, and channel capacity.

6. Upstream of Desert Hills Drive

There is concern that the main channel of Skunk Creek could migrate or avulse to the east side of the floodplain and effectively isolate existing residences within the floodway. To monitor this possibility, it is recommended that a cross-section be established for long-term monitoring. The level of concern would be reduced if these residences are purchased or relocated as part of the recommended buy-out program. However, the cross-section should be monitored, regardless of whether the buy-out program is implemented, in order to collect data necessary to evaluate channel responses to changes in the watershed. Refer to the Implementation Plan (Attachment 11) for a complete description of the recommended buy-out program.

Figure 10-5.2.6a provides a plan view of the cross-section to be monitored, along with the coordinates for the recommended end points. Figures 10-5.2.6b and 6c provide the baseline cross-section and profile plots, respectively. The baseline data was developed from **aerial photography taken in December 1986.** The parameters that should be tracked are thalweg elevation and location, bank location, and channel width.

7. Carefree Reach

A significant flow breakout to the west has been eliminated for the less frequent, higher discharge events in the Carefree Reach, as a result of fill and bank protection construction associated with the Tramonto Development. Consequently, larger discharges are now fully contained in the main channel. This could lead to degradation or, if there is sufficient armoring material, a tendency toward channel widening during the larger flow events. Such changes could attack the east bank or the bank protection constructed to protect the development. To track this potential, it is recommended that a cross-section be established for long-term monitoring.

Figure 10-5.2.7a provides a plan view of the cross-section to be monitored, along with the coordinates for the recommended end points. Figures 10-5.2.7b and 7c provide the baseline cross-section and profile plots, respectively. The baseline data was developed from aerial photography taken in December 1995, and May 1996. The parameters that should be tracked are thalweg elevation and location, bank height and location, and channel width.

8. Carefree Highway Bridge

The Carefree Highway Bridge is currently experiencing aggradation during the more frequent flow events. However, this may change during the high flow events due to the elimination of the breakout through the Tramonto area. Accordingly, it is recommended that a cross-section be established to monitor this location over the long-term. Figure 10-5.2.8a provides a plan view of the cross-section to be monitored, along with the coordinates for the recommended end points.

Figures 10-5.2.8b and 8c provide the baseline cross-section and profile plots, respectively. The baseline data was developed from aerial photography taken in December 1995, and May 1996. The parameters that should be tracked are thalweg elevation and location, distance from low chord of the bridge to channel bottom, and channel capacity through the bridge. When computing channel capacity through the bridge, special attention should be given to checking for roadway overflow on the east approach.

9. Upper Cutbank Reach

There is potential for the main channel of Skunk Creek to migrate or avulse to the east side of the floodplain in the upper portion of the Cutbank Reach. To monitor this possibility, it is recommended that a cross-section be established for long-term monitoring. Figure 10-5.2.9a provides a plan view of the cross-section to be monitored, along with the coordinates for the recommended end points. Figures 10-5.2.9b and 9c provide the baseline cross-section and profile plots, respectively. The baseline data was developed from aerial photography taken in December 1995, and May 1996. The parameters that should be tracked are thalweg elevation and location, bank height and location, and channel width.

10. CAP Canal

The embankment for the CAP Canal effectively acts as a roadway, crossing both Skunk Creek and Sonoran Wash at the downstream study limit. The overchute structures are gaps in the embankment that effectively act as a combination bridge opening and grade-control structure. For large discharges, these structural features produce a backwater or quasi-impoundment area immediately upstream of the CAP canal. This allows sediment, entrained in the flow, to drop out of suspension; thus, potentially reducing channel capacity and pushing more flow over Interstate Highway 17 to the west. To track the potential aggradation over the long-term, it is recommended that a monitoring cross-section be established.

Figure 10-5.2.10a provides a plan view of the cross-section to be monitored, along with the coordinates for the recommended end points. Figures 10-5.2.10b and 10c provide the baseline cross-section and profile plots, respectively. The baseline data was developed from aerial photography taken in December 1995, and May 1996. The parameters that should be tracked are thalweg elevation and location, bank location, channel width, and channel capacity.

10-6 Summary and Conclusions

The Monitoring and Maintenance Plan described herein provides a means of identifying significant changes at specific locations along the study watercourses. The Plan offers appropriate responses to those changes. The responses are formulated in an attempt to minimize property damage and threats to public safety over a 60-year time period. The Plan also offers side benefits. They include providing a technical database that can be used to potentially link changes in the watercourses to maintenance activities or to changes in the watershed. The data collected through implementation of the Plan can also be used to augment existing databases and, thereby, enhance the existing knowledge of the specific watercourses and watershed. The data can also provide technical information for future general research needs in the area of watercourse response to natural changes, as well as watershed development.

In conclusion, the recommended Monitoring and Maintenance Plan, described herein, is an integral part of the recommended WCMP management alternative and should be implemented accordingly.

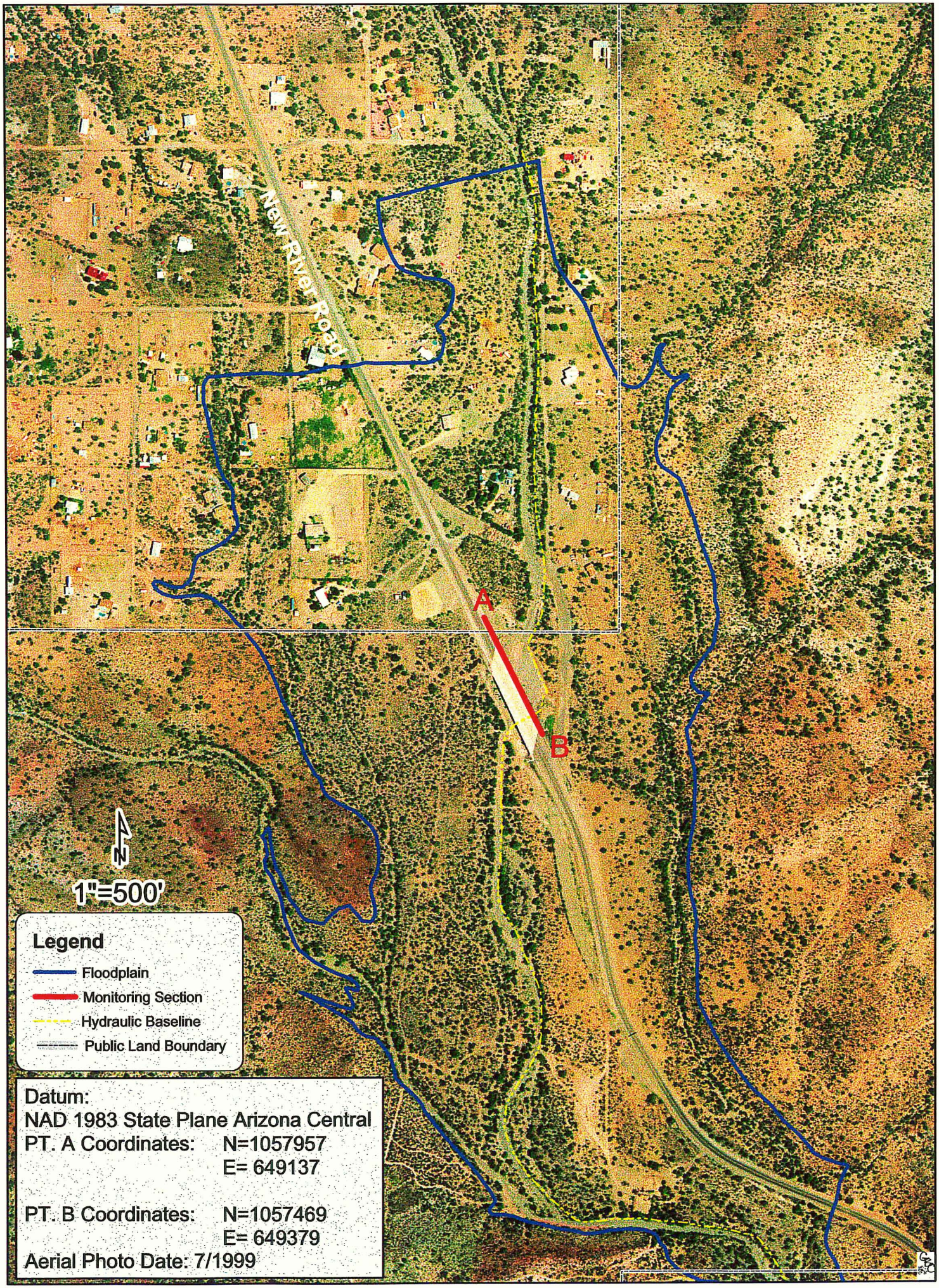
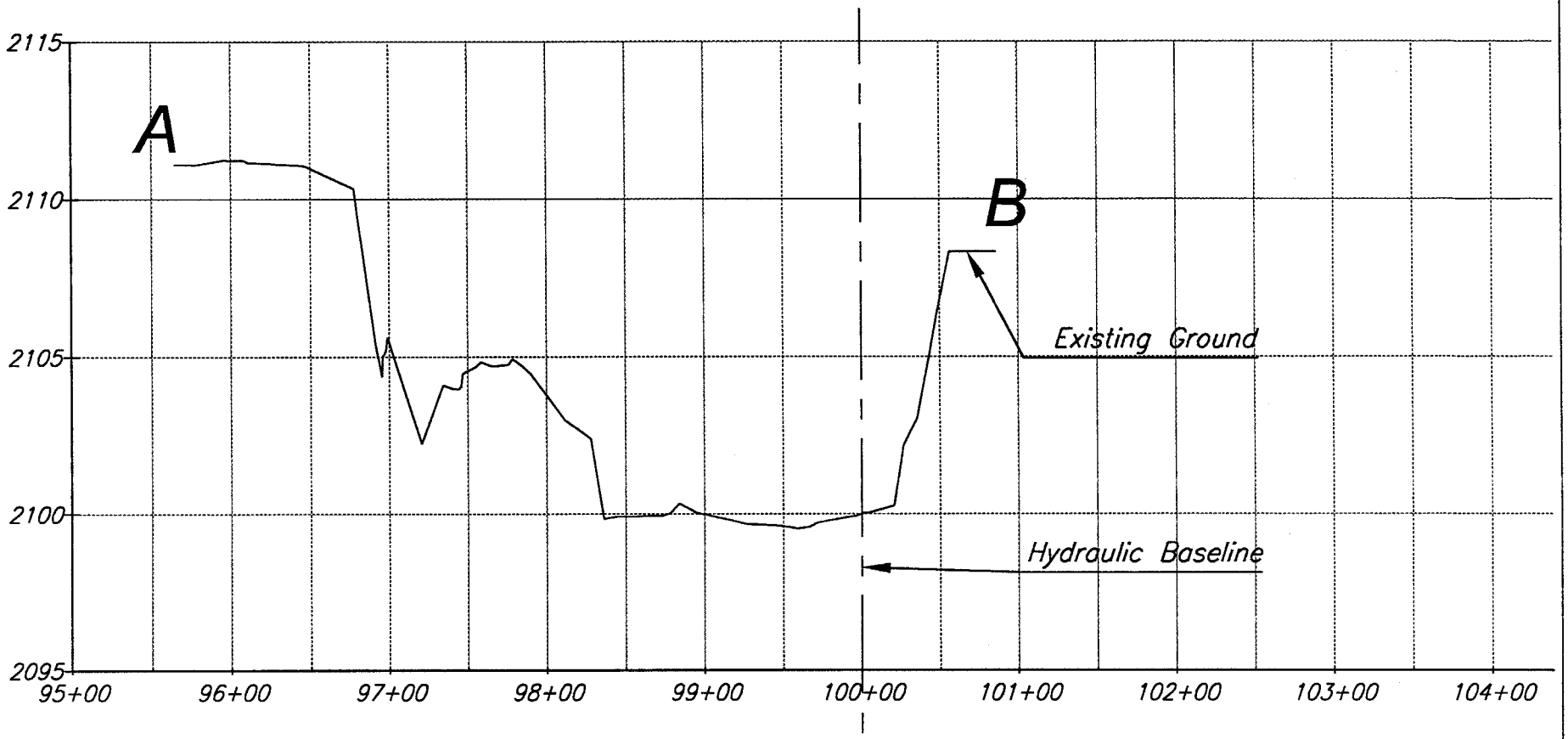


FIGURE 10-5.2.1a: MONITORING SITE 1



Scale: Vertical 1"=8'

NO.	REVISIONS	DATE	BY	CHK.

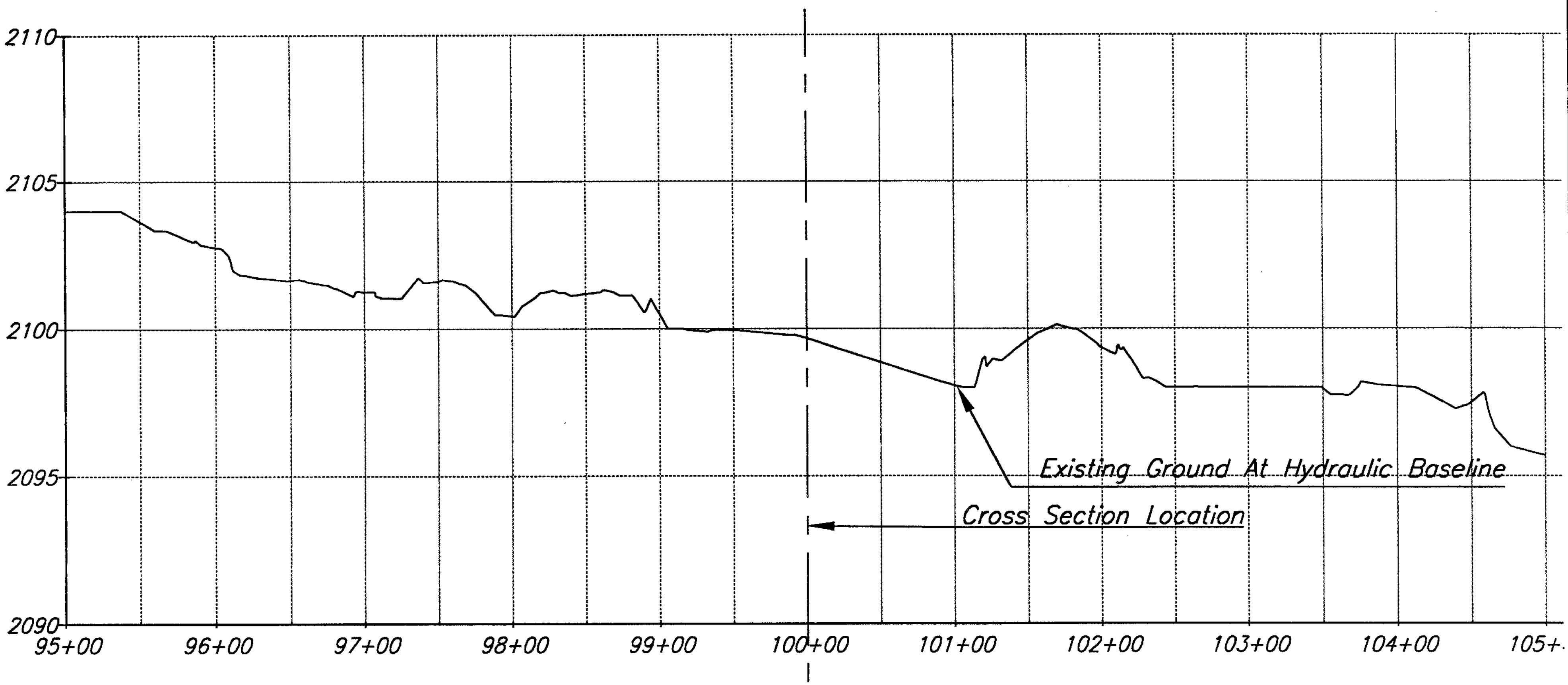
TETRA TECH, INC.
INFRASTRUCTURE SOUTHWEST GROUP

SKUNK CREEK
WATERCOURSE MASTER PLAN

JOB NO.	2360.0002
DESIGNED BY:	UAL
DRAWN BY:	CBC
CHECKED BY:	[illegible]
APPROVED BY:	[illegible]
DATE:	

FIGURE 10-5.2.1b
Monitoring Cross Section: 1
Baseline Data (December 1995)

SCALE:	HORIZ: 1" = 100'
CONT. INTERVAL =	
DRAWING NO.	MXS1
SHEET NO. 1	OF: 2



Scale: Vertical 1"=5'

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INFRASTRUCTURE SOUTHWEST GROUP

SKUNK CREEK
WATERCOURSE MASTER PLAN

FIGURE 10-5.2.1c
Monitoring Profile: 1
Baseline Data (December 1995)

SCALE: HORIZ: 1"= 100'
CONT. INTERVAL =
DRAWING NO. MPRO1
SHEET NO. 2 OF: 2

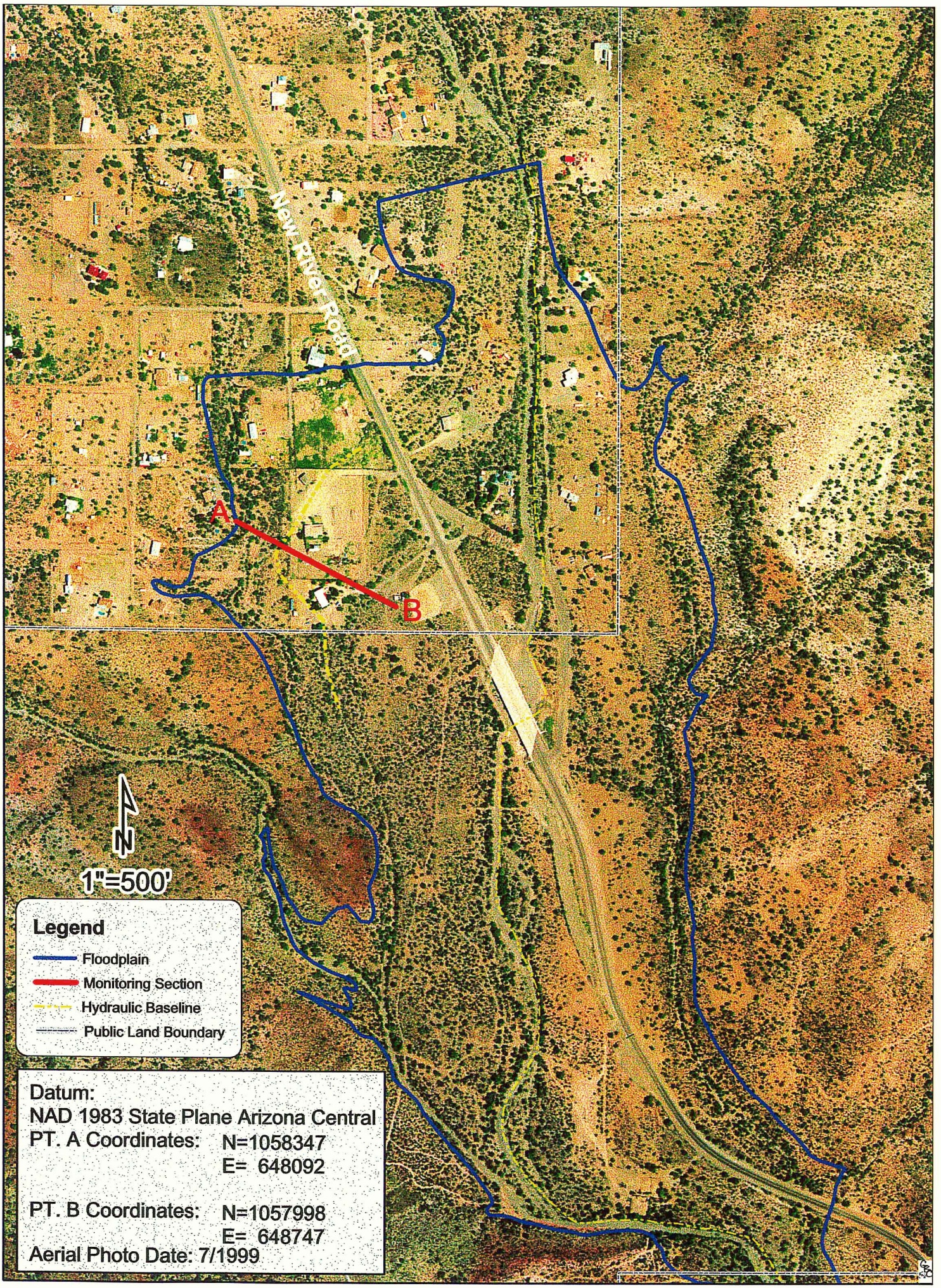
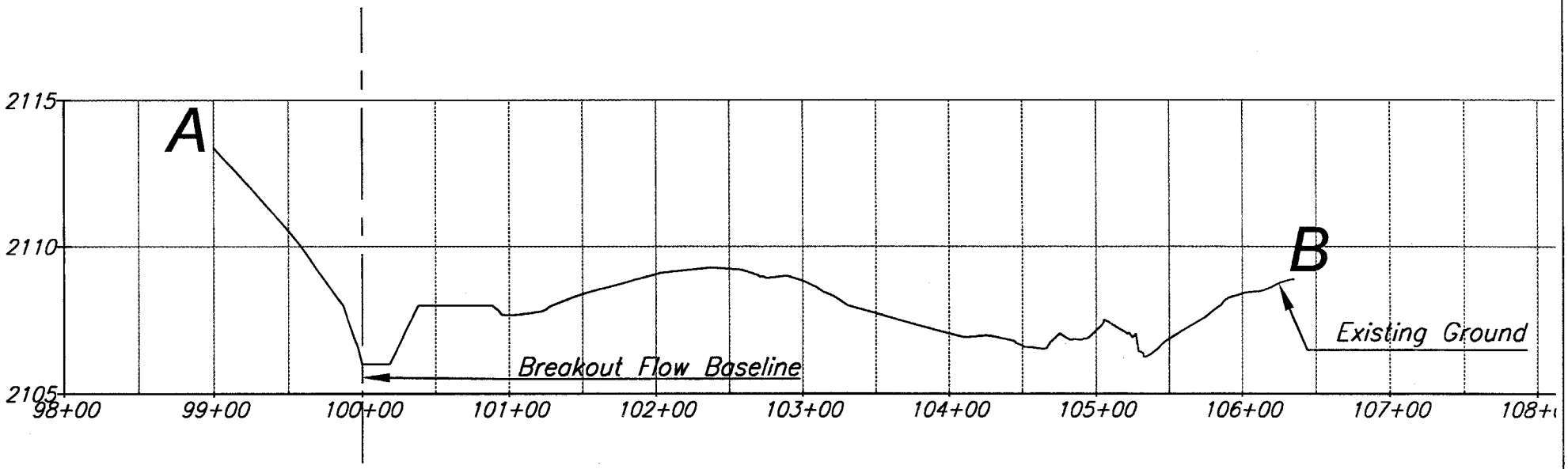


FIGURE 10-5.2.2a: MONITORING SITE 2



Scale: Vertical 1"=8'

NO.	REVISIONS	DATE	BY	CHK.

MISSLDWG

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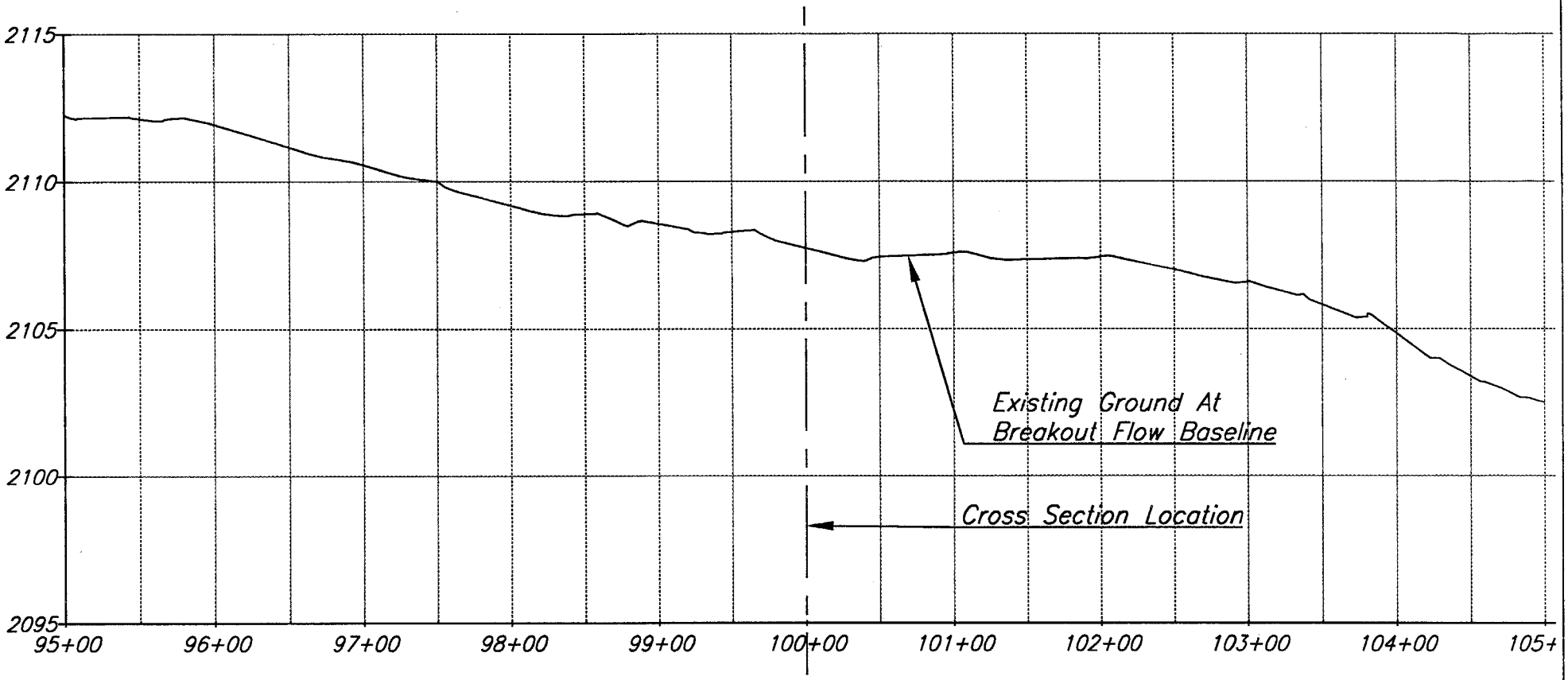
INFRASTRUCTURE SOUTHWEST GROUP

SKUNK CREEK
WATERCOURSE MASTER PLAN

JOB NO.	2300.0002
DESIGNED BY:	UIL
DRAWN BY:	CKC
CHECKED BY:	[illegible]
APPROVED BY:	[illegible]
DATE:	

FIGURE 10-5.2.2b
Monitoring Cross Section: 2
Baseline Data (December 1995)

SCALE: HORIZ: 1"= 100'
CONT. INTERVAL =
DRAWING NO. MXS2
SHEET NO. 1 OF: 2



Scale: Vertical 1"=5'

NO.	REVISIONS	DATE	BY	CHK.
MPRO2.DWG				

TETRA TECH, INC.
INFRASTRUCTURE SOUTHWEST GROUP
[illegible] Street, Suite 125, Phoenix, AZ [illegible]
[illegible] FAX [illegible]

SKUNK CREEK
WATERCOURSE MASTER PLAN

JOB NO.	2360.0002
DESIGNED BY:	UIL
DRAWN BY:	CBC
CHECKED BY:	[illegible]
APPROVED BY:	[illegible]
DATE:	

FIGURE 10-5.2.2c
Monitoring Profile: 2
Baseline Data (December 1995)

SCALE:	HORIZ: 1"= 100'
CONT. INTERVAL =	
DRAWING NO.	MPRO2
SHEET NO. 2	OF: 2

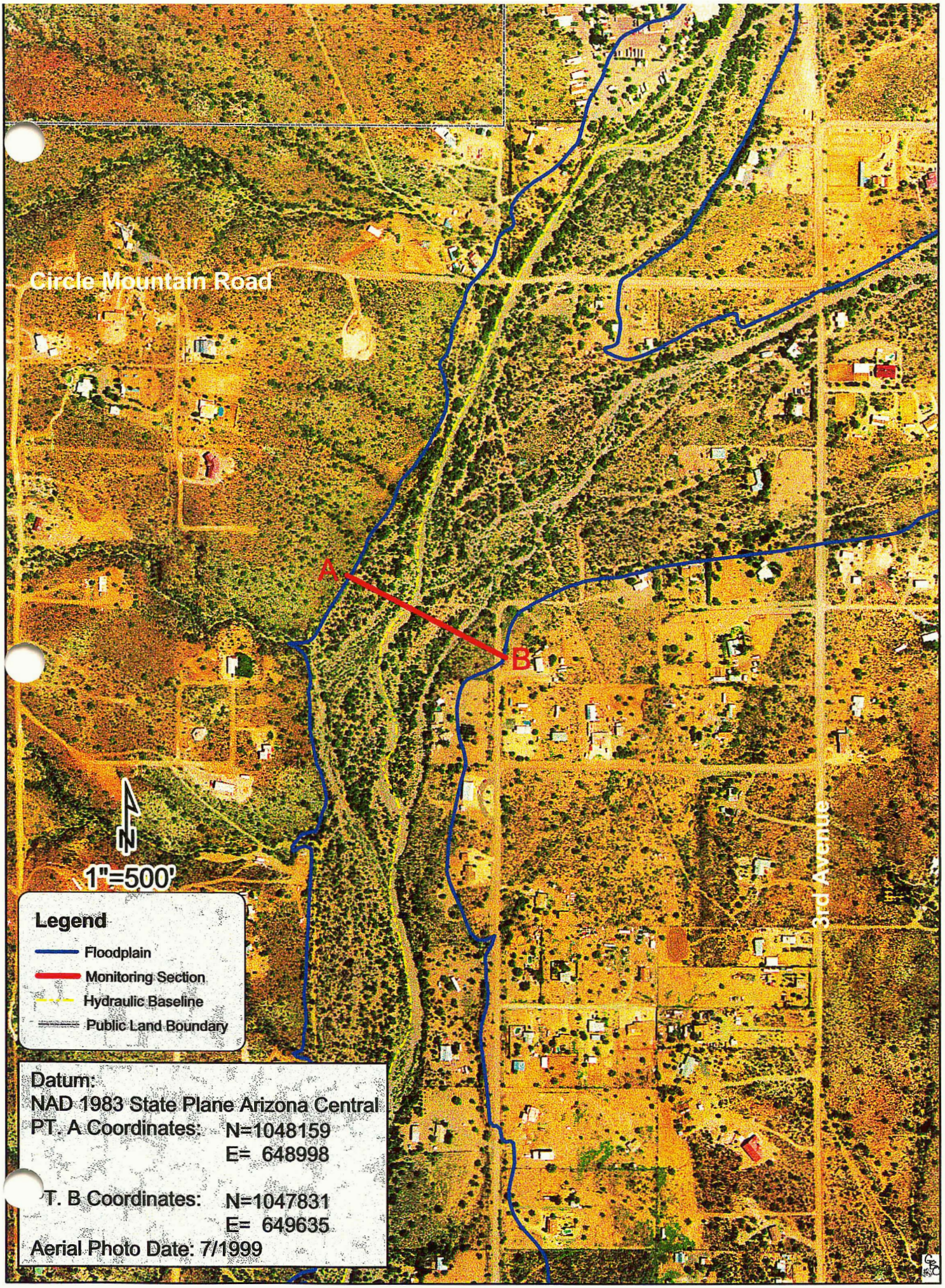
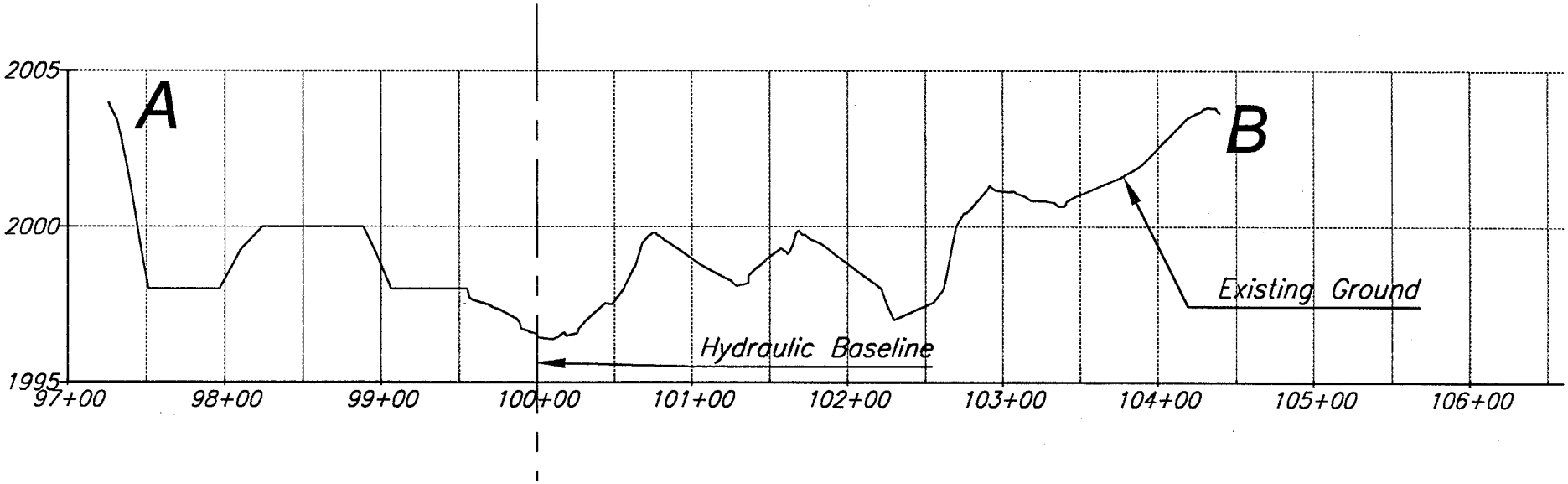


FIGURE 10-5.2.3a: MONITORING SITE 3



Scale: Vertical 1"=5'

NO.	REVISIONS	DATE	BY	CHK.

SIXSLONG

TETRA TECH, INC.
INFRASTRUCTURE SOUTHWEST GROUP

SKUNK CREEK
WATERCOURSE MASTER PLAN

JOB NO. 3360.0002
DESIGNED BY: LAL
DRAWN BY: CSC
CHECKED BY: SSB
APPROVED BY: SSB
DATE:

FIGURE 10-5.2.3b
Monitoring Cross Section: 3
Baseline Data (December 1995)

SCALE: HORIZ: 1"= 100'
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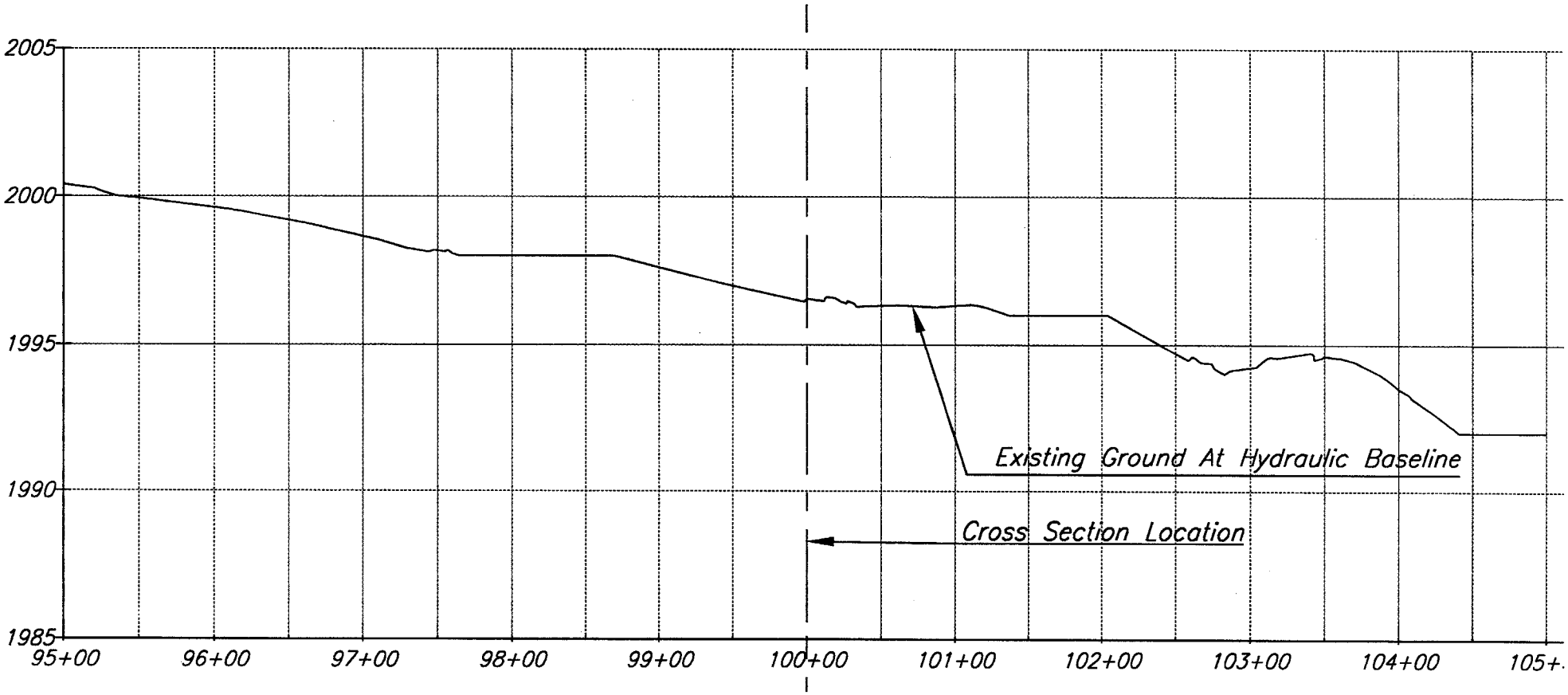
SHEET NO. 1 OF: 2



Scale: Vertical 1"=5'

NO.	REVISIONS	DATE	BY	CHK.

MPRO3.DWG

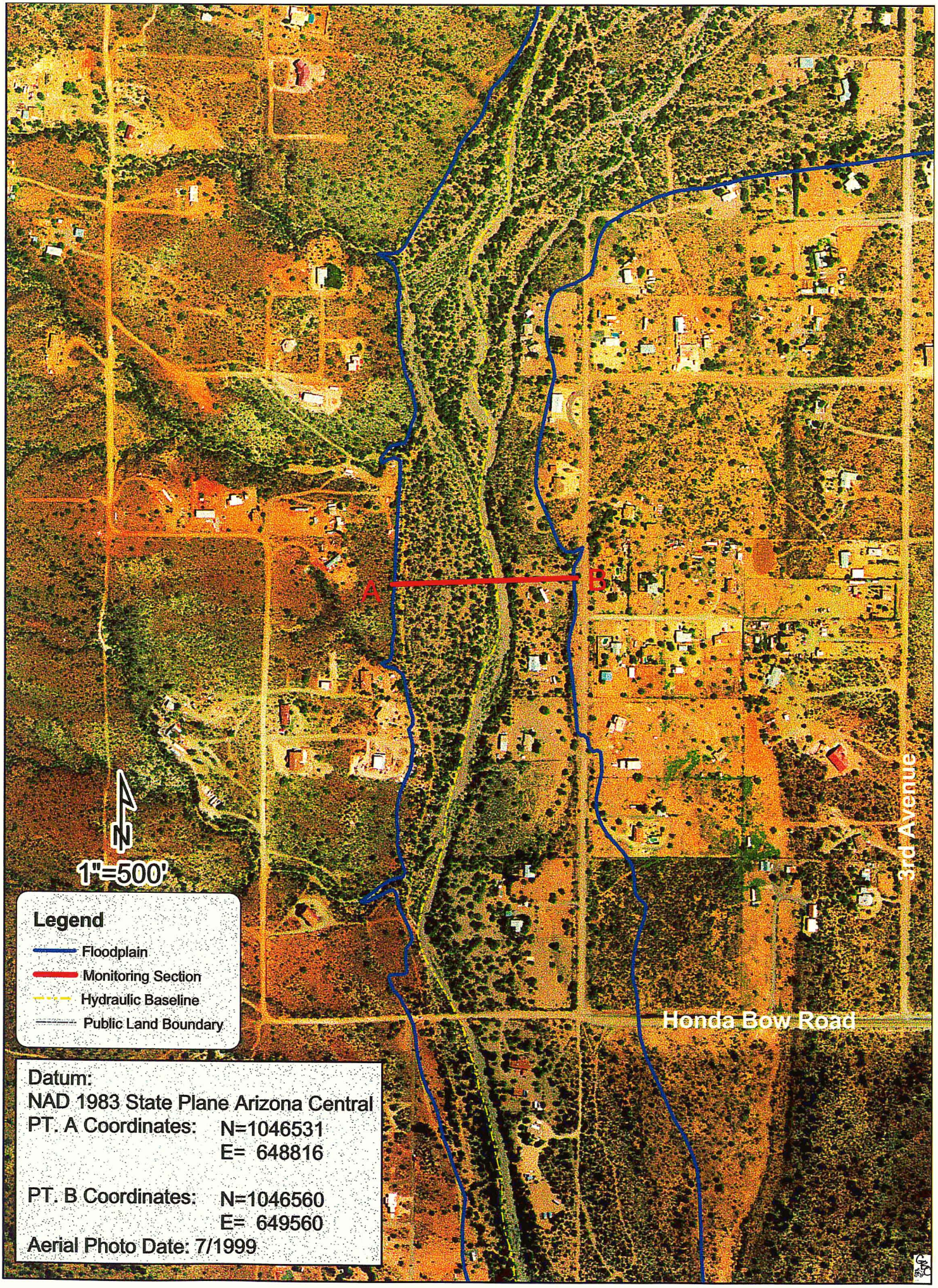
TETRA TECH, INC.
INFRASTRUCTURE SOUTHWEST GROUP

SKUNK CREEK
WATERCOURSE MASTER PLAN

JOB NO. 3300.0000
DESIGNED BY: UAL
DRAWN BY: CSC
CHECKED BY: [illegible]
APPROVED BY: [illegible]
DATE:

FIGURE 10-5.2.3c
Monitoring Profile: 3
Baseline Data (December 1995)

SCALE: HORIZ: 1"= 100'
CONT. INTERVAL =
DRAWING NO. MPRO3
SHEET NO. 2 OF 2



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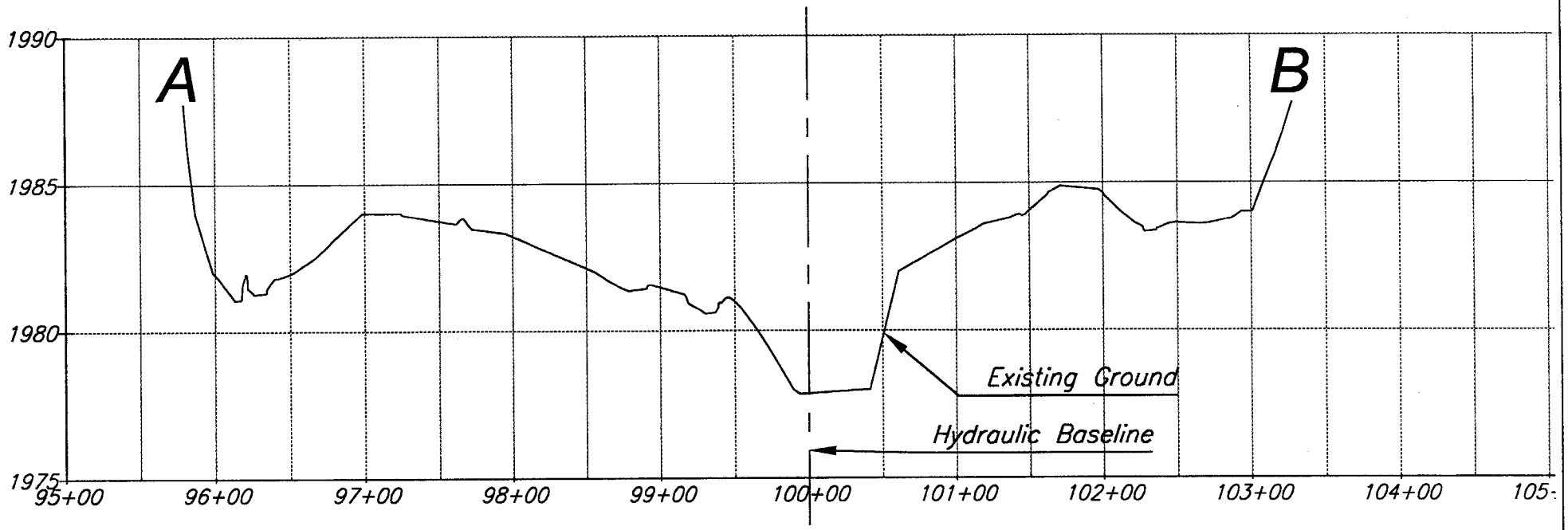


Scale: Vertical 1"=5'

NO.	REVISIONS	DATE	BY	CHK.
REMARKS				

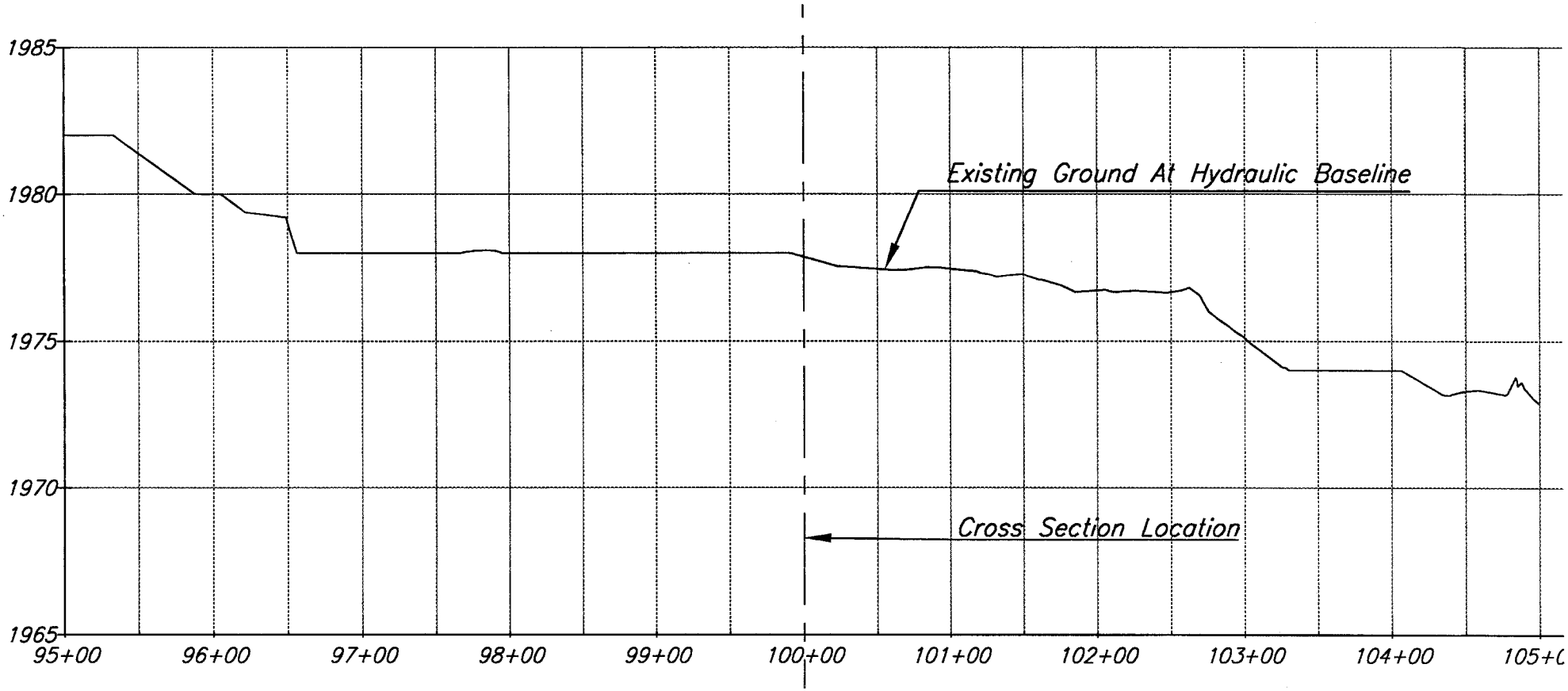
TETRA TECH, INC.
INFRASTRUCTURE SOUTHWEST GROUP

SKUNK CREEK
WATERCOURSE MASTER PLAN

JOB NO.	2360.0002
DESIGNED BY:	LML
DRAWN BY:	CSC
CHECKED BY:	[illegible]
APPROVED BY:	[illegible]
DATE:	

FIGURE 10-5.2.4b
Monitoring Cross Section: 4
Baseline Data (December 1995)

SCALE: HORIZ: 1"= 100'
CONT. INTERVAL =
DRAWING NO. MXS4
SHEET NO. 1 OF 2



Scale: Vertical 1"=5'

NO.	REVISIONS	DATE	BY	CHK.
MPROALDWG				

TETRA TECH, INC.
INFRASTRUCTURE SOUTHWEST GROUP

SKUNK CREEK
WATERCOURSE MASTER PLAN

JOB NO.	2360.0003
DESIGNED BY:	LAL
DRAWN BY:	CSC
CHECKED BY:	[illegible]
APPROVED BY:	[illegible]
DATE:	

FIGURE 10-5.2.4c
Monitoring Profile: 4
Baseline Data (December 1995)

SCALE: HORIZ: 1"= 100'
CONT. INTERVAL =
DRAWING NO. MPRO4
SHEET NO. 2 OF 2

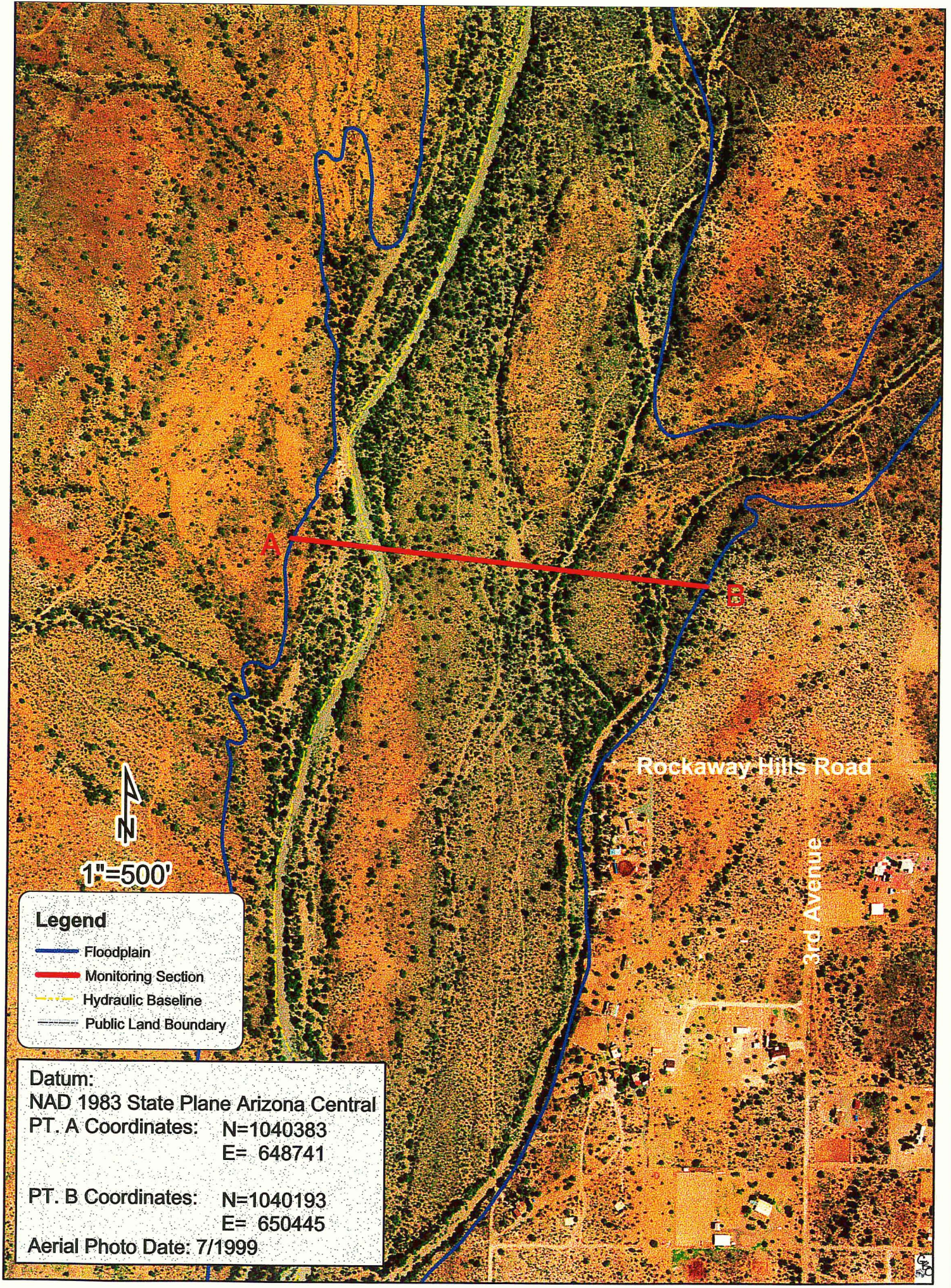
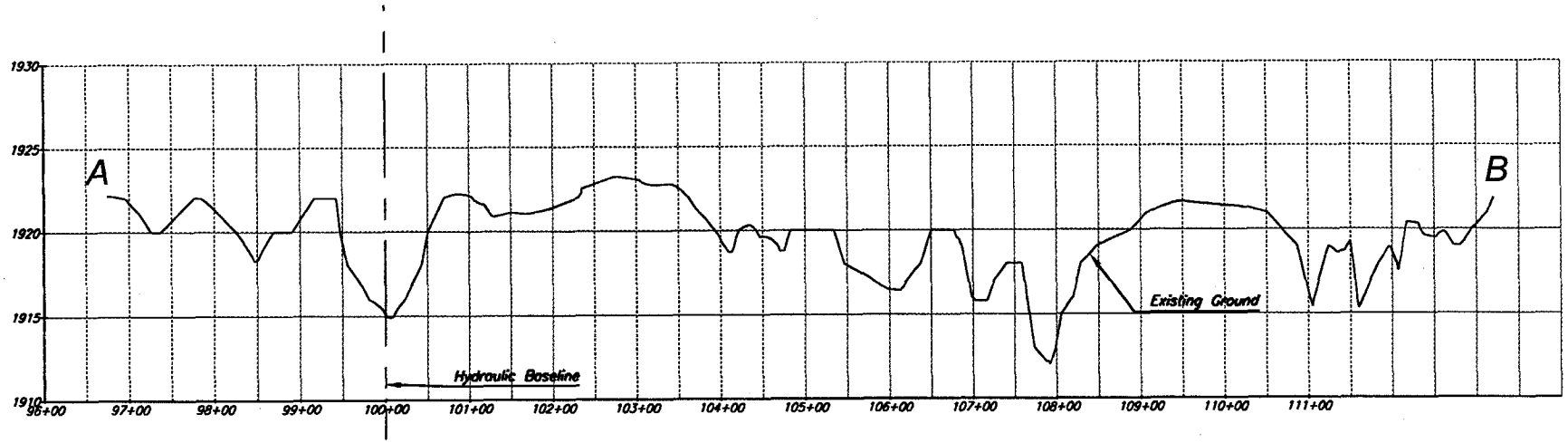


FIGURE 10-5.2.5a: MONITORING SITE 5



Scale: Vertical 1"=10'

NO.	REVISIONS	DATE	BY	CHK.

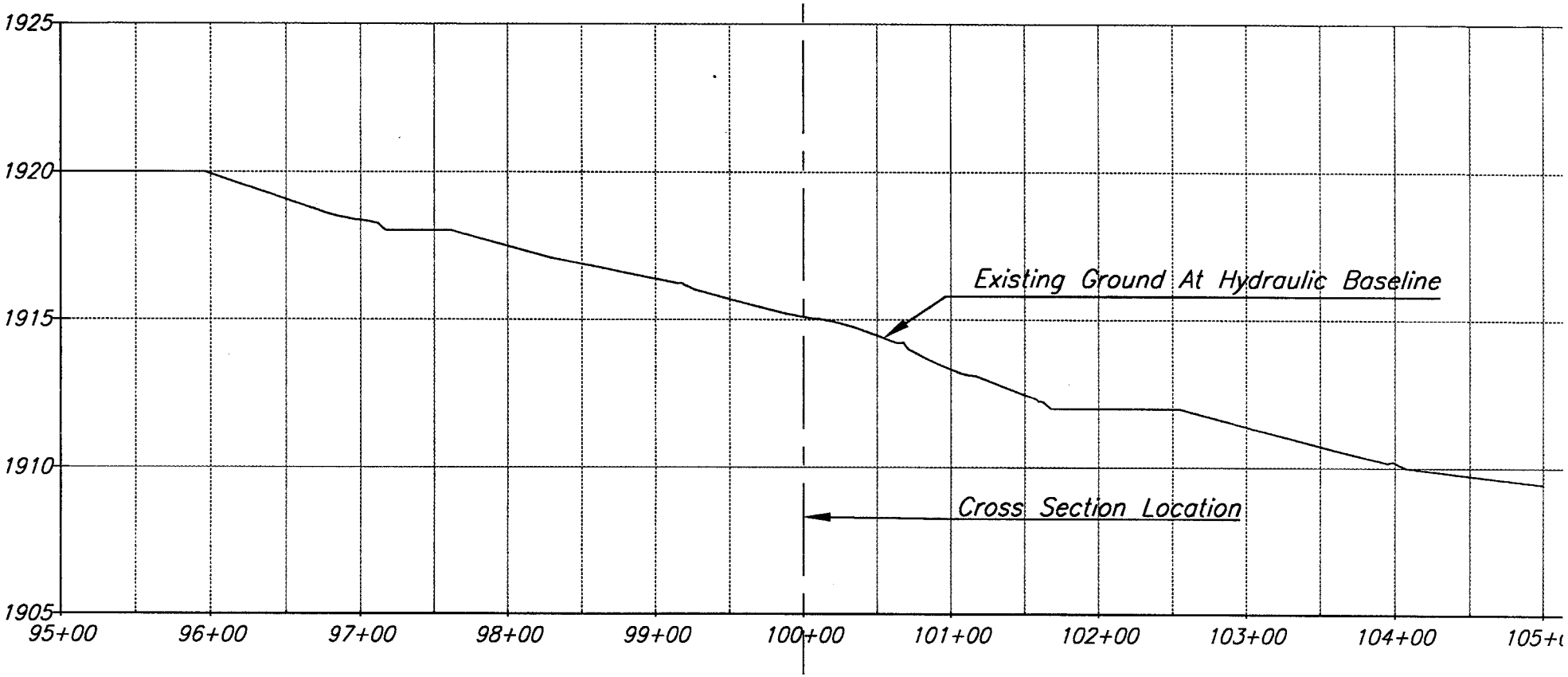
TETRA TECH, INC.
INFRASTRUCTURE SOUTHWEST GROUP

SKUNK CREEK
WATERCOURSE MASTER PLAN

JOB NO.
DESIGNED BY: LRL
DRAWN BY: CSC
CHECKED BY:
APPROVED BY:
DATE:

FIGURE 10-5.2.5b
Monitoring Cross Section: 5
Baseline Data (December 1995)

SCALE: HORIZ: 1"= 200'
CONT. INTERVAL =
DRAWING NO. MXS5
SHEET NO. 1 OF 2



Scale: Vertical 1"=5'

NO.	REVISIONS	DATE	BY	CHK.

TETRA TECH, INC.
INFRASTRUCTURE SOUTHWEST GROUP

SKUNK CREEK
WATERCOURSE MASTER PLAN

JOB NO. 3390.0002
DESIGNED BY: LHL
DRAWN BY: CBC
CHECKED BY:
APPROVED BY:
DATE:

FIGURE 10-5.2.5c
Monitoring Profile: 5
Baseline Data (December 1995)

SCALE: HORIZ: 1"= 100'
CONT. INTERVAL =
DRAWING NO. MPR05
SHEET NO. 2 OF 2

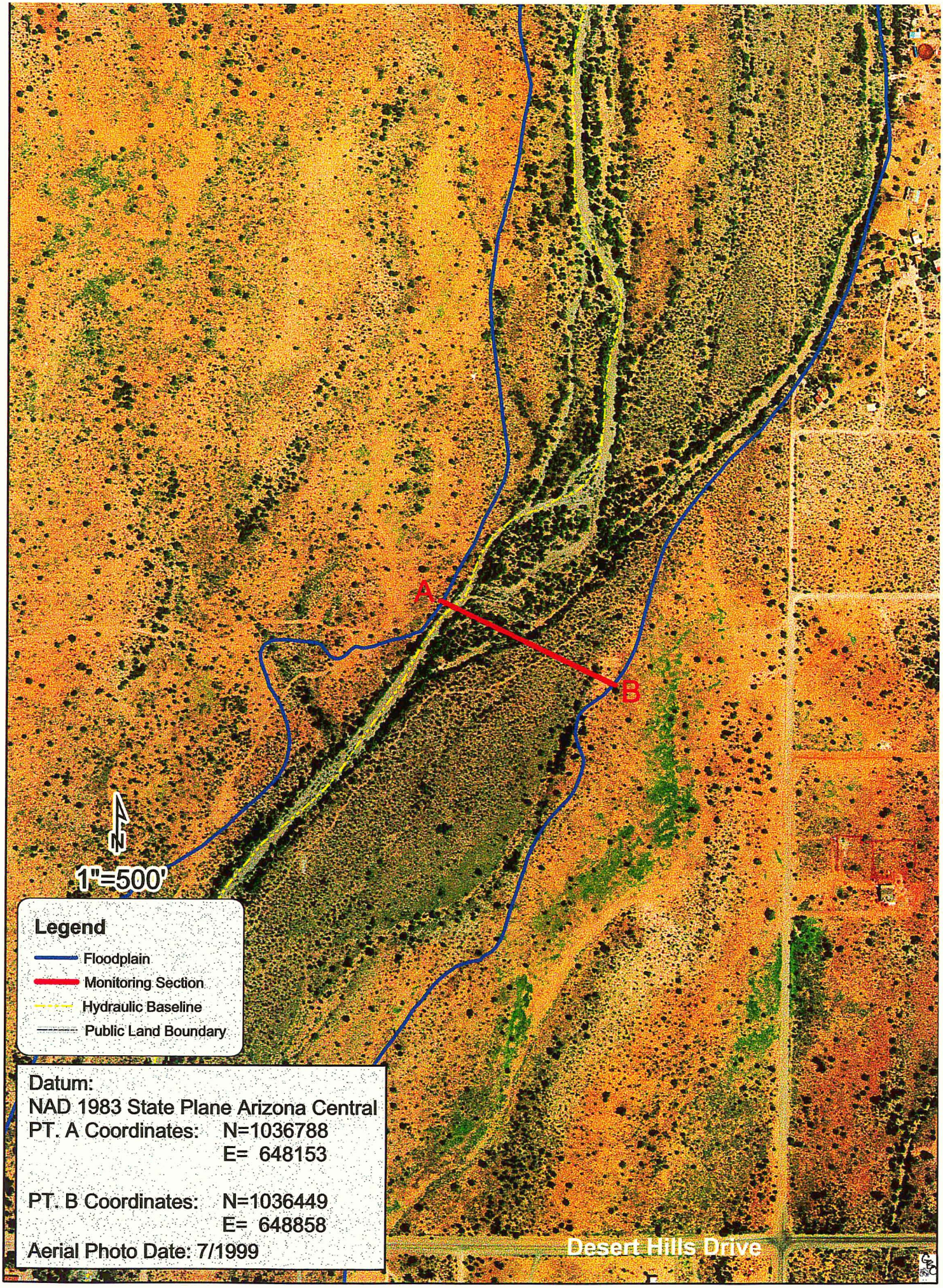
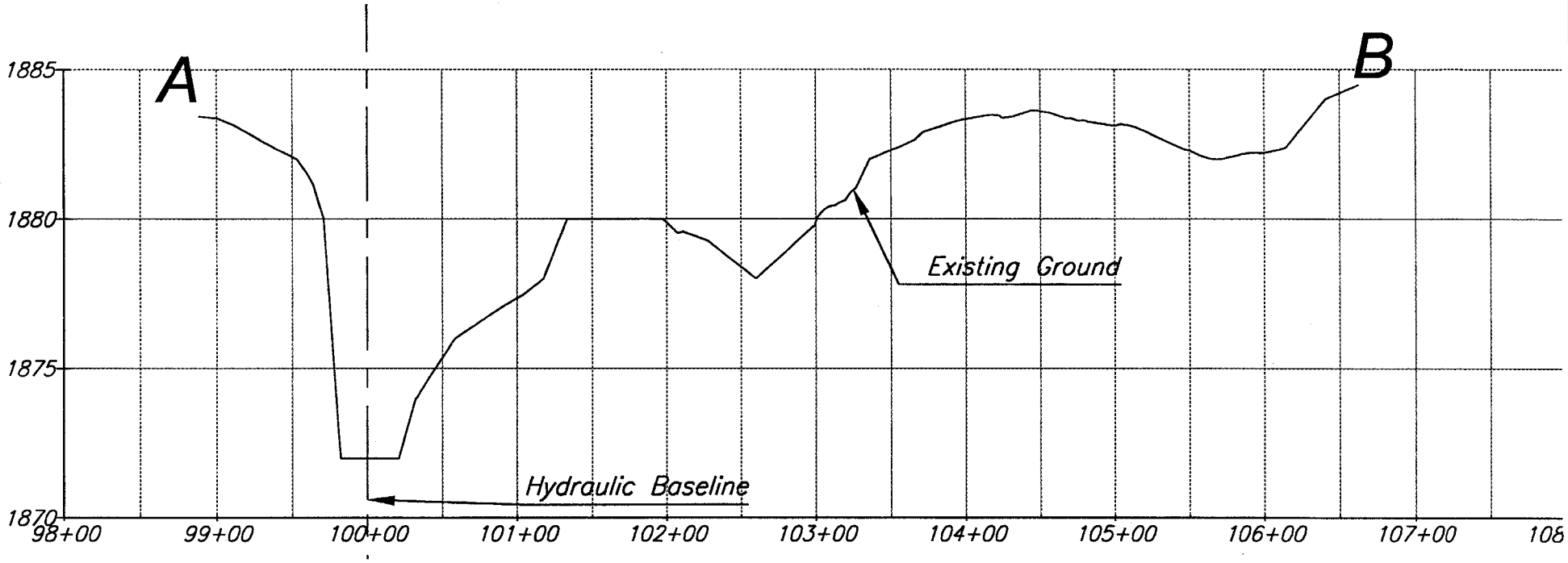


FIGURE 10-5.2.6a: MONITORING SITE 6



Scale: Vertical 1"=5'

NO.	REVISIONS	DATE	BY	CHK.

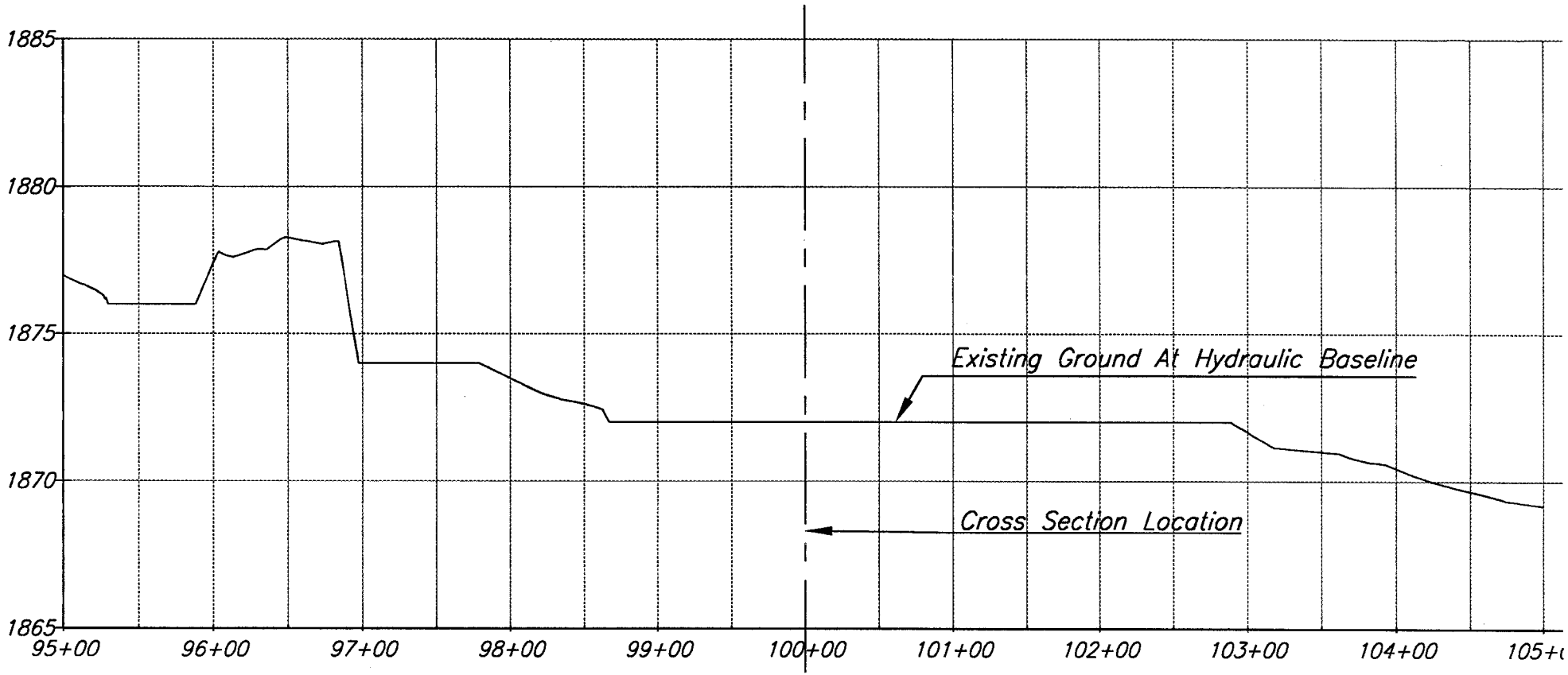
TETRA TECH, INC.
INFRASTRUCTURE SOUTHWEST GROUP

SKUNK CREEK
WATERCOURSE MASTER PLAN

JOB NO. 2360.0002
DESIGNED BY: LKL
DRAWN BY: CDC
CHECKED BY: BBB
APPROVED BY: BBB
DATE:

FIGURE 10-5.2.6b
Monitoring Cross Section: 6
Baseline Data (December 1995)

SCALE: HORIZ: 1"= 100'
CONT. INTERVAL =
DRAWING NO. MXS6
SHEET NO. 1 OF 2



Scale: Vertical 1"=5'

NO.	REVISIONS	DATE	BY	CHK.
MPROLDWG				

TETRA TECH, INC.
INFRASTRUCTURE SOUTHWEST GROUP

SKUNK CREEK
WATERCOURSE MASTER PLAN

JOB NO.	3390.0000
DESIGNED BY:	UNL
DRAWN BY:	CBC
CHECKED BY:	[illegible]
APPROVED BY:	[illegible]
DATE:	

FIGURE 10-5.2.6c
Monitoring Profile: 6
Baseline Data (December 1995)

SCALE:	HORIZ: 1"= 100'
CONT. INTERVAL =	
DRAWING NO.	MPRO6
SHEET NO. 2	OF: 2

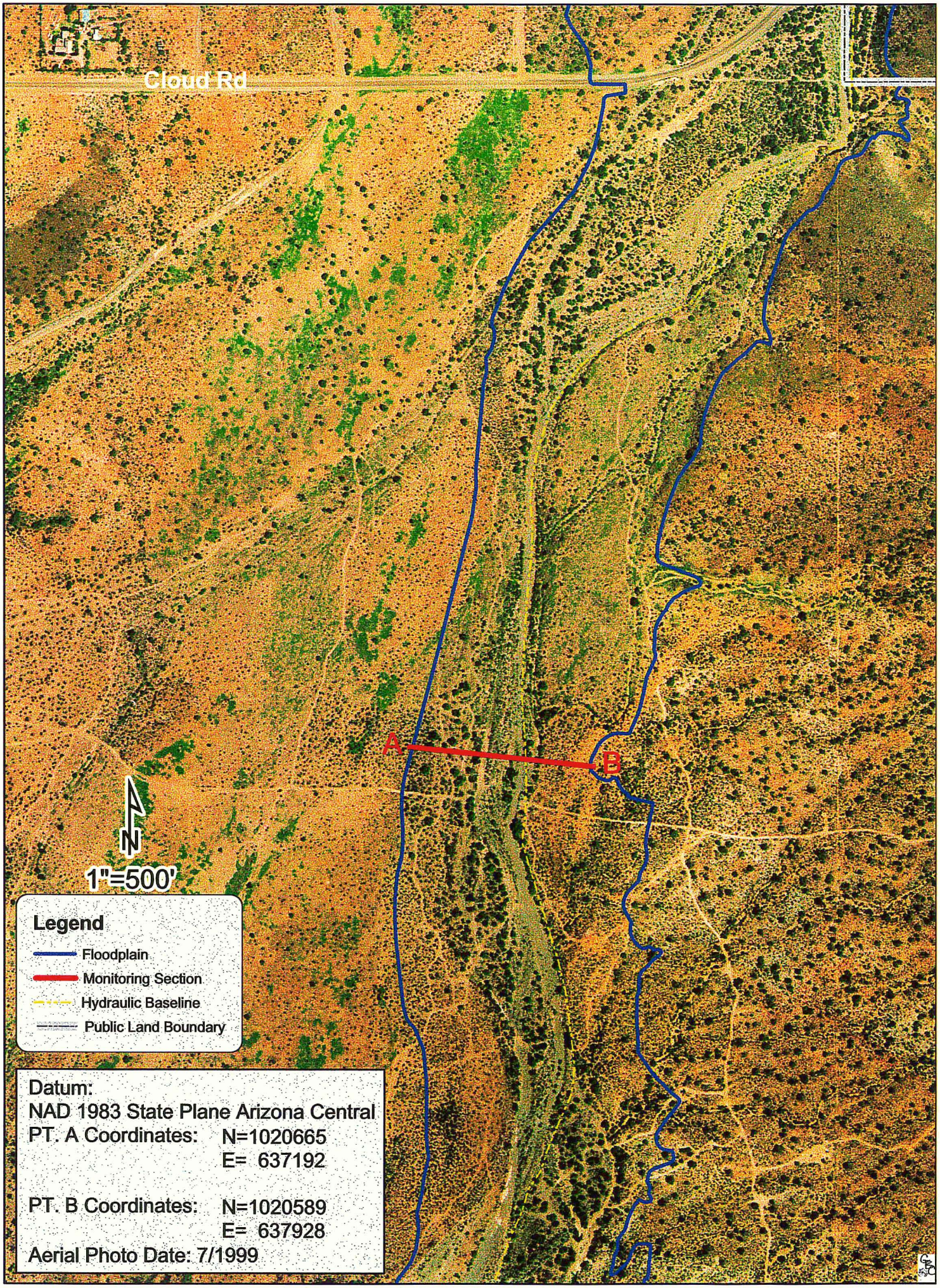
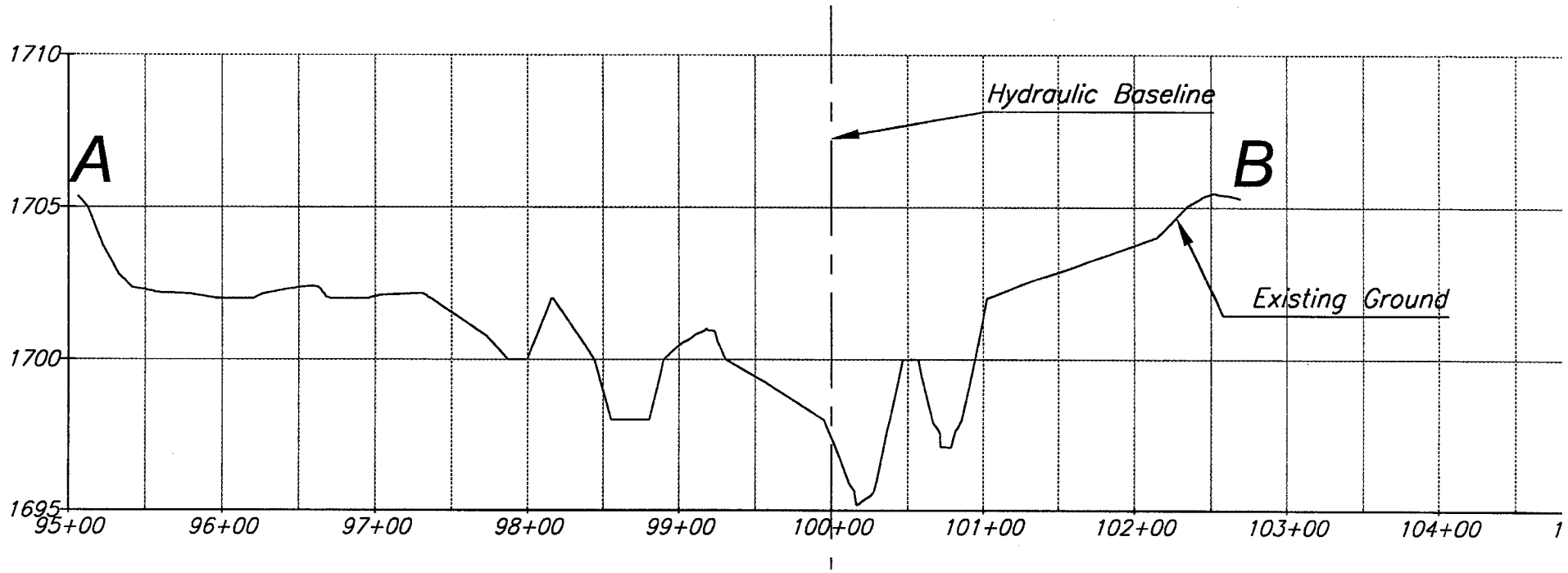


FIGURE 10-5.2.7a: MONITORING SITE 7



Scale: Vertical 1"=5'

NO.	REVISIONS	DATE	BY	CHK.

MXS7.DWG

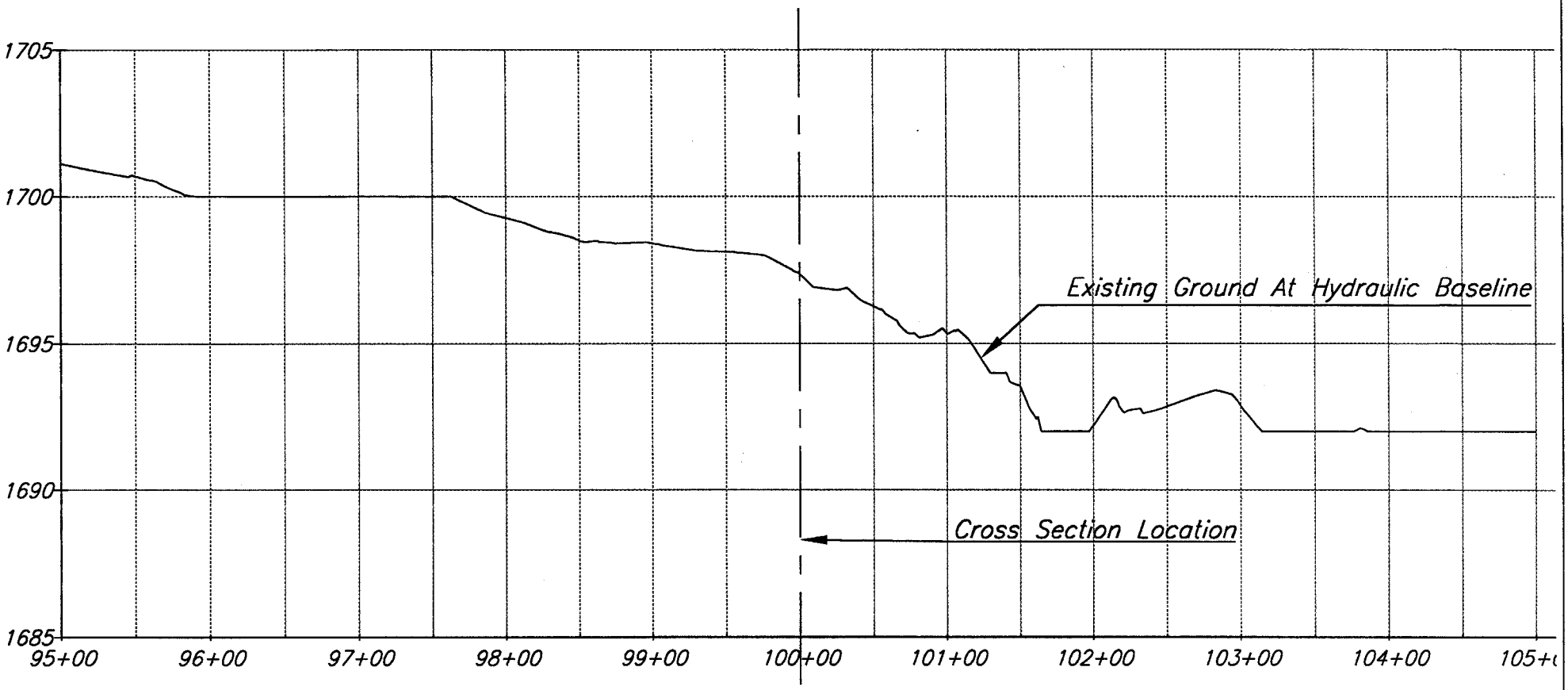
TETRA TECH, INC.
INFRASTRUCTURE SOUTHWEST GROUP

SKUNK CREEK
WATERCOURSE MASTER PLAN

JOB NO.	3390.0002
DESIGNED BY:	UAL
DRAWN BY:	CSC
CHECKED BY:	SSS
APPROVED BY:	SSS
DATE:	

FIGURE 10-5.2.7b
Monitoring Cross Section: 7
Baseline Data (December 1995)

SCALE: HORIZ: 1"= 100'
CONT. INTERVAL =
DRAWING NO. MXS7
SHEET NO. 1 OF 2



Scale: Vertical 1"=8'

NO.	REVISIONS	DATE	BY	CHK.

MPRO7.DWG

TETRA TECH, INC.
INFRASTRUCTURE SOUTHWEST GROUP

SKUNK CREEK
WATERCOURSE MASTER PLAN

JOB NO.	2360.0003
DESIGNED BY:	LAL
DRAWN BY:	CRC
CHECKED BY:	[illegible]
APPROVED BY:	[illegible]
DATE:	

FIGURE 10-5.2.7c
Monitoring Profile: 7
Baseline Data (December 1995)

SCALE: HORIZ: 1" = 100'
CONT. INTERVAL =
DRAWING NO. MPRO7
SHEET NO. 2 OF 2

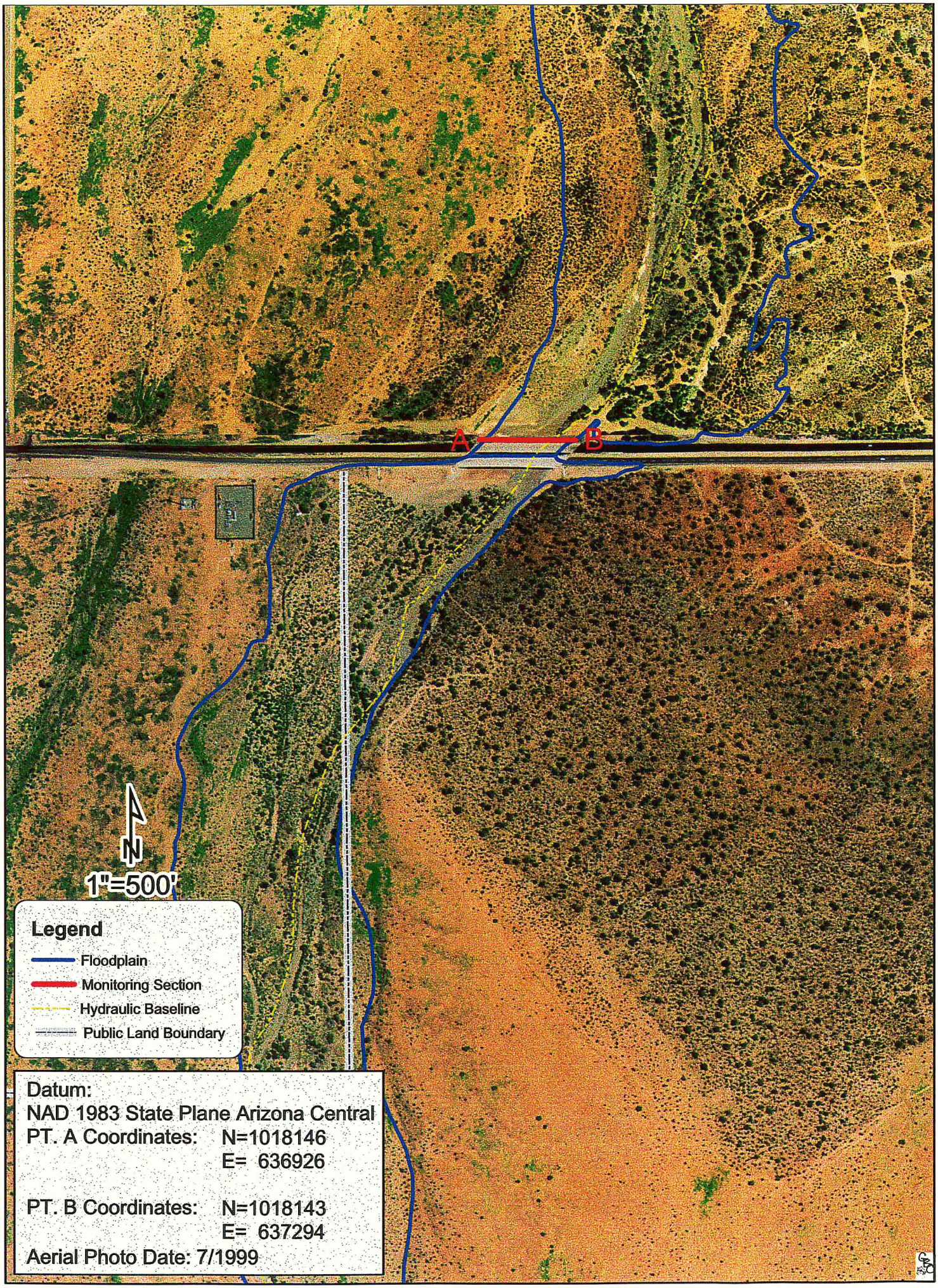
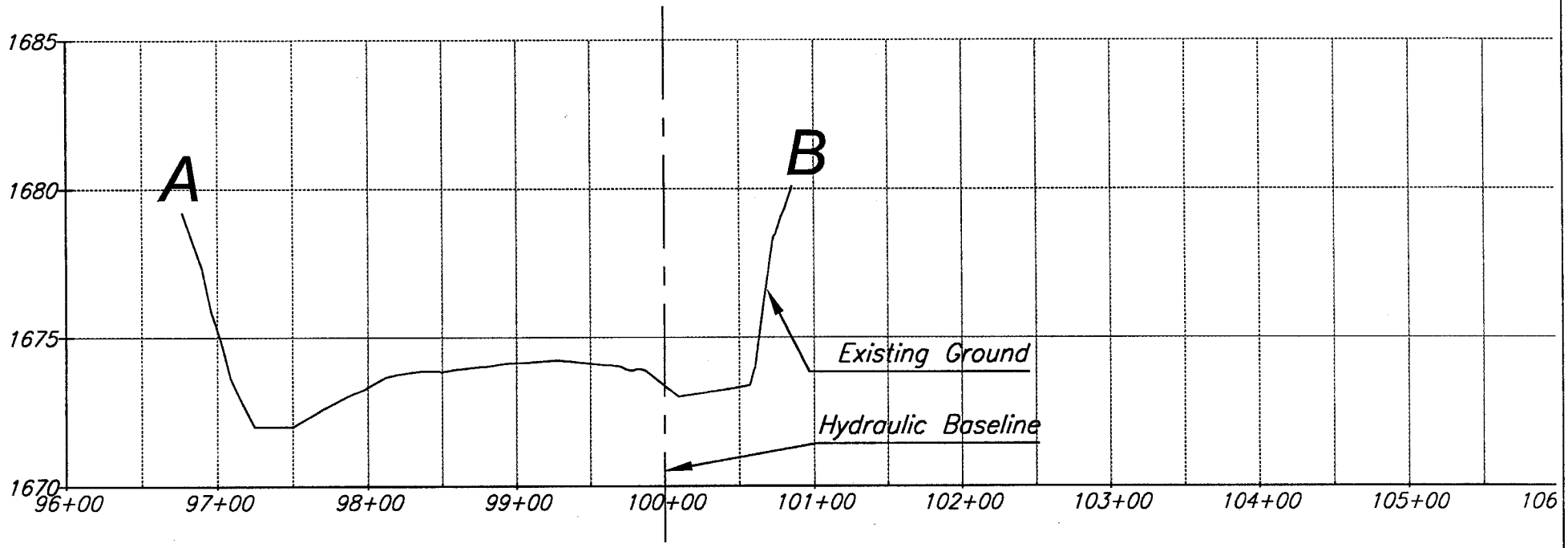


FIGURE 10-5.2.8a: MONITORING SITE 8



Scale: Vertical 1"=5'

NO.	REVISIONS	DATE	BY	CHK.

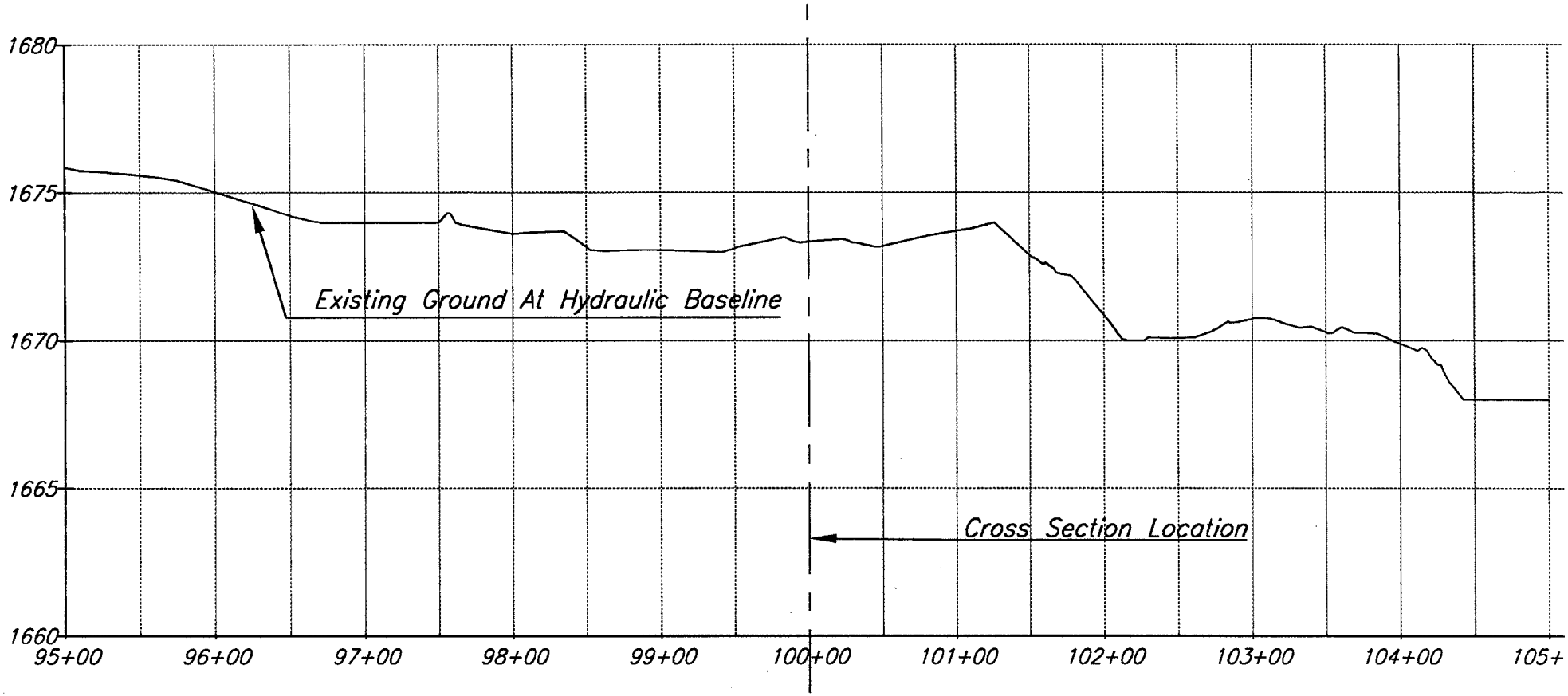
TETRA TECH, INC.
INFRASTRUCTURE SOUTHWEST GROUP

SKUNK CREEK
WATERCOURSE MASTER PLAN

JOB NO.	2360.0002
DESIGNED BY:	LHL
DRAWN BY:	CRC
CHECKED BY:	[illegible]
APPROVED BY:	[illegible]
DATE:	

FIGURE 10-5.2.8b
Monitoring Cross Section: 8
Baseline Data (December 1995)

SCALE: HORIZ: 1"= 100'
CONT. INTERVAL =
DRAWING NO. MXS8
SHEET NO. 1 OF 2



Scale: Vertical 1"=5'

NO.	REVISIONS	DATE	BY	CHK.

MPROS.DWG

TETRA TECH, INC.
INFRASTRUCTURE SOUTHWEST GROUP

SKUNK CREEK
WATERCOURSE MASTER PLAN

JOB NO. 2380.0002
DESIGNED BY: LIL
DRAWN BY: CRC
CHECKED BY: SSB
APPROVED BY: SSB
DATE:

FIGURE 10-5.2.8c
Monitoring Profile: 8
Baseline Data (December 1995)

SCALE: HORIZ: 1"= 100'
CONT. INTERVAL =
DRAWING NO. MPRO8
SHEET NO. 2 OF 2

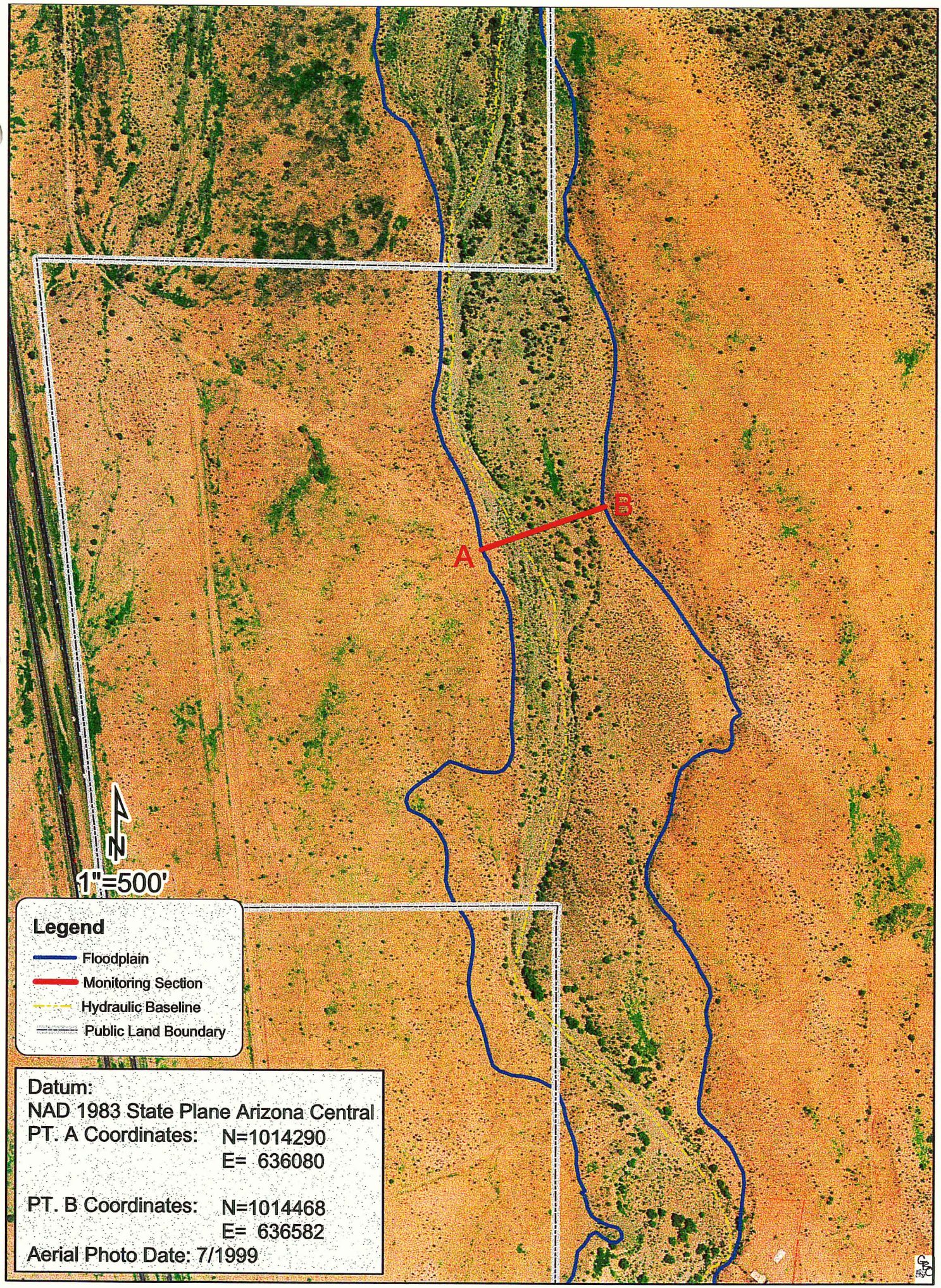
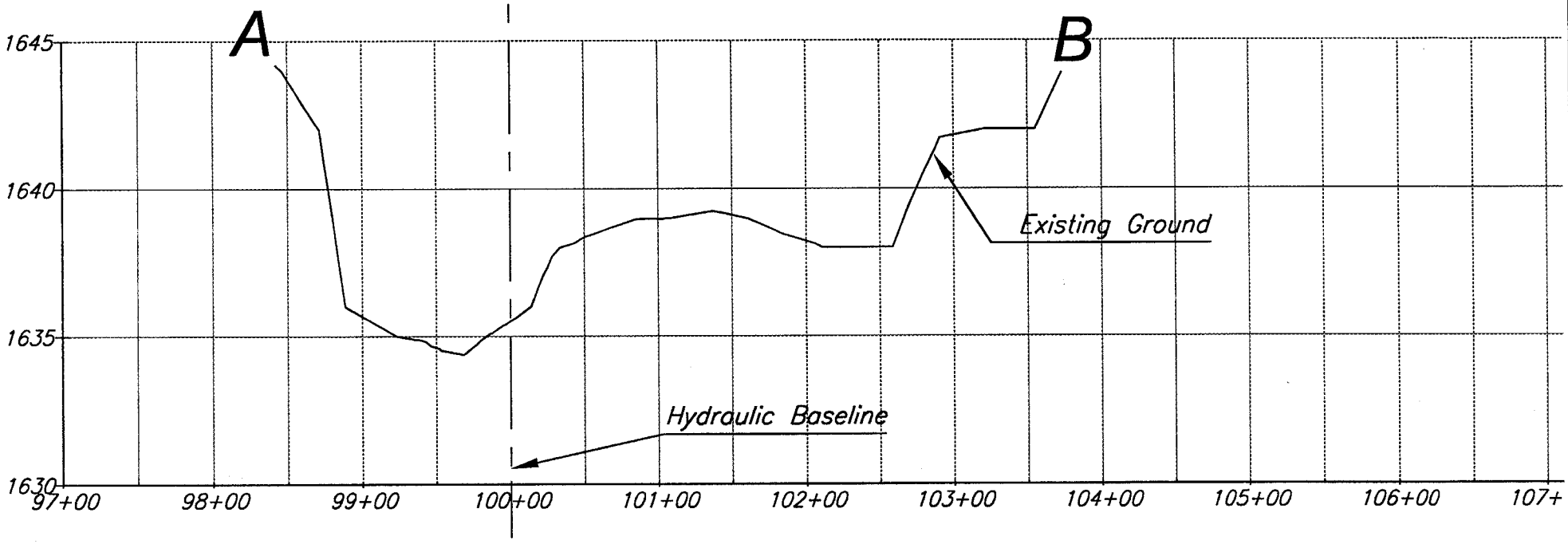


FIGURE 10-5.2.9a: MONITORING SITE 9



Scale: Vertical 1"=5'

NO.	REVISIONS	DATE	BY	CHK.

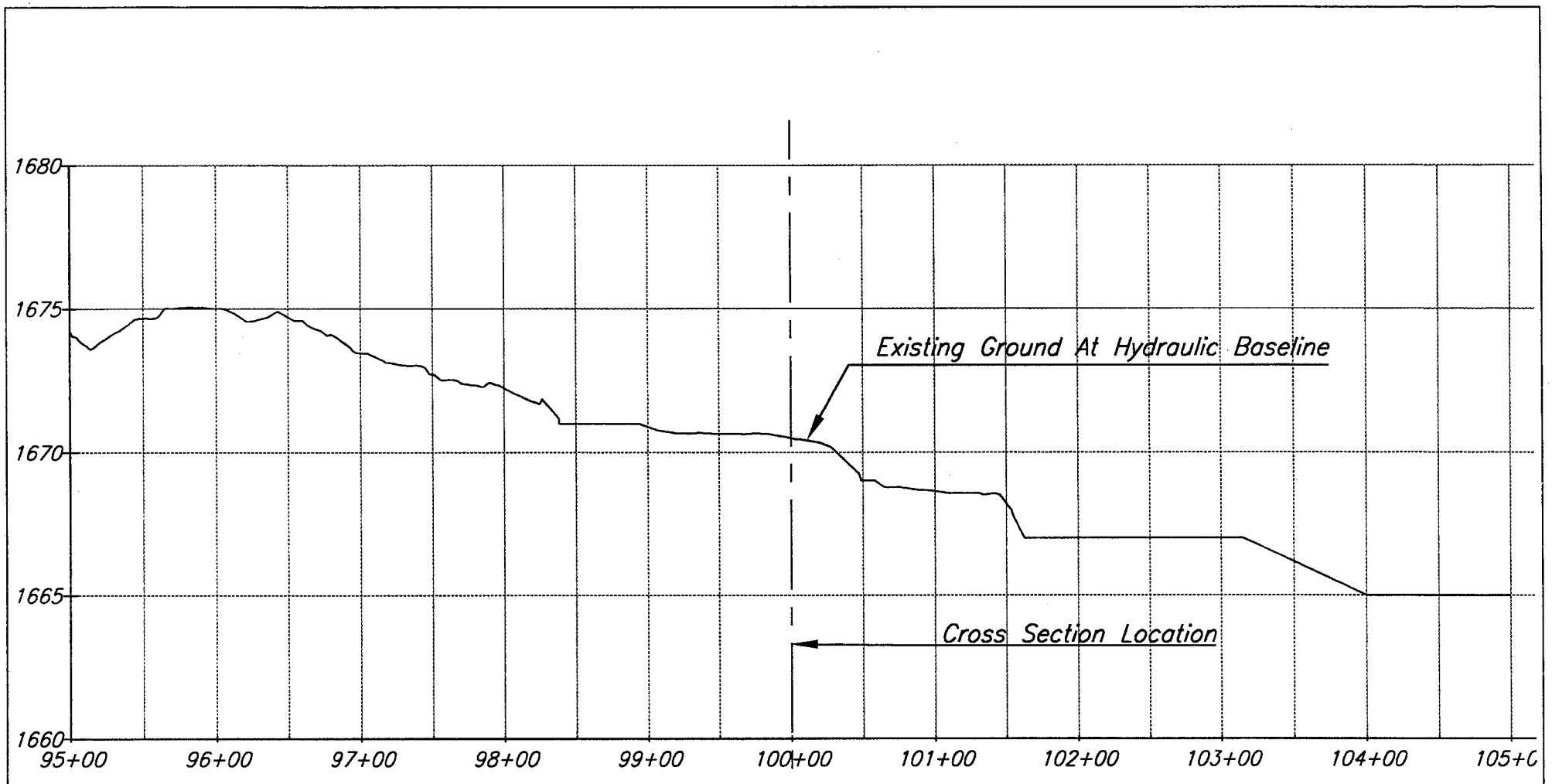
TETRA TECH, INC.
INFRASTRUCTURE SOUTHWEST GROUP

SKUNK CREEK
WATERCOURSE MASTER PLAN

JOB NO. 2360.0002
DESIGNED BY: LML
DRAWN BY: CSC
CHECKED BY: BBB
APPROVED BY: BBB
DATE:

FIGURE 10-5.2.9b
Monitoring Cross Section: 9
Baseline Data (December 1995)

SCALE: HORIZ: 1" = 100'
CONT. INTERVAL =
DRAWING NO. MXS9
SHEET NO. 1 OF 2



Scale: Vertical 1"=5'

NO.	REVISIONS	DATE	BY	CHK.

TETRA TECH, INC.
INFRASTRUCTURE SOUTHWEST GROUP

SKUNK CREEK
WATERCOURSE MASTER PLAN

JOB NO. 2360.0002
DESIGNED BY: LML
DRAWN BY: CRC
CHECKED BY: BBB
APPROVED BY: BBB
DATE:

FIGURE 10-5.2.9c
Monitoring Profile: 9
Baseline Data (December 1995)

SCALE: HORIZ: 1" = 100'
CONT. INTERVAL =
DRAWING NO. MPRO9
SHEET NO. 2 OF 2

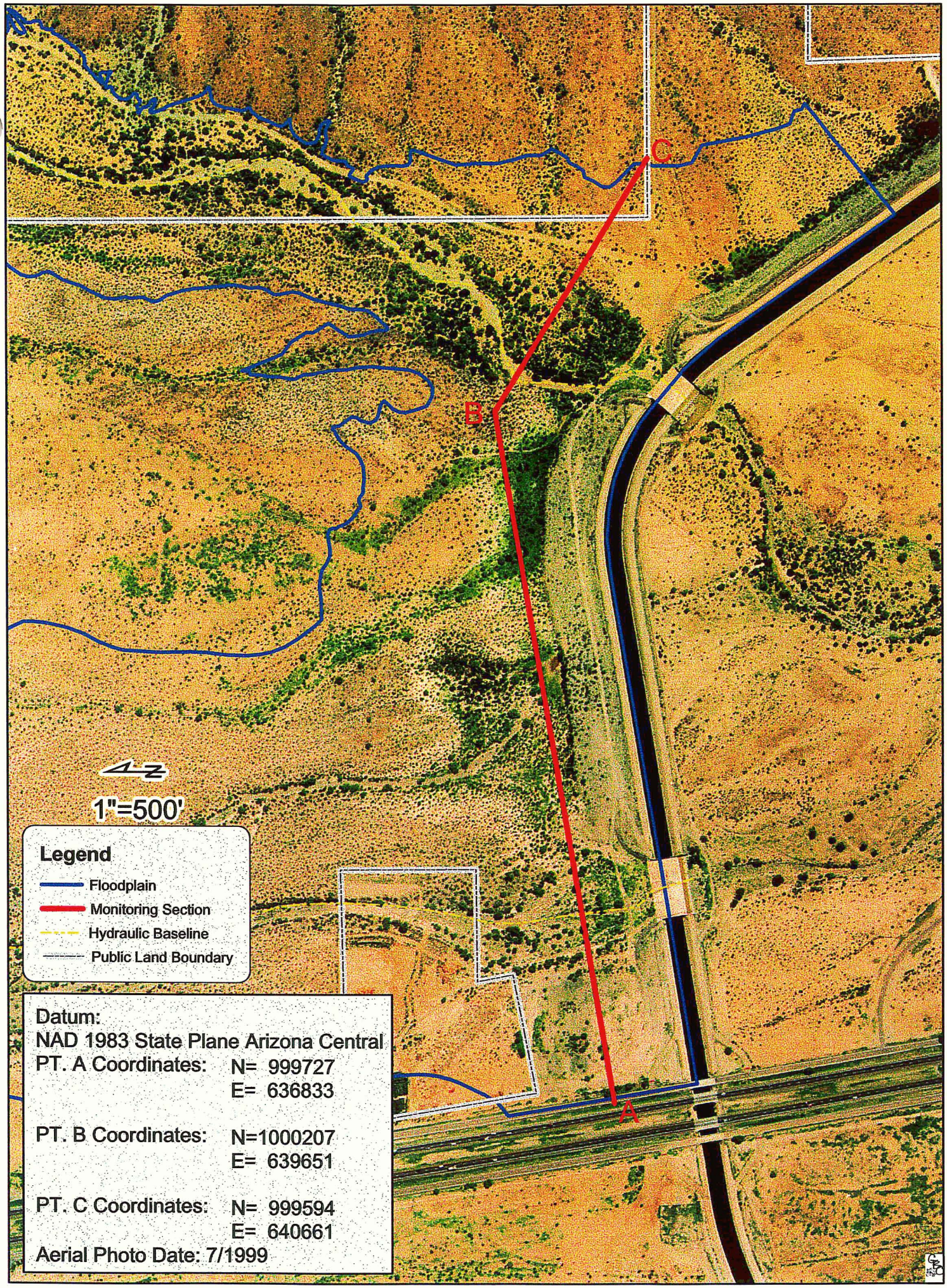
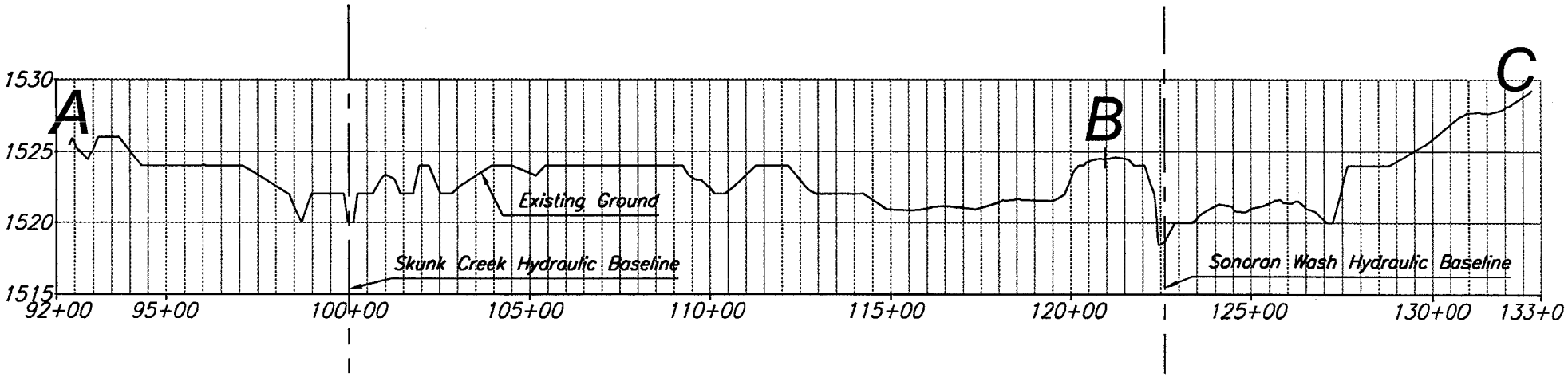


FIGURE 10–5.2.10a: MONITORING SITE 10



Scale: Vertical 1"=10'

NO.	REVISIONS	DATE	BY	CHK.

BOISTOLOING

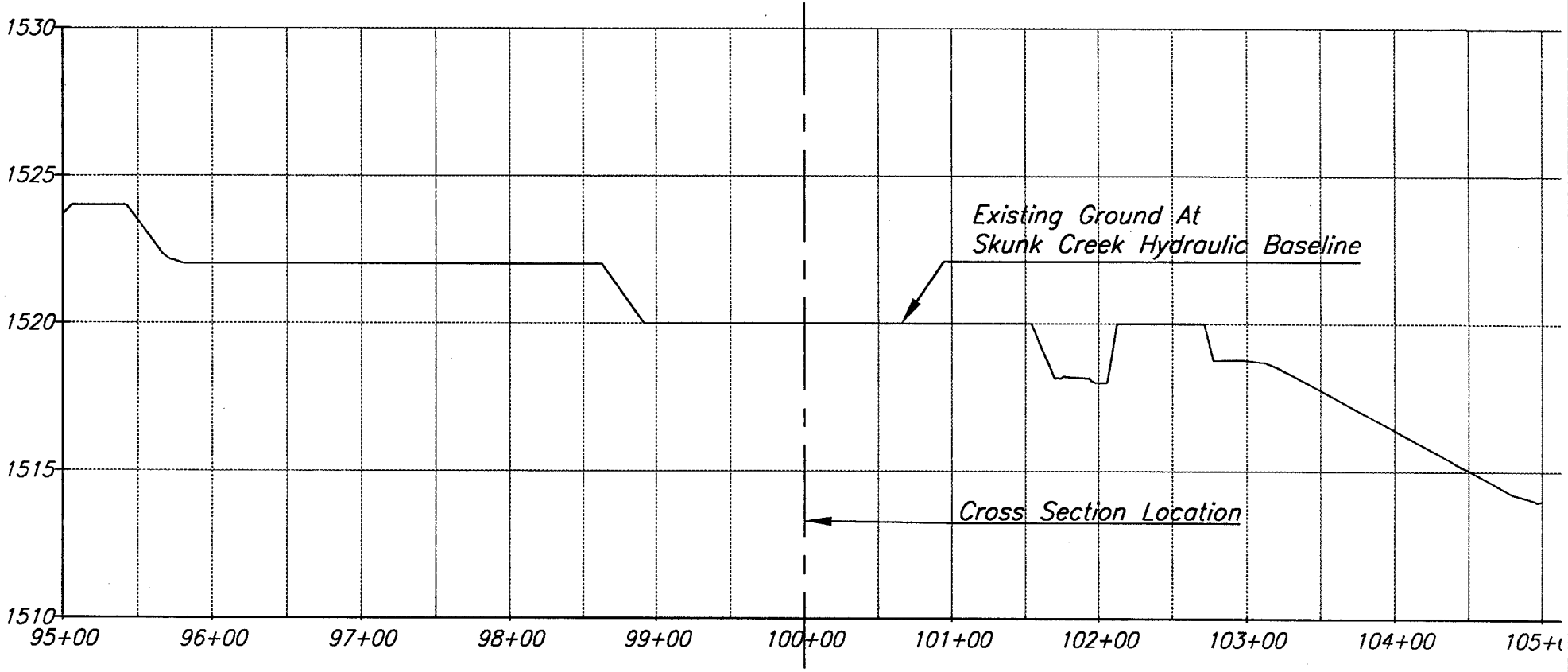
TETRA TECH, INC.
INFRASTRUCTURE SOUTHWEST GROUP

SKUNK CREEK
WATERCOURSE MASTER PLAN

JOB NO.	3300.0000
DESIGNED BY:	UIL
DRAWN BY:	CBC
CHECKED BY:	BBB
APPROVED BY:	BBB
DATE:	

FIGURE 10-5.2.10b
Monitoring Cross Section: 10
Baseline Cross Section

SCALE: HORIZ: 1"= 400'
CONT. INTERVAL =
DRAWING NO. MXS10
SHEET NO. 1 OF 3



Scale: Vertical 1"=5'

NO.	REVISIONS	DATE	BY	CHK.

BRIDGELINE

TETRA TECH, INC.
INFRASTRUCTURE SOUTHWEST GROUP

SKUNK CREEK
WATERCOURSE MASTER PLAN

JOB NO.	2360.0002
DESIGNED BY:	LKL
DRAWN BY:	CDC
CHECKED BY:	[illegible]
APPROVED BY:	[illegible]
DATE:	

FIGURE 10-5.2.10c
Monitoring Profile: 10
Baseline Data (December 1995)

SCALE: HORIZ: 1"= 100'
CONT. INTERVAL =
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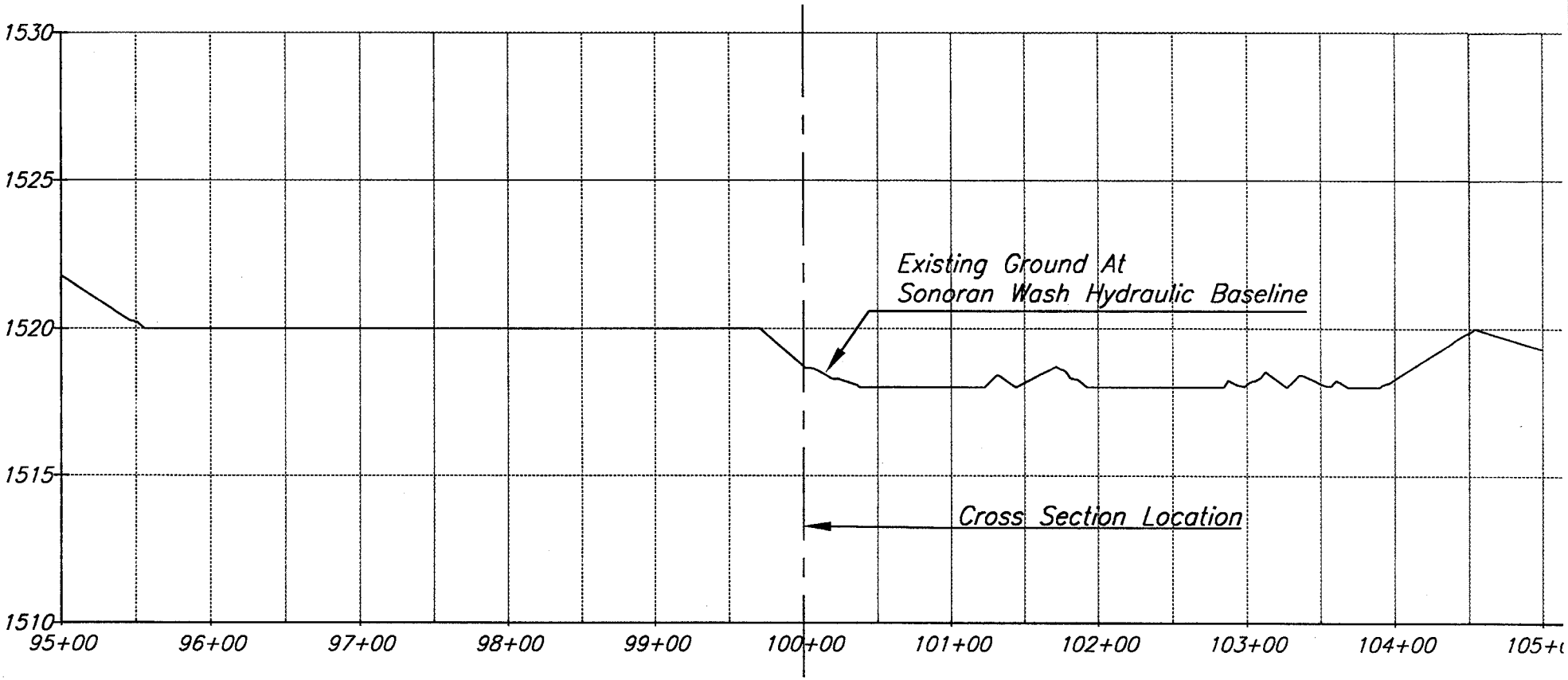
SHEET NO. 2 OF 3



Scale: Vertical 1"=8'

NO.	REVISIONS	DATE	BY	CHK.
APPROVALDWG				

TETRA TECH, INC.
INFRASTRUCTURE SOUTHWEST GROUP

SKUNK CREEK
WATERCOURSE MASTER PLAN

JOB NO.	2360.0002
DESIGNED BY:	LML
DRAWN BY:	CSC
CHECKED BY:	BBB
APPROVED BY:	BBB
DATE:	

FIGURE 10-5.2.10d
Monitoring Profile: 11
Baseline Data (December 1995)

SCALE: HORIZ: 1"= 100'
CONT. INTERVAL =
DRAWING NO. MPRO11
SHEET NO. 3 OF 3

SKUNK CREEK WATERCOURSE MASTER PLAN

ATTACHMENT 11

IMPLEMENTATION PLAN REPORT

Book 1 of 1

Prepared for:
Flood Control District of Maricopa County
2801 W. Durango Street
Phoenix, Arizona 85008
(602) 506-1501

Project FCD 99-23

Prepared by:
Tetra Tech, Inc.
Infrastructure Southwest Group
4801 E. Washington St., Ste. 260
Phoenix, Arizona 85034-2004
(602) 682-3300

Project Number 2350.002.01

August 2001

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Registered Professional Engineer (Civil) CERTIFICATE NO. 12739 THOMAS R. LOOMIS Date Signed 8/3/04 ARIZONA, U.S.A.

List of Exhibits

Exhibit 1: Map of Parcel Boundaries for Skunk Creek Watercourse Master Plan Phases 1 and 2

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Appendix D List of Structures Located within the Floodplain, Floodway and Erosion Hazard Zones for each Property
Appendix E Summary of Estimated Flow Rate and Recurrence Interval at Elevation of Finished Floor for Residences in Floodway and Severe Erosion Hazard Zone
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Appendix G Results Summaries from Individual Meetings with Property Owners (including handout materials)
Appendix H Letters to Property Owners

List of Acronyms and Abbreviations

ADMP	Area Drainage Master Plan
ADMS	Area Drainage Master Study
ADWR	Arizona Department of Water Resources
ALERT	Automated Local Evaluation in Real Time
ARS	Arizona Revised Statute
CAP Canal	Central Arizona Project Canal
COE	US Army Corps of Engineers
COP	City of Phoenix
District	Flood Control District of Maricopa County
EAS	Emergency Alert System
FEMA	Federal Emergency Management Agency
FLO-2D	FLO-2D computer program for two-dimensional hydraulic modeling
FWS	Flood Warning System
HEC-RAS	Hydrologic Engineering Center River Analysis System Computer Program
MSP	Flood Control District of Maricopa County Meteorological Services Program
NWR	NOAA Weather Radio
NWS	National weather Service
QPF	Quantitative Precipitation Forecast
Study Team	Tetra Tech, Inc, Stantec Consulting Inc, JE/Fuller Hydrology & Geomorphology, Inc., Logan Simpson Design, Inc., Flood Control District of Maricopa County, City of Phoenix.
WCMP	Skunk Creek Watercourse Master Plan

Summary

The Implementation Plan was developed to provide guidance for the District to implement the WCMP. The primary objectives for development of the Implementation Plan were to identify strategies for regulatory enforcement of the recommended *non-encroachment area*, guidance on appropriate uses for that area, and to identify allowable variances that may be granted for protection of personal property rights without jeopardizing public safety. These objectives are addressed in Section 11-2. The Team Alternative defines the recommended *non-encroachment area* for the Phase 1 study area. Implementation of the Phase 1 non-encroachment area is in progress by the COP, who has elected to establish a new "Flood Hazard and Erosion Management Zoning District" for enforcement of the recommended alternative. The permitted uses are listed in Section 11-2.1.

The Low-Impact Structural Alternative defines the recommended *non-encroachment area* for implementation by the District for the Phase 2 study area. The recommended implementation method is to adopt the non-encroachment area as an *Erosion Control Zone*, as defined in the Floodplain Regulations for Maricopa County. The District has not previously defined permitted uses and regulatory requirements for an *Erosion Control Zone*. Therefore, the recommended permitted uses and associated regulations are set forth in Section 11.2.2.

In addition to regulatory requirements, the Implementation Plan contains considerations and recommendations for addressing existing public safety issues identified during preparation of the WCMP. The most serious public safety issue identified during the preparation of the WCMP is the presence of existing residences within the *FEMA 100-year floodway* and/or the Severe Erosion Hazard Zone. To address this issue, two recommendations are made. The first is to prepare and adopt a Flood Warning Plan and to establish an interim Flood Warning System. The specifics of this recommendation are described in Section 11-3. The second recommendation is to adopt and implement a voluntary acquisition program for the residences located within the identified high-hazard areas. The properties recommended for acquisition and the recommended acquisition prioritization, are presented in Section 11-4. The interim Flood Warning System is recommended for discontinuance after the acquisition program is completed, whether or not the property owners elect to sell their property.

The other public safety issues are associated with three locations. The first is Skunk Creek at the Central Arizona Canal (CAP Canal) and Interstate 17 (I-17). Approximately 6,400 cfs breaks out to the west over I-17, during the 100-year flood as a result of flow constrictions at the CAP Canal overchutes for Skunk Creek and Sonoran Wash. The second is another flow breakout situation in Skunk Creek that occurs upstream of the New River Road Bridge. The third is Skunk Creek upstream of the watercourse master plan study area from New River Road Bridge to the Tonto National Forest boundary. There may be existing residences in the 100-year floodway in that reach of Skunk Creek. These three issues are described in more detail in Section 11-5. Recommendations are made to address these issues in the future Adobe Dam Area Drainage Master Plan, or other future studies.

Finally, recommendations are made regarding establishment of a monitoring and maintenance plan for the recommended alternatives for Skunk Creek and Sonoran Wash. The plan recommends monitoring and maintenance of existing and proposed structural components, and monitoring locations of potential channel adjustments that could affect the existing residences located in high-hazard areas, as described in Section 11-6.

SKUNK CREEK WATERCOURSE MASTER PLAN

ATTACHMENT 11
IMPLEMENTATION PLAN REPORT

11-1 Introduction

The Flood Control District of Maricopa County (District) teamed with the City of Phoenix (COP) to develop the Skunk Creek Watercourse Master Plan (WCMP) for Skunk Creek, and Sonoran Wash, which is a tributary of Skunk Creek. A *watercourse* master plan is a comprehensive flood management plan based on hydrologic and hydraulic analyses, lateral migration potential, future land use development, and environmental considerations. Historically, floodplain management within the COP and Maricopa County has not considered bank *erosion*, the potential long-term lateral movement of a *watercourse* over time, or future growth patterns within a watershed. The State of Arizona recently established Arizona Revised Statute (ARS) 48-3609.01 that enables local flood control agencies to identify sensitive *watercourses* for inclusive floodplain management through a process of *watercourse* master planning. The authority for preparation of this study and management of the Skunk Creek and Sonoran Wash *watercourses* is established in ARS 48-3609.1 and the Floodplain Regulations for Maricopa County (Maricopa County, 2000). The District contracted with Tetra Tech, Inc. who assembled a highly qualified team of subconsultants to assist in preparation of the WCMP in conjunction with District and COP staff (Study Team). Tetra Tech, Inc. managed the project, performed the hydrologic modeling, assisted with hydraulic and *erosion* analyses, identified and analyzed the management alternatives, and prepared the WCMP report. Tetra Tech, Inc. contracted with the firm of Stantec Consulting Inc. to perform most of the hydraulic and sediment transport modeling, JE Fuller/ Hydrology & Geomorphology, Inc. to perform the lateral stability analyses, and Logan Simpson Design Inc. to perform biological reconnaissance, delineate Waters of the United States, manage the public involvement process, and prepare final graphics.

The study area, shown on Figure 1, includes Skunk Creek from the Central Arizona Project Canal (CAP Canal) to about 2,200 feet north of New River Road, a length of about 13.2 stream miles. The study area also includes Sonoran Wash, a tributary *watercourse* that joins Skunk Creek approximately 0.5 miles downstream of the CAP Canal, and has a study length of about 3.3 stream miles. The study area is generally defined by perimeter 500 feet beyond the known 100-year floodplain of these *watercourses*, as determined by the Federal Emergency Management Agency (FEMA). Both Skunk Creek and Sonoran Wash have significant desert riparian vegetation. The potential exists for bank *erosion* and lateral migration of their *channel* banks to occur over time, particularly if vegetation along the banks is removed or disturbed by natural or human activities.

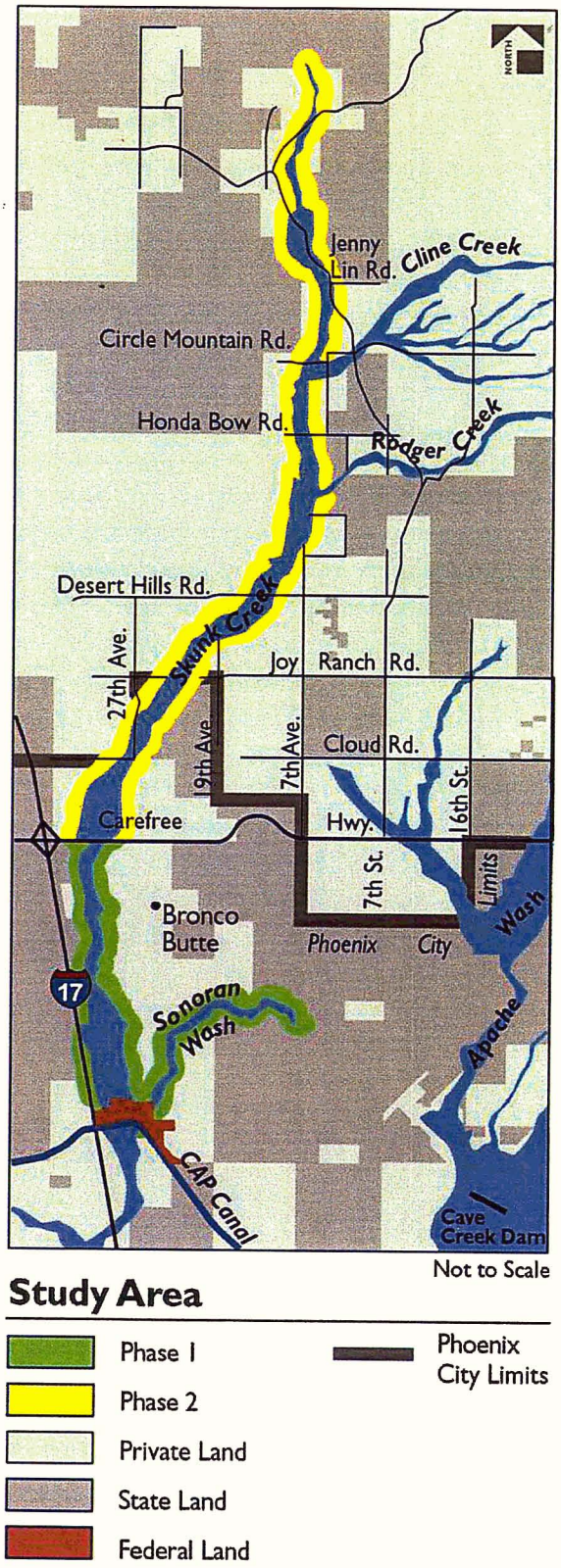

Figure 1: Study Area Map

The study was divided into two phases to accommodate a request by the COP to fast-track the area south of the Carefree Highway. Phase 1 consists of the study area between the CAP Canal and the Carefree Highway including Sonoran Wash, and Phase 2 covers the study area north of the Carefree Highway. Phase 1 lies within the area covered by the COP North Black Canyon Corridor Plan, adopted by the Phoenix City Council in July 1999. During the adoption of the North Black Canyon Corridor Plan, the Phoenix City Council directed COP staff to closely examine alternative approaches to flood control management in the corridor within a period of 12 to 18 months through a cooperative study with the District. Therefore, the Phase 1 study area was undertaken first, with completion scheduled for August 2000. The Study Team completed the Phase 1 technical and alternative analyses in May 2000, and the COP planning department staff published the Skunk Creek Water Course Master Plan Alternative Analysis report for Phase 1 on May 16, 2000. That report is included in Attachment 12 as Appendix F. The WCMP includes the results for Phase 1 as well as the results for Phase 2.

The recommended management plan for Phase 1 of the Skunk Creek WCMP is the Team Alternative. The Team Alternative achieved a total score of 39.8, as compared to scores of 26.6, 34.2, and 39.6 for the Full-Structural, Stakeholders, and Nonstructural Alternatives, respectively. This alternative achieved a total score of 20 and 19.8 out of a possible 25 points for Skunk Creek and Sonoran Wash, respectively. Although the margin is small over the Nonstructural Alternative, the Team Alternative is the most successful at meeting the WCMP goals. Key factors supporting the selection of the Team Alternative are that it allows use of private land within the *FEMA 100-year floodplain* without compromising public safety and it also meets the goals of the Sonoran Preserve Master Plan, and the North Black Canyon Corridor Plan. Selection of this alternative is also consistent with the alternatives analysis conducted by the COP (refer to Attachment 12- Alternatives Analysis Report, Section 12-7).

The recommended management plan for Phase 2 of the Skunk Creek WCMP is the Low-Impact Structural Alternative. The Low-Impact Structural Alternative achieved a total score of 20.3, as compared to scores of 11.8 and 19.9 for the Full-Structural and Nonstructural Alternatives, respectively. Although the margin is again small over the Nonstructural Alternative, the Low-Impact Structural Alternative is the most successful at meeting the WCMP goals. A key factor supporting the selection of the Low-Impact Alternative for Phase 2 of the study is the flexibility afforded to private landowners to reclaim land from the *FEMA 100-year floodplain*, while minimizing adverse impacts on the environment and the threat to public safety. Approximately 74 percent of the land in Phase 2 is privately owned.

This report describes the recommended strategies for implementation of the WCMP recommended alternatives. Many terms used in this report have definitions specific to the purpose of this study. There are also technical terms used that require definition. These terms are italicized, and defined in the glossary. The titles of documents and reports referenced herein are underlined. This report is an attachment document to the WCMP Technical Summary Report. Where an "attachment" report is referenced herein, it refers to one of the eleven other attachment reports that comprise the WCMP. A complete list of references for the WCMP is contained in Attachment 1, Data Collection Report.

This recommended Implementation Plan for the WCMP is developed to provide guidance for the District to implement the proposed management plan. The primary objectives for development of the Implementation Plan are to identify strategies for regulatory enforcement of the recommended *non-*

encroachment area, guidance on appropriate uses for that area, and to identify allowable variances that may be granted for protection of personal property rights without jeopardizing public safety. The criteria identified for regulations may be more stringent than that currently recommended by the Arizona Department of Water Resources (ADWR). In addition, the implementation plan contains considerations and recommendations for addressing existing public safety issues identified during preparation of the WCMP. The Implementation Plan includes the following recommended elements.

- Regulation of Recommended *Non-Encroachment Area.*
- Interim Flood Warning System.
- Acquisition Program for Residences in High-Hazard Areas
- Recommendations for the Adobe Dam Area Drainage Master Plan or other future studies.
- Recommendations for Establishing a Monitoring and Maintenance Program.

11-2 Regulation of Recommended Non-Encroachment Area

The implementation of the recommended *non-encroachment area* for both phases of the WCMP is critical to the successful management of the study *watercourses*. The critical aspects include public safety, minimizing future expenditures of public funds, and preservation of high-value wildlife habitat both within, and downstream of, the study area. Implementation strategies for each phase are discussed separately in the following sections.

11-2.1 Phase 1

Implementation of the Phase 1 *non-encroachment area* is underway by the COP. The method chosen by the COP for enforcement of the recommended *non-encroachment area* is establishment of a Flood Hazard and Erosion Management Zoning District. The Flood Hazard and Erosion Management District (FH) is intended to provide a new zoning category that will address the permitted use of land within areas that are prone to flooding or *erosion* hazards. It is further intended that *watercourses* be retained and maintained in a natural desert state to the greatest extent possible with flood control structures limited to the minimum necessary and designed to reflect a natural condition. In addition to the uses allowed within the FH district, proposals for the transfer of limited residential density and non-residential building area to locations outside the boundary of the FH district will also be permitted when the property is combined with adjacent land for development purposes. The permitted uses are as follows:

- Drainage and storm water conveyance, natural or limited structural (when deemed necessary and designed to reflect a natural condition).
- Open space, natural or unimproved (native landscape enhancements/restoration are permitted).
- Open space, improved – shall be limited to passive and active recreational activities including hiking/riding trails, exercise par courses, picnic areas and similar activities within a natural desert landscape. There shall be no game/sports courts or grassed areas. Structures shall be limited to security lighting, open fencing, shade structures, tables, seating, and exercise equipment which shall not impede storm water conveyance.

- Residential use – when the area covered by this zoning district is combined with an adjacent zoning district(s) outside the *non-encroachment area* for the purpose of residential development then residential use at a density not to exceed one dwelling unit per acre shall be permitted. The permitted density together with all structures, parking, and accessory uses, except as otherwise permitted by this district shall be transferred to the adjoining zoning district(s).
- Non-residential development – when the area covered by this zoning district is combined with an adjacent zoning district(s) outside the *non-encroachment area* for the purpose of non-residential development (including but not limited to commercial, office, industrial, public or quasi-public uses) then non-residential intensity at a floor area ratio (F.A.R. = gross building area to gross lot area) of 0.1 is permitted. The permitted F.A.R. together with all structures, parking, and accessory uses, except as otherwise permitted by this district shall be transferred to the adjoining zoning district(s).
- Accessory uses:
    1. Utilities - which shall be limited to wash crossings only; all installations shall be protected against *scouring*.
    2. Roadway/bridge crossings.

11-2.2 Phase 2

The recommended *non-encroachment area* for Phase 2, outside the City of Phoenix, can be enforced through the following methods:

- Establish a Flood Hazard and Erosion Management Zoning District, similar to that being implemented by the COP for Phase 1.
- Regulate the *non-encroachment area* outside the *FEMA 100-year floodway* as an *Erosion Control Zone* in conformance with the Floodplain Regulations for Maricopa County.
- Re-map the *non-encroachment area* within the *FEMA 100-year floodplain* as *FEMA 100-year floodway* and regulate accordingly.

Two of the three possible enforcement methods to be described are not desired by the District. The establishment of a Flood Hazard and Erosion Management Zoning District is possible, but is not the method preferred by the District staff. The entire Phase 1 area is undeveloped, and slated for subdivision-type land uses. Phase 2 is for the most part already broken up into privately owned parcels with a maximum land use density of predominately 1 dwelling unit per acre. Large subdivision-type developments are not expected to occur in the study area. Therefore, an implementation option that respects personal property rights as much as possible without sacrificing public safety is preferred. The regulation of the entire *non-encroachment area* as if it were a *FEMA 100-year floodway*, while maximizing public safety, minimizes use of the land by private property owners, and is therefore not preferred. The option to regulate the *non-encroachment area* outside the *FEMA 100-year floodway* as an *Erosion Control Zone* is the preferred implementation method by the District, and also recommended herein.

The District added the *Erosion Control Zone* designation to the Floodplain Regulations for Maricopa County in the 2000 revision. There are no formal policy statements written for regulation of this zone as of the writing of this WCMP. Therefore, the following are the recommended regulation policies for allowable uses specific to the WCMP for administration of the *Erosion Control Zone*, and

correspondingly, the recommended *watercourse* management *non-encroachment area* (it is understood that the area inside the *FEMA 100-year floodway* shall be regulated in accordance with the existing Floodplain Regulations for Maricopa County):

- Drainage and storm water conveyance, natural or limited structural (when deemed necessary and designed to reflect a natural condition).
- Open space, natural or unimproved (native landscape enhancements/restoration are permitted).
- Open space, improved – shall be limited to passive and active recreational activities including hiking/riding trails, exercise par courses, picnic areas and similar activities within a natural desert landscape. Game/sports courts or grassed areas are allowed, including equestrian arenas. Structures shall be limited to security lighting, open fencing, pole barns, shade structures, tables, seating, and exercise equipment which shall not impede storm water conveyance.
- Residential use – Residences are not encouraged in this area, but may be permitted if the following conditions are met:
    1. The structure does not impede stormwater conveyance or result in *cumulative impacts*. *Cumulative impacts* are to be measured in terms of the percent increase in peak discharge resulting from *floodplain encroachment* and may not exceed the values listed in Table 1 for the Low-Impact Structural Alternative, without an approved substantiating study. Consideration shall be given to conveyance exchange with allowable *floodplain encroachments* outside the *Erosion Control Zone* on the same property.
    2. The foundation of the structure is designed by a structural engineer licensed to practice in the State of Arizona to withstand the effects of floodwaters and *erosion* assuming the *main channel* migrates to the residence. The foundation shall extend below the adjacent *main channel* thalweg elevation to a depth equal to the maximum design *scour* depth listed in Table 2 for the *reach* in question. Lesser depths may be accepted with an approved substantiating study.
- Accessory uses:
    1. Utilities - which shall be limited to wash crossings only or to service a permitted residence or outbuilding; all installations shall be protected against *scour* and *erosion*.
    2. Roadway/bridge crossings.

Residences constructed within the *FEMA 100-year floodplain*, but outside the *Erosion Control Zone*, shall be constructed with either:

1. The foundation extended to a 3-foot depth below existing ground and constructed of reinforced masonry or concrete materials.
2. The foundation constructed on fill materials compacted to 95% of maximum dry density and the entire fill area protected with bank protection extending a minimum of 3-feet below existing ground.

Table 1: Summary of Management Alternative Testing for Cumulative Impacts

Location	HEC-1 Concentration Point	Watercourse Management Alternative							
		Nonstructural		Full-Structural		Stakeholders		Low-Impact (Team)	
		Q (cfs)	% Change	Q (cfs)	% Change	Q (cfs)	% Change	Q (cfs)	% Change
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Skunk Creek, upstream of CAP Canal									
Skunk Creek at Fig Spring Road	S3C	4,899	0.0%	4,899	0.0%	4,899	0.0%	4,899	0.0%
Skunk Creek at New River Road bridge	S6C	7,840	0.0%	7,840	0.0%	7,840	0.0%	7,840	0.0%
Skunk Creek at RM 24.74	S10C	8,219	0.0%	9,676	17.7%	9,676	17.7%	8,476	3.1%
Skunk Creek upstream of Cline Creek	S13C	10,174	0.0%	11,802	16.0%	11,802	16.0%	10,176	0.0%
Skunk Creek downstream of Cline Creek	S14C	22,622	0.0%	24,170	6.8%	24,170	6.8%	22,655	0.1%
Skunk Creek downstream of Rodger Creek	S16C	24,429	0.0%	26,571	8.8%	26,571	8.8%	24,566	0.6%
Skunk Creek at Skunk Tank	S21C2	23,830	0.0%	26,410	10.8%	26,410	10.8%	24,329	2.1%
Skunk Creek at Carefree Highway	S22C	22,603	0.0%	25,908	14.6%	25,901	14.6%	23,582	4.3%
Skunk Creek at CAP Canal	S23L	20,830	0.0%	23,155	11.2%	22,770	9.3%	21,234	1.9%
Sonoran Wash									
Sonoran Wash at RM 3.54	C002	6,492	0.0%	6,492	0.0%	6,492	0.0%	6,492	0.0%
Sonoran Wash at RM 2.69	C003	8,431	0.0%	8,467	0.4%	8,609	2.1%	8,460	0.3%
Sonoran Wash at RM 1.77	C007	9,398	0.0%	10,480	11.5%	10,370	10.3%	9,656	2.7%
Sonoran Wash at CAP Canal	C010	9,114	0.0%	10,247	12.4%	10,131	11.2%	9,293	2.0%
Skunk Creek, downstream from CAP Canal									
Skunk Creek & Sonoran Wash at CAP Canal	CAP	21,426	0.0%	24,341	13.6%	23,896	11.5%	22,213	3.7%
Skunk Creek Downstream of CAP Canal	CAPR2	21,271	0.0%	24,059	13.1%	23,626	11.1%	22,013	3.5%
Skunk Creek at I-17	S24C	21,270	0.0%	24,059	13.1%	23,626	11.1%	22,013	3.5%

Table 2: Design Scour Depths for Skunk Creek Phase 2 by Reach

Reach Name (1)	Total Design Scour in feet		
	Minimum (2)	Maximum (3)	Average (4)
Skunk Creek Carefree Reach	3.1	6.7	5.5
Skunk Creek Skunk Tank Reach	3.0	7.7	4.6
Skunk Creek Cobbled Bank Reach	3.0	7.2	4.6
Skunk Creek Rodger Creek Reach	3.0	11.2	5.4
Skunk Creek Cline Creek Reach	3.5	8.5	5.6
Skunk Creek Shang-ri La Reach	3.0	6.8	4.1
Skunk Creek New River Road Reach	3.0	9.5	3.8

11-3 Interim Flood Warning System

Now that the floodway limits have been mapped, District staff may propose, as one component of the implementation strategy for the WCMP, the establishment of a flood warning system for Skunk Creek between Cloud Road and the upper limit of the Phase 2 study area located about 2,200 feet upstream of the New River Road Bridge. The purpose of the system is early detection of flooding events that could damage the existing residences within the *FEMA 100-year floodway* and/or Severe Erosion Hazard Zone. This information could be used to warn residents of an impending flood and trigger evacuation notices. This flood warning plan and system is considered an interim measure because it would be phased-out by the acquisition program described in Section 11-4. Any proposed acquisition program will be voluntary. If acquisition offers were made, the flood warning system for individual residences would be terminated:

1. After the property owner accepting the acquisition offer is moved out, or
2. After the property owner rejects the acquisition offer.

The District has maintained and operated a rain gage and a streamflow gage in the Phase 2 study *reach* of upper Skunk Creek since 1981 and 1995, respectively. Those gage data, in combination with rainfall and streamflow data from gages located downstream at the I-17 crossing of Skunk Creek, are used by the District to support the following functions:

- Flood Warning. The primary flood warning use of the Skunk Creek gages has been to provide data for evaluating the performance and safety of Adobe Dam, located downstream. Additionally, the collected data provide advisory information in support of road closure decisions during flood events.

- Data Collection/ Archive. The data continue to be incorporated into rainfall and streamflow databases maintained by the District. These databases provide critical data for the design and evaluation of engineered structures in the Skunk Creek watershed as well as elsewhere around Maricopa County and the State of Arizona.

District staff report that the existing flood warning system has been adequate, thus far, in meeting the flood warning needs in the Skunk Creek watershed as described above. However, since June 1995 when the "Skunk Creek near New River" streamflow gage was installed, no extreme flood events have occurred. However, in consideration of the potential impacts to structures and roadway crossings in the Phase 2 study area, and the flood warning needs for larger floods occurring in this area, a more comprehensive investigation was conducted.

11-3.1 Flood Warning System Needs Assessment

The necessary elements of the Skunk Creek Flood Warning System (FWS) are assessed by:

- Considering the information provided by the Districts' existing Automated Local Evaluation in Real Time (ALERT) sensor detection network in the watershed.
- Comparing the flow rate at which overbank flooding occurs with the precipitation necessary to produce that flow rate.
- Determining the locations of structures and road crossings in the floodway, floodplain and Severe Erosion Hazard Zone.
- Examining the travel time to these locations from existing streamflow gages as well as the approximate frequency of the beginning of inundation at these locations.

The results of the assessment indicate that the primary need for flood warning in the Skunk Creek watershed is for closure of at-grade road crossings. A secondary need for larger floods is the warning and evacuation of structures that are located within the Skunk Creek floodway and those structures located outside the floodway, but within the Severe Erosion Hazard Zone. The relatively quick basin response time of streams in the Skunk Creek watershed and the somewhat remote location of the area limit the nature of, and means for, flood warning. Finally, development within the downstream portions of the study area may change the flood warning needs as future development proceeds. Flood warning needs should be reevaluated as development occurs.

11-3.2 Flood Warning System Components

An effective flood warning system is the combination of several vital components. The first component is the ability to detect and evaluate a flood threat in its early stages and make a decision to warn people before flood damages or personal injuries occur. The second component is the dissemination of the warning to the public at risk. The third component is the public response to the warning. The following is a brief description of the each of these components relative to the Skunk Creek FWS.

11-3.2.1 Flood Detection

The earliest recognition of a potential flood threat for the Skunk Creek basin will be the forecast products available from the District and the National Weather Service (NWS). The Precipitation Outlook (PO) forecast provided by the Flood Control District of Maricopa County Meteorological Services Program (MSP) provides a daily assessment of the flooding potential of the atmosphere and a basin-specific Quantitative Precipitation Forecast (QPF). The MSP also provides a series of flood alert messages of increasing severity and urgency. The MSP service supplements standard NWS forecast products, and the flash flood watch and flash flood warning messages issued by the NWS. MSP forecasts and messages are comparatively more site-specific to the Skunk Creek watershed. District MSP messages are coordinated with the NWS Weather Forecast Office in Phoenix. Depending on staffing and personnel assigned by the District, District flood alert messages and NWS flash flood watches and flash flood warnings could be issued in an agreed upon sequence for areas impacted by flooding along Skunk Creek.

The automated rain gages and stream gages in the Skunk Creek basin and adjacent watersheds transmit rainfall data and real-time streamflow measurements to ALERT base stations located at the District and NWS. The effectiveness of the Skunk Creek FWS is highly dependent upon adequate rainfall and streamflow data collected and transmitted by the sensors comprising the flood detection network for the Skunk Creek watershed. Therefore, one new streamflow gage and three new rainfall gages are scheduled to be installed to supplement the existing rainfall and streamflow gages on Skunk Creek near New River (#5580 and #5583, respectively). The new streamflow gage is planned for Cline Creek, a major tributary that joins Skunk Creek downstream of the existing streamflow gage. In addition, a new rainfall gage will be co-located at this site. One new rain gage is planned for each of the upper watersheds of Skunk, Cline, and Rodger Creeks. These new gages should substantially improve the hydrologic data available for the District to support decisions concerning road closures and can trigger the flood response plan action protocols that are based upon pre-determined flood detection criteria and sensor threshold alarms.

A new stream gage was proposed for Rodger Creek. There is only one viable site that meets the requirements of access and accurate flow measurements. The site is on privately owned property, and the property owners declined to allow the District to construct a gage on their property.

11-3.2.2 Information Dissemination

An interim program to disseminate flood warning messages to the public and to emergency response agencies is recommended to the District, and could be accomplished using NOAA weather radios and pagers. Notification via multiple paths is provided for redundancy and robustness of the FWS. The NWS will issue warning messages to the public via:

- Emergency Alert System (EAS). The system consists of radio and television broadcast stations in the Phoenix operational area that are responsible for disseminating emergency information and warnings to the public (voluntary).

- NOAA Weather Radio (NWR). NWS issues flash flood watch and flash flood warning messages via NOAA Weather Radio according to a standard protocol using tone alarms followed by voice messages.

The District's program would then send flood alert messages via text pager to residents in the Skunk Creek floodway and Severe Erosion Hazard Zone, as appropriate. The message would be sequenced into the NWS flash flood watch and flash flood warning message suite.

11-3.2.3 Flood Response Plan

The recommended response component of the Flood Response Plan (FRP) consists of three primary elements:

- Flood Response Plan Report. The FRP Report includes information relative to flood vulnerability, flood detection, information dissemination, emergency response agency actions, post-flood actions, and training exercises. The report is to be used by the District and other emergency response agency personnel.
- Flood Response Plan Menu. The FRP Menu is for use by the individual residents in the Skunk Creek floodway and Severe Erosion Hazard Zone. The FRP Menu includes a list of flood detection/prediction messages that will be received by the residents via NWR or pager. These messages trigger actions required by the affected individuals. The menu also includes maps showing evacuation routes and destination sites.
- Technical Memorandum. The Technical Memorandum includes documentation of the meteorological analysis, and the hydrologic and hydraulic modeling results as they relate to the estimation of hydrologic lead-times for the *watercourse*. It also includes assumptions regarding decision times and action times used in preparation of the FRP. Refer to Appendix A for a copy of the Flood Warning Plan Technical Memorandum.

11-4 Alternative Project To Address Residences in High-Hazard Areas

A very important component of the implementation plan is recommendations for addressing the possible public safety issues identified during the study. The most important of these is the residences that exist within the *FEMA 100-year floodway* and/or the Severe Erosion Hazard Zone, an example of which is shown on Figure 2. There are a total of 9 site-built residences and 8 mobile residences within the *FEMA 100-year floodway* of Phase 2, located on a total of 12 parcels of land. There is also 1 site-built residence and 2 mobile residences within the Severe Erosion Hazard Zone, but outside the *FEMA 100-year floodway* of Phase 2, on 3 parcels of land. In addition, the Shangri La Resort has several temporary travel trailers and mobile homes that are outside the *FEMA 100-year floodway* but within the Severe Erosion Hazard Zone. These 20 residences and the Shangri La Resort trailers are located in a very dangerous setting where lives could be lost and property severely damaged during flood events. Many residences are within *erosion* hazard areas where structures are in danger of being damaged and/or washed away. All the residences are subject to flow depths and velocities that are capable of sweeping a person off their feet and carrying them downstream.

Records show that these residences were permitted for construction prior to the original delineation and subsequent re-delineation of the existing *FEMA 100-year floodplain* and *floodway* in 1987 and 1997, respectively. The owners of these parcels of land now find themselves living in what is now identified as a very dangerous location, and they will probably be unable to sell their property without disclosing that new building permits cannot be obtained. Pursuant to Flood Control District regulations, they cannot rebuild if their residence burns down or suffers damage greater than 50% of the appraised value. One way to address the problem is to include these 16 parcels of land in a voluntary acquisition or relocation-on-site program by Maricopa County. The purchased structures would be demolished and the land returned to as natural a condition as possible.

This alternative to any structural project would benefit the owners and also the County by providing a high degree of public safety because residents would be removed from high-hazard areas. Consideration should be given to relocation of the existing homes to safer locations on the same parcel wherever possible. This is possible for Assessors Parcels 202-21-024B, 202-21-013M, 202-21-145, and 202-21-031Q. The owner of Assessors Parcel 202-21-024B has expressed an interest in taking that approach. None of the other three property owners have been contacted in this regard, so an acquisition option is used to define the estimated cost of the program for those parcels. The remaining parcels are recommended for inclusion in an acquisition program because there is insufficient land on the parcel in a safe area to accommodate relocation. The trailers on the 36-acre Shangri La Resort are present under a conditional floodplain use permit. It is recommended that all habitable structures on that parcel within the Severe Erosion Hazard Zone be relocated to a safer area on the parcel.

The locations of the properties proposed for purchase are shown on Figure 3. The recommended priority for purchase or relocation-on-site of each of the 16 parcels of land, should the alternative acquisition project be approved by the District's Board of Directors, is shown in Table 3. The priority is based on the relative hazards between parcels using the residence in the most hazardous situation on each parcel. The hazard assessment used to establish priorities is based on the information in columns 10 through 13. In column 10, the relative hazards associated with the three *erosion* hazard zones are accounted for by assigning each residence an erosion hazard multiplier, as follows:

Figure 2: Existing Residence in FEMA 100-year Floodway and Severe Erosion Hazard Zone

- "3" multiplier: Residence within the Severe Erosion Hazard Zone.
- "2" multiplier: Residence within the Lateral Migration Erosion Hazard Zone.
- "1" multiplier: Residence within the Long-Term Erosion Hazard Zone.

The estimated percent chance within any given year that floodwaters will enter a residence, or flow under a mobile residence, is listed in column 11. Column 12 lists a personal hazard factor that represents a relationship between depth of flow and velocity at the residence during the 100-year flood peak. A value greater than 18 in column 12 means there is sufficient depth and velocity of flow to sweep a person (child or elderly) off their feet. This is based on relationships between depth and velocity developed by the US Bureau of Reclamation (USBR, 1988) and refined by Pima County, AZ (Pima County, 1999). Column 13 lists a multiplier used to account for personal safety hazards associated with flood warning/emergency response time. The multiplier is directly related to the amount of time between: 1) the most intense precipitation occurring on the watershed, and 2) when the flow in the area of the residence reaches a hazardous level (finished floor elevation or ground elevation under mobile residences). Item 1 represents the first opportunity for the flood warning system

administrator or other designated individual to "see" sufficient precipitation occurring on the watershed to warrant issuing an evacuation notice (various increasing levels of flood warning notices would probably already have been sent). The difference between items 1 and 2 is the time available to issue the evacuation notice, and for residents to receive the notice, react and leave the area. The personal hazard multiplier is assigned based on the time differential, as follows:

- "5" multiplier: 1 hour or less.
- "4" multiplier: Between 1 and 3 hours.
- "3" multiplier: Between 3 and 6 hours.
- "2" multiplier: Between 6 and 12 hours.
- "1" multiplier: Greater than 12 hours.

All the residences listed in Table 1 have flood warning response times of less than 1 hour, and in fact are less than 35 minutes. The personal safety hazard is extremely high for flood warning response times of less than 35 minutes. This is one of the prime reasons why an alternative project acquisition program is recommended for these properties. The hazard ranking values listed in columns 14 are the product of the factors in columns 10 through 13. The higher the value in column 14, the higher the relative hazard for the parcel. The acquisition priorities are assigned by sorting the parcels from highest relative hazard to lowest using column 14.

Data to support a recommended prioritization for acquisition or on-site relocation is contained in Appendices B through F. Appendix B contains lists of property ownership information for the study area. Refer to Exhibit 1 for a depiction of the parcel boundaries for Phases 1 and 2. The parcel TAG numbers listed in Appendices B through F are shown on Exhibit 1. Appendix C contains a list of the areas of *FEMA 100-year floodplain* and *floodway*, the *Erosion Control Zone*, and all three *erosion* hazard zones for each parcel. Parcels located entirely within the *FEMA 100-year floodway*, the *Erosion Control Zone*, or both are identified in that appendix. Appendix D contains a list of all structures located within the *FEMA 100-year floodplain* and floodway, and the three *erosion* hazard zones. The estimated 100-year water surface elevation and the finished floor elevation at the structure are also listed for the structures in the *FEMA 100-year floodway* and the Severe Erosion Hazard Zone. Appendix E contains a list of the estimated flow rates, and the associated *recurrence intervals* of those flow rates, corresponding to the finished floor elevations of existing residences or the ground elevations under mobile homes. This information is compiled for existing structures on the parcels that have residences located within the *FEMA 100-year floodway* or the Severe Erosion Hazard Zone as of March 2001. Also listed is the overbank velocity and flow depth at the structure. This information was used to estimate the personal hazard factor discussed above. Appendix F contains ranking matrices for residences in the *FEMA 100-year floodway* and the Severe Erosion Hazard Zone. One matrix is based on probability of flooding, and one is based on flow depth. These matrices were used the development of the acquisition prioritization procedure.

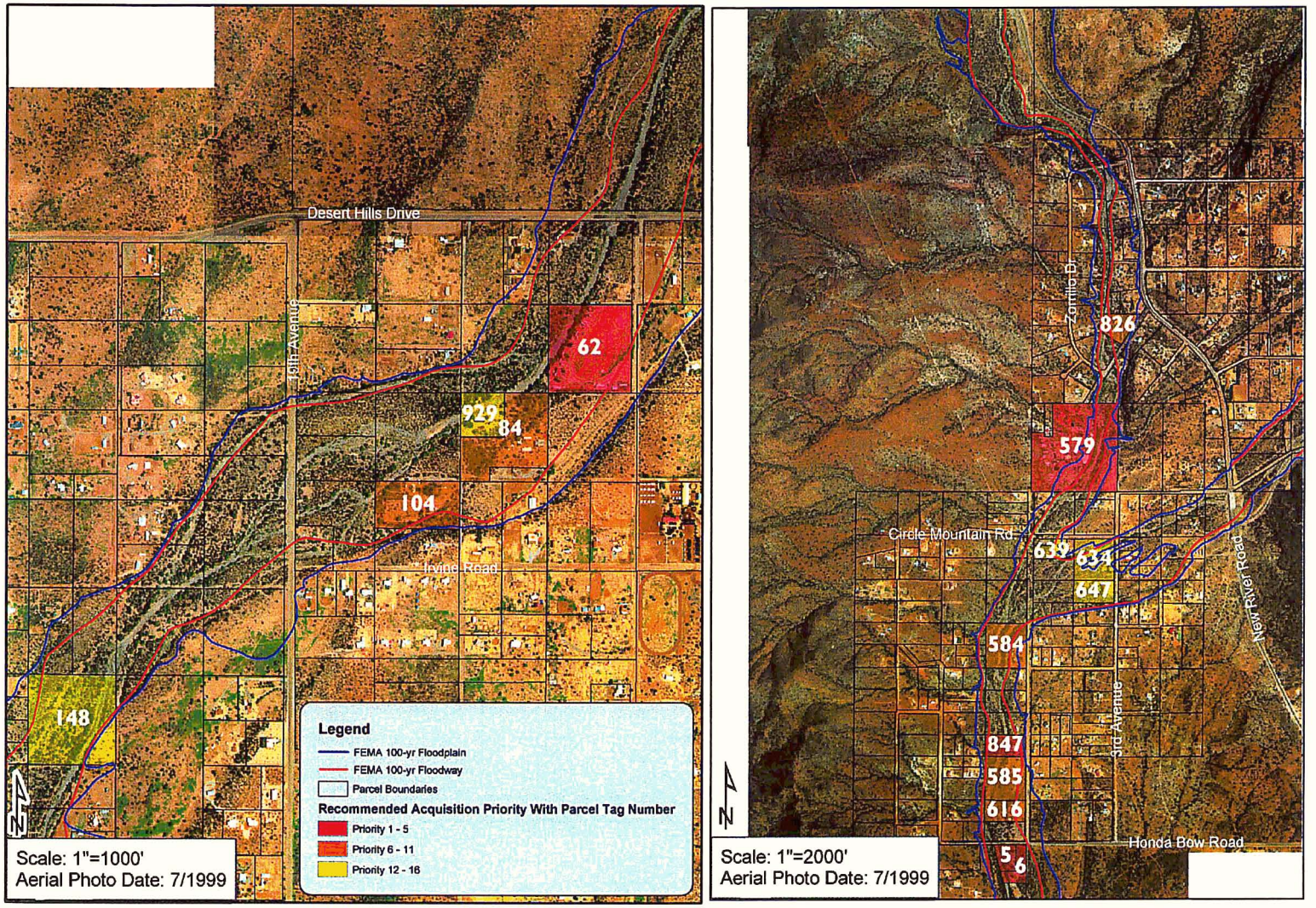

Figure 3: Location of Parcels Recommended for Inclusion in the Acquisition Program

Table 3: Prioritization for Acquisition of Residences

Tag ID (1)	Assessors Parcel Number (2)	Rec. Buy-Out Priority (3)	Parcel Area acres (4)	Year Built (5)	Hazard Assess. Done On (6)	In F/W (7)	In Sev EHZ (8)	In LM EHZ (9)	Erosion Hazard Multiplier[1] (10)	Approx. Chance of Flooding[2] (11)	Personal Hazard Factor[3] (12)	Response Time Factor[4] (13)	Hazard Ranking Value (10)*(11)*(12)*(13) (14)
5	211-22-002B	1	2.5	1985	House	Y	Y		3	20.0%[5]	76	5	22800.0
847	202-21-169	2	4.5	1988	House	Y	Y		3	20.0%	52	5	15600.0
62	211-50-022	3	9.6	n/a	Mobile 3	Y			1	20.0%	59	5	5900.0
579	202-21-008T	4	36.4	n/a	Mobile	N	Y		3	16.7%	22	5	5511.0
6	211-22-002J	5	3	1981	Mobile	Y	Y		3	6.3%	35	5	3281.3
104	211-50-037C	6	5.2	1980[6]	Mobile	Y		Y	2	8.3%	36	5	3000.0
84	211-50-016J	7	6.5	n/a	Mobile 1	Y			1	9.1%	54	5	2454.5
616	202-21-024B	8	4.5	1976	House	Y		Y	2	7.7%	31	5	2384.6
826	202-21-150	9	3.9	1996	Mobile	N	Y		3	7.7%	13	5	1501.5
584	202-21-013M	10	9.4	1970	House	N	Y		3	2.4%	21	5	750.0
585	202-21-013R	11	9.2	1976	House	Y		Y	2	2.9%	15	5	441.2
634	202-21-031C	12	8.7	n/a	House	Y			1	2.5%	34	5	425.0
929	211-50-016H	13	2.5	n/a	Mobile	Y	Y		3	1.4%	5	5	105.6
647	202-21-032A	14	4.7	1976	House	Y			1	1.1%	5	5	27.5
639	202-21-031Q	15	2.7	1960	House	Y	Y		3	1.0%	0	5	0.0
148	203-32-006	16	10.2	n/a	Mobile	N	Y		3	<1.0%	0	5	0.0

[1] "1" for outside Severe and Lateral Migration EHZ's, "2" for within Lateral Migration EHZ, and "3" for within Severe EHZ.

[2] Represents the percent chance of flood water entering a house, or flowing under a mobile, in any given year.

[3] Represents flow depth times velocity squared at the residence during the 100-year flood.

[4] Accounts for personal safety related to time between the most intense precipitation and the time for flood peaks to reach the residence.

"1" for > than 12 hours, "2" for > 6 to 12 hours, "3" for 3 to 6 hours, "4" for 1 to 3 hours, "5" for <1 hour.

[5] 20.0% Estimates are based on a field survey of actual finished floor elevations.

[6] 1980 is the year the house was constructed. The year the mobile was set is unknown.

11-5 Recommendations for the Adobe Dam Area Drainage Master Plan

There are a few areas of concern for Skunk Creek and Sonoran Wash, identified during the WCMP, which warrant detailed analysis that is beyond the scope of this study. It is recommended that these concerns be added to the scope of work for the upcoming Adobe Dam Area Drainage Master Plan. The areas of concern are identified below, and discussed in the following sections.

- New River Road Bridge Area.
- Skunk Creek between the WCMP north study limits and the Tonto National Forest Boundary.
- CAP Canal and I-17 Flow Breakout.
- Watershed issues.

11-5.1 New River Road Bridge Area

A unique problem was identified while conducting the Phase 2 hydraulic, sediment transport, and *scour* analyses on Skunk Creek in the vicinity of the New River Road Bridge. This bridge, which is located in the middle of the New River Road Reach, at the upstream end of the Phase 2 study area, is a 367-foot, 5-span, continuous concrete slab, built in 1995. The bridge was built on an extreme skew to the Skunk Creek *channel* (60 degrees) in an area where the 100-year floodplain is shallow and very wide (approximately 1700 feet). Presumably to reduce cost, yet provide sufficient conveyance area to pass the 100-year discharge under the bridge, the Skunk Creek *channel* was abruptly widened from approximately 30 feet to 180 feet in the immediate vicinity of the bridge, with no transition back to the natural *channel* geometry downstream. This dramatically reduced the sediment transport capacity of the *channel* at this location, especially for the more frequent storm events, and has resulted in significant sediment deposition at the bridge since its construction. The deposition is so significant that the entire excavated area in-fills with sediment to the level of the original overbank, reducing the conveyance area to the point where the bridge effectively acts like a dam under high flow rates, forcing more flow out of the *channel* than would occur naturally. Constant maintenance to remove the deposited sediment is and will continue to be required to minimize the aggravated flooding problems at the site. Two photographs of the New River Road Bridge illustrate this problem. The photograph labeled Figure 4 was taken during maintenance operations in July 2001 to remove sediment deposition that has occurred in the right-of-way since the last maintenance operation. The second photograph labeled Figure 5 depicts how low the bridge is in relation to the downstream overbank area. This downstream constriction creates a backwater condition that limits the hydraulic capacity of the bridge and contributes to the sediment deposition problem.

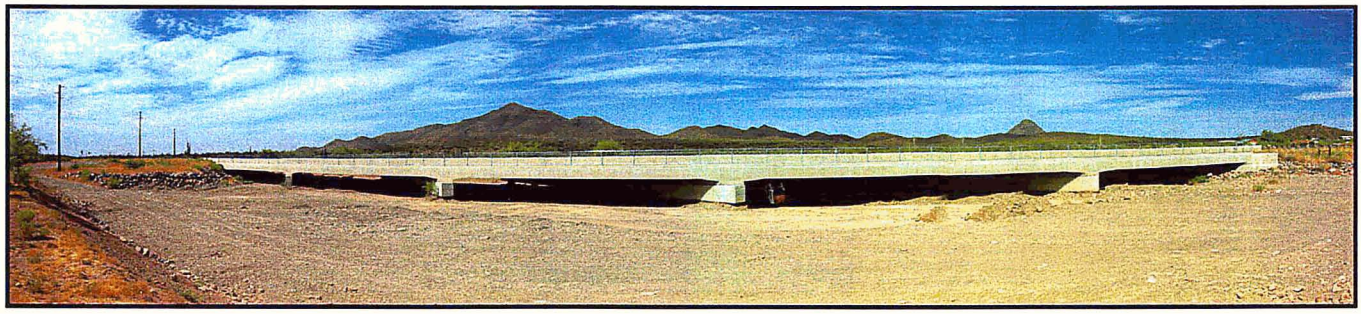

Figure 4: New River Road Bridge

Figure 5: West Side of New River Road Bridge

A cursory investigation into potential solutions to this problem was conducted during the WCMP. Among them is the construction of levees to contain the 100-year discharge and force it through the bridge, along with various combinations of *channel* improvements at and downstream of the bridge. Because of natural outcrops of caliche and bedrock downstream of the bridge, acting as grade control, it was concluded that the *channel* would continue to aggrade at the bridge site during frequent storm events even with the levees. The possibility of removing the natural grade control and increasing the *channel* slope to increase sediment transport capacity through and downstream of the bridge site was also briefly investigated. However, it was concluded that approximately 2000 feet of expensive "hard" excavation would be required to achieve this.

Another situation is identified upstream of the New River Road Bridge. The FEMA hydraulic model is built with the assumption that the majority of the flow is contained in the main channel and is conveyed to the bridge. It was acknowledged by FEMA that a breakout occurs along both main channel banks upstream of the bridge, and that adjacent areas are flooded. However, the adjacent areas are mapped as

areas subject to flooding depths of only about 1 foot. Cursory investigation reveals that actual breakout flow rates may be significant, and the adjacent areas may be subject to more frequent flooding. A split flow analysis for both the east and west main channel banks was done using HEC-RAS. The breakout peak flow rate during the 100-year flood over the east bank is approximately 200 cfs. The breakout peak flow rate during the 100-year flood over the west bank is estimated to range from 4,000 cfs to 4,500 cfs, over one-half of the total peak flow rate of 7,800 cfs. The west bank breakout begins at approximately a 10-year frequency. The breakout over the west bank overtops New River Road north of the bridge at the location shown in Figure 6.

Further investigation to identify possible solutions to these problems is beyond the scope of the WCMP. However, because of the complexity of the problems, the poorly defined *hydraulics* at the site, and the potential cost of not taking action (flood damage and maintenance), it is highly recommended that an independent study be undertaken to identify feasible actions and develop a recommended solution for implementation. A possible side benefit of a solution may be a reduction in the *erosion* hazard area in the vicinity of the bridge, especially in the west overbank area. An in-depth study to identify possible solutions to the problem should include the following tasks:

- Prepare new topographic mapping of the area at a scale of 1 inch=100 feet, a contour interval of 1 foot, and a DTM grid spacing of 25 feet. Include ortho-rectified color aerial photographs of the study area.
- Develop and evaluate a minimum of three alternative solutions to the problem, including removal and replacement of the bridge, and defining a method to prevent the breakout of flow over the east and west banks upstream of the New River Road Bridge.
- Conduct a detailed two-dimensional flow hydraulic analysis on the New River Road Reach over the full range of discharges (Q_2, Q_{10}, Q_{25} and Q_{100}) for existing conditions, pre-bridge conditions, and for each alternative solution considered.
- Investigate the need for mapping a 100-year floodway for the breakout flow over the west bank upstream of the New River Road Bridge. Include definition of a floodway for the Skunk Creek tributary from sub-basin S-7 that combines with the breakout flow.
- Prepare a personal safety hazard assessment for the existing residences in the flow breakout area, if any are identified, similar to that done for the residences in the floodway as a part of the WCMP. Consider recommendation for an alternative project acquisition program.
- Conduct a detailed sediment transport analysis of the New River Road Reach over the full range of discharges for existing conditions, pre-bridge conditions, and for each alternative solution considered.
- Conduct an equilibrium slope and armoring analysis over the full range of discharges for existing conditions, pre-bridge conditions, and for each alternative solution considered.
- Conduct a subsurface investigation to identify the location of bedrock, caliche and other potential geologic control features through the *reach*.
- Perform sediment gradation testing of surface and subsurface sediments every 500 feet through the *reach*.
- Evaluate the impact of each alternative on local *scour* at the bridge and the capacity of the bridge foundations over the full range of discharges considered.
- Evaluate the impact of each alternative on the limits of the *erosion* hazard zones, as identified and established by this master plan study.

- Provide sufficient plan drawings and conceptual details to describe the alternatives being evaluated.
- Provide a final summary report with cost estimates for the alternatives and recommend an alternative for further development and implementation.

Figure 6: Skunk Creek Flow Breakout Area at New River Road Bridge

11-5.2 Skunk Creek between the north study limits and the Tonto National Forest Boundary

The WCMP north study limit ends at a point 2,200 feet upstream of the New River Road Bridge over Skunk Creek. The WCMP study was not extended north to the Tonto National Forest boundary because detailed topographic mapping is not available for the entire area of that *reach* of Skunk Creek. During the course of the WCMP study, it was noted that there is a high potential for existing residences to be located within the 100-year floodway of Skunk Creek and its tributaries upstream of the WCMP study area. The upstream *reach* is also subject to *erosion* hazards similar to the lower *reaches*. It is recommended that the WCMP be extended north to the Tonto National Forest boundary for the purpose of defining *erosion* hazard areas, verifying the presence of existing residences in high-hazard locations,

and supplying information to those residents. This work could be done under the Adobe Dam Area Drainage Master Plan. The recommended work tasks to be performed, at a minimum, include:

- Topographic Mapping. Prepare new topographic mapping as required to supplement the existing mapping available from the District. Mapping and surveying are to be according to the District's latest guidelines and have a minimum contour interval of 2-feet.
- Existing Condition Floodplain Delineation. Delineate the existing condition 100-year floodplain and floodway for Skunk Creek between the north WCMP study limits and the Tonto National Forest boundary. Coordinate the new floodplain and floodway limits with the results of the Topographic Mapping and Floodplain Delineation Study for Tributaries to Skunk Creek.
- Finished Floor Elevations. Survey the finished floor and adjacent ground elevations of all existing residences within the 100-year floodplain.
- Erosion Hazard Zones. Delineate the severe and lateral migration *erosion* hazard zone for the study area using a methodology similar to that used for the WCMP.
- Hazard Assessment. Prepare a hazard assessment rating for each residence located within the 100-year floodway and the Severe Erosion Hazard Zone using a methodology similar to that used for the WCMP.
- Low-Impact Structural Management Plan. Define a *non-encroachment area* based on the Lateral Migration Erosion Hazard Zone, in conformance with the approach used for the WCMP.
- Public Involvement. Conduct a public notification and input process regarding the results of the floodplain/floodway delineation, the *erosion* hazard zones and the Low-Impact Structural Management Plan. Conduct individual meetings with property owners of residences in high-hazard areas for the purpose of informing them of the hazards.
- Implementation. Define an implementation strategy for regulating the Low-Impact Structural Management Plan *non-encroachment area* in a manner that is compatible with the WCMP implementation plan.

11-5.3 CAP Canal and I-17 Flow Breakout

An important public safety hazard was identified where Skunk Creek and Sonoran Wash cross the CAP Canal at the south study limit of the WCMP adjacent to I-17. During the development of the hydraulic modeling for the WCMP, the area immediately upstream of the CAP Canal where Skunk Creek and Sonoran Wash commingle could not be accurately modeled using a one-dimensional flow model such as HEC-RAS. It was found that a breakout occurs at that location because of the flow constriction caused by limited hydraulic capacity of the Skunk Creek and Sonoran Wash overchutes at the CAP Canal. This breakout results in stormwater being diverted west over I-17, and the CAP Canal overchutes being overwhelmed by discharges from floods more frequent than the 26-year event. Refer to Figure 7. Since this breakout has the potential to flood existing residences that were previously thought safe, as well as residences currently under construction, and to cause failure of the CAP Canal embankment, a detailed hydraulic analysis of the breakout became necessary to accurately define the problem. A two-dimensional flow model of this area was developed for the purpose of estimating the extent, frequency and magnitude of breakout flows and the CAP Canal overtopping flows. The FLO-2D computer model was used. In summary, flow begins to breakout over I-17 at an estimated 26-year flood frequency (12,500 cfs in Skunk Creek). The estimated peak discharge over I-17 during the *100-year storm* is 6,400 cfs, with a total breakout volume of approximately 76,800 *acre-feet*. The estimated average flow depth

over I-17 during the 100-year event is 2.5 feet. Refer to Attachment 7 of the Technical Summary Report for complete details of the two-dimensional hydraulic model results.

The possible consequences of the breakouts in this area include:

- Flooding of new developments west of I-17 previously thought to be safe from Skunk Creek.
- Isolation of areas flooded by Skunk Creek in the New River area from vehicular emergency response units that must access the area using I-17.
- Possible flooding of new developments east of Skunk Creek and south of the CAP Canal.
- Damage to, or failure of, the CAP Canal embankments.

It is recommended that this problem area be studied in more detail, that the areas of possible flood inundation west of I-17 be mapped, that alternative methods of solving the breakout problem be defined and analyzed, and that a solution be recommended. The following is the recommended scope of work for key tasks associated with the proposed project:

- Data Collection. Collect and review pertinent data from the District and other outside sources. Data to be collected shall include previous flood hazard reports and *hydrology* for the study area; existing topographic mapping; historical flooding information; as-built plans for existing structures; FEMA Flood Hazard Boundary Maps and any Letters of Map Amendment and/or Revisions.
- Topographic Mapping. Prepare new topographic mapping as shown on Figure 8 to supplement the existing mapping available from the District. Mapping and surveying are to be accomplished according to the District's latest guidelines.
- Existing Condition Modeling. Delineate the 100-year floodplain west of I-17 resulting from the Skunk Creek breakout using two-dimensional hydraulic modeling methods and interface the results with the two-dimensional model prepared as a part of the WCMP in Attachment 7.
- Prepare, analyze and evaluate alternative solutions to include:
    1. Widen the CAP Overchutes. Widen the CAP overchutes on Skunk Creek and Sonoran Wash to safely convey the respective 100-year floods. Establish the minimum width required.
    2. Extend the existing Levee System. Extend the existing levee system along Skunk Creek and Sonoran Wash to contain the 100-year, 24-hour peak discharge. Establish the location and geometry of the additional levees.
    3. Combination of 1 and 2. Determine the optimum combination of overchute widths and levee heights needed to safely contain and pass the 100-year peak discharge.
- Predevelopment Condition Model. Investigate historical data and establish a predevelopment condition model to show the conditions of Skunk Creek prior to development within the study area, including construction of the CAP Canal.

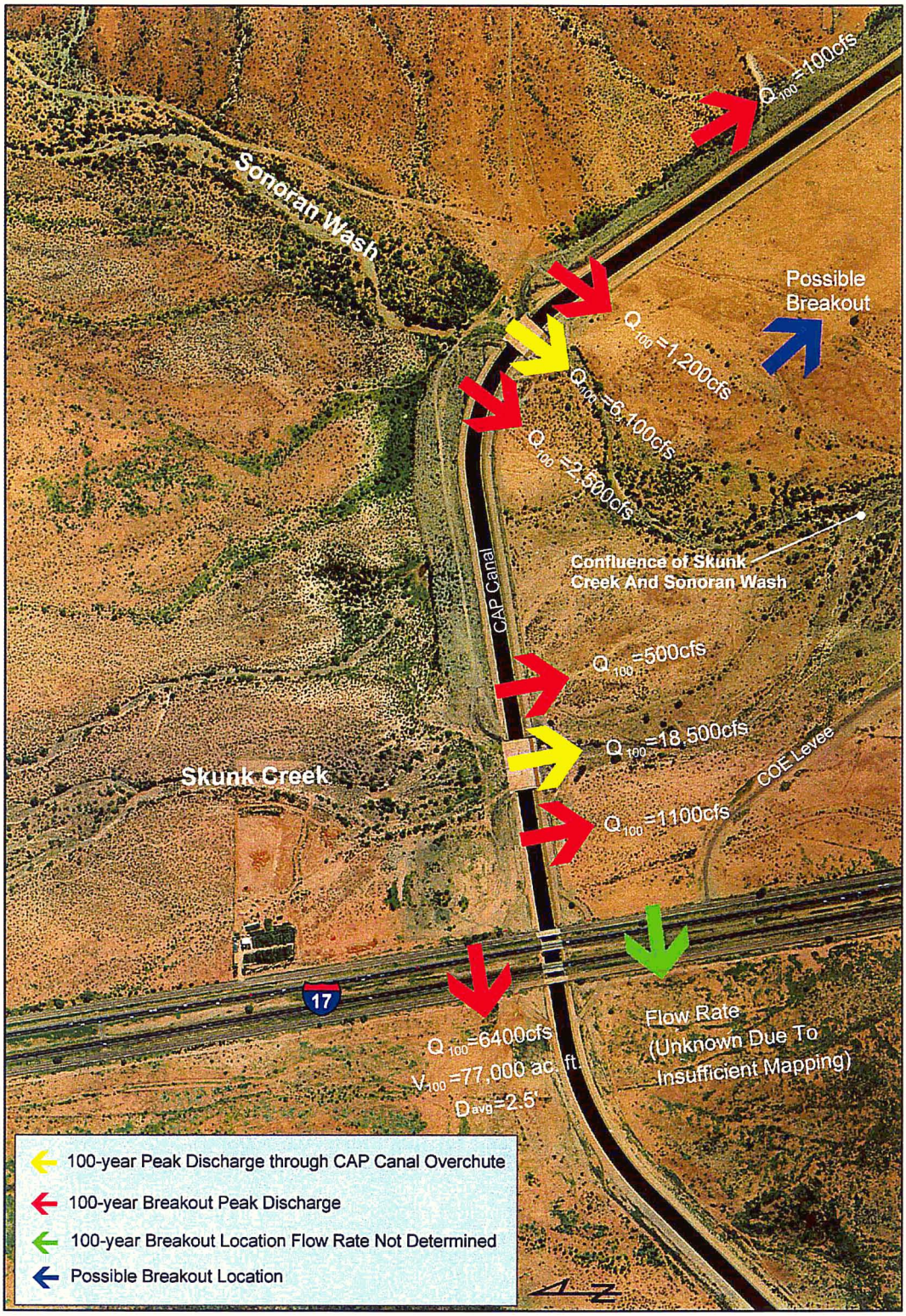

Figure 7: Skunk Creek Flow Breakout Area at I-17 and CAP Canal

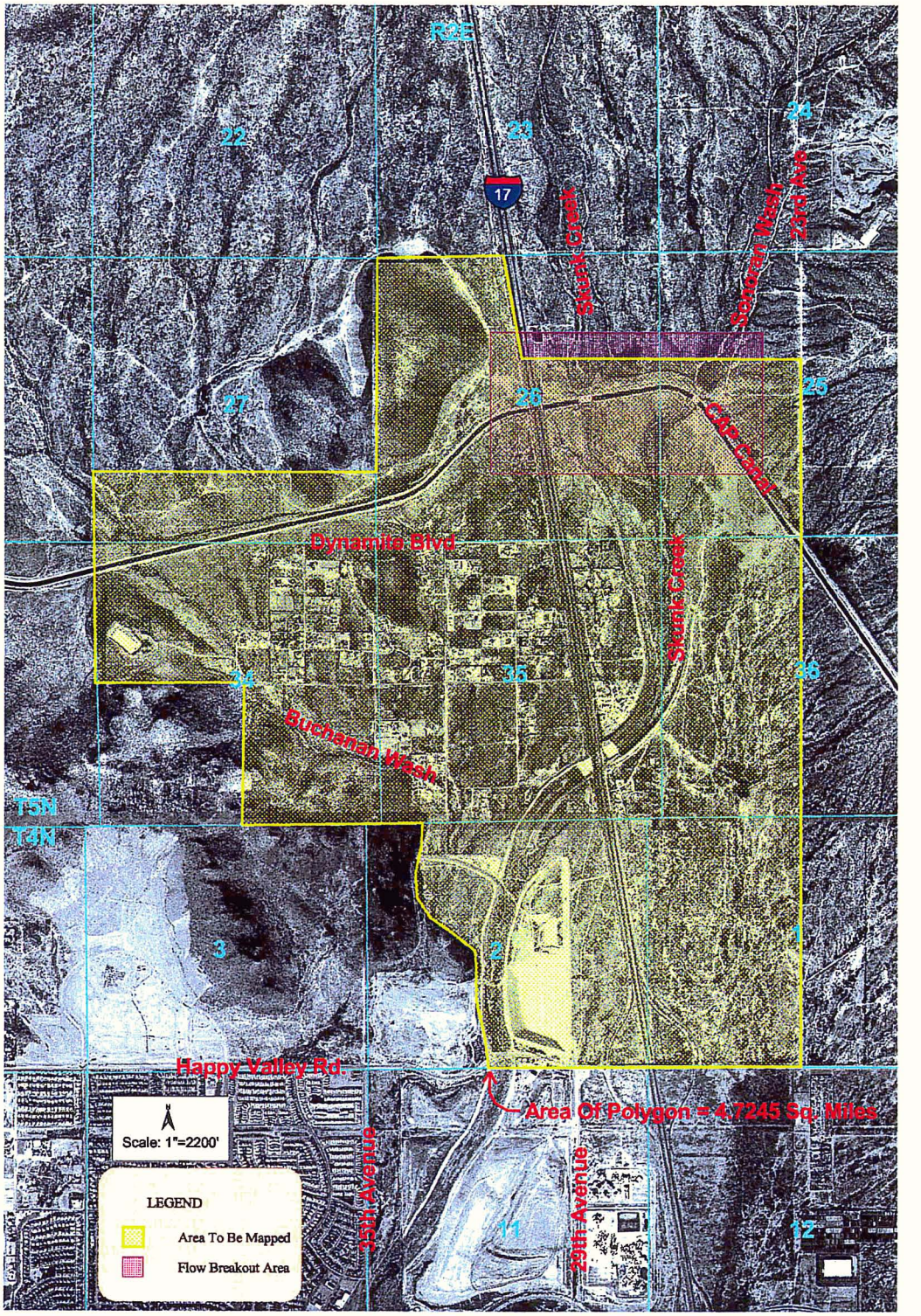

Figure 8: Recommended Area of New Mapping at I-17 and CAP Canal

11-5.4 Watershed Management

The ADMP should address the following watershed management issues:

- Identify the *watercourses* to be preserved. Define *watercourses* where channelization or *floodplain encroachment* may be necessary, and verify that resulting travel times through the watershed still match existing natural conditions as closely as possible.
- Refine existing watershed management guidelines so that sediment loads in the natural *watercourse* system do not increase or decrease significantly as a result of development or other human disturbances. Where significant changes may result, identify appropriate mitigation measures for implementation by developers to maintain long-term *watercourse* stability.
- Refine existing management methods to maintain peak discharges for the 2-, 10- and *100-year storms* at or below the *future watershed condition* levels estimated in the WCMP.
- Refine methods to maintain the release of future condition runoff volumes to the *watercourses* from the 2-, 10- and *100-year storms* as close as possible to the WCMP estimated *existing watershed condition* runoff volumes. Coordinate this with the previous item. This approach is necessary to meet the goal of minimizing changes to *sediment yield*, and to support natural riparian vegetation along the *watercourses*.
- Strongly support implementation of the North Black Canyon Corridor Plan and the MAG 1995 General Land Use Plan for the watershed.

11-6 Recommendation for a Monitoring and Maintenance Program

At the present time the WCMP remains only a plan, and there is no way to predict when or if any of the structural elements discussed in this report may be implemented. Until there are changes to the natural *watercourse* the District may choose to adopt none or only a few of the monitoring and maintenance plan elements presented in Attachment 10 of the WCMP. After, or if, a management plan for the study *watercourses* is adopted by the Flood Control District Board of Directors, a monitoring and maintenance plan specific to the adopted *watercourse* management plan is recommended. Such a plan, built around the draft plan described in Attachment 10, could be implemented over a five to ten year period as development progresses in the study area, and District budget allows. Finally, it is recommended that new information and discoveries that become available during the implementation period be used to update the monitoring and maintenance plan components, as appropriate.

11-7 Glossary

100-year Storm. A storm with a 100-year *recurrence interval.* The 100-year storm for the study area results from 5.0-inches of precipitation within a 24-hour period. The 2-year and 10-year storms result from a 24-hour precipitation of 2.3-inches and 3.4-inches, respectively.

Acre-feet. An *acre-foot* of sediment is an acre of land covered by sediment 1 foot deep.

Channel. For the purpose of this study, a channel is defined as the portion of a cross section of a watercourse that carries stormwater. A channel is characterized by its bed and banks. The channel bed is made up of sand, gravel and/or cobbles. The channel banks may be heavily vegetated or have exposed soils. A watercourse cross section can have multiple channels. These channels may vary in elevation in relation to each other.

Cumulative Impacts. For the purpose of this study, cumulative impacts are a decrease in public safety, or an increase in cost to the public, within, upstream or downstream of the WCMP study area, resulting from implementation of a proposed management alternative. The key indicator for determining the existence of cumulative impacts is an increase in peak discharge resulting from floodplain encroachment. A change in peak discharge, increasing in the downstream direction as a result of floodplain encroachment, typically results in increases in flow depth and velocity, and adversely affects the sedimentation and erosion characteristics of the watercourse. These effects can jeopardize existing structural flood control improvements or result in increased damage to property. Cumulative impacts have the effect of increasing the cost of floodplain management to the public.

Erosion. For the purpose of this study, erosion is defined as the natural process of flowing water removing soil, sand, gravel, or cobbles within a watercourse. Erosion has the effect of changing the watercourse geometry and increasing conveyance capacity. Erosion occurs naturally along all watercourses, but can be accelerated by human activities such as removal of bank vegetation, sand and gravel mining, or urbanization.

Erosion Control Zone. A land area adjoining a body of water or adjacent to or located partially or wholly within a delineated floodplain which due to the soil instability, is likely to suffer flood-related erosion damage. The Severe and Lateral Migration Erosion Hazard Zones comprise the Erosion Control Zone for the WCMP.

FEMA 100-year Floodplain. The FEMA 100-year floodplain is defined by FEMA as an area that is flooded by a 100-year recurrence interval storm. The area so defined is based on existing watershed and watercourse conditions at the time of the study. It does not include the effects, over time, of erosion and sedimentation in the watercourse.

FEMA 100-year Floodway. The FEMA 100-year floodway is defined by FEMA as an area that is reserved for conveyance of floodwaters, in which buildings or other obstructions are not allowed. The FEMA 100-year floodway limits are established by determining the amount of fill that can be placed in the 100-year floodplain without increasing the 100-year depth of flow by more than 1-foot.

Floodplain Encroachment. Floodplain encroachment, as defined by FEMA, means that development, including residential or commercial improvements, could be constructed within the FEMA 100-year floodway fringe. This could be accomplished using fill to raise building floor elevations above the FEMA 100-year floodplain elevation, or constructing levees to isolate the FEMA 100-year floodway fringe from the FEMA 100-year floodway.

Hydraulics. For the purposes of this project, hydraulics is defined as the study of the ability of the watercourse to carry storm water. The hydraulic models are used to estimate the depth, width, velocity, energy, and travel time of flow through the study area.

Hydrology: For the purposes of this project, *hydrology* is defined as the study of surface water runoff from the contributing watersheds. The *hydrology* models are used to estimate watershed runoff volumes and peak flow rates in relation to time during storm events, for both existing and future conditions.

Main Channel. The main channel is defined as a channel that is continuous throughout the watercourse and carries the most flow.

Non-Encroachment Area. For the purpose of this study, a non-encroachment area is the area within a watercourse management alternative where floodplain encroachment is not allowed. The uses permitted within the non-encroachment area are:

- Drainage and stormwater conveyance, in an undisturbed desert state.
- Open-space, unimproved (undisturbed desert with native landscape enhancements/restoration permitted).
- Open-space, improved (limited to passive and active recreational activities including hiking/riding trails and similar activities within a desert landscape).
- Homes or other structures may be constructed within this area, outside the FEMA 100-year Floodway, provided the structure and its foundation is designed to withstand the forces which may be imposed upon it by floodwaters, erosion, sedimentation and channel migration, to the satisfaction of the District. It must also be proven that the structure or structures will not result in cumulative impacts, or negatively impact adjacent properties. The design must be prepared and sealed by a professional civil or structural engineer licensed to practice within the State of Arizona.

Reach. For the purpose of this study, a reach is defined as a length of watercourse in which watercourse characteristics are similar. Reaches can be defined based on hydrologic, hydraulic or geomorphologic similarities, or on similarities in biologic, visual, or landscape characteristics.

Recurrence Interval. A *recurrence interval* storm or flood is defined as a storm or flood that has a specific probability of occurring within any given year. For example, the 100-year recurrence interval storm or flood has a 1 % probability of being equaled or exceeded in any given year. The other two recurrence interval storms or floods considered in this study are the 2-year (50 % probability) and 10-year (10 % probability).

Scour. For the purpose of this study, scour is defined as a lowering of the channel bed by erosion. Scour occurs at natural or man-made obstructions to flow, or at channel banks. Examples of natural

obstructions are trees in the channel, or constrictions in the channel. Man-made obstructions include bridge piers and grade-control structures.

Watercourse. For the purpose of this study, a watercourse is defined as the entire length of a wash to be studied, including the width necessary for the watercourse to function naturally. This includes the watercourse channels, over-bank floodplains, and the area the watercourse has occupied in recent geologic time (<10,000 years).

11-8 References

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Appendix A

Flood Warning Plan

Technical Memorandum

SKUNK CREEK FLOOD RESPONSE PLAN

TECHNICAL MEMORANDUM

Prepared For:

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

Prepared By:

Tetra Tech, Inc.
Infrastructure Southwest Group
4801 E. Washington Street, Ste. 260
Phoenix, AZ 85034
(602) 682-3300

In association with:

JE Fuller/ Hydrology & Geomorphology, Inc.
6101 S. Rural Road, Suite 110
Tempe, AZ 85283
(480) 752-2124

August 2001

NOTE:

THE USER SHOULD READ THE ENTIRE FRP CAREFULLY AND SHOULD BE AWARE OF ALL ELEMENTS OF THIS PLAN, INCLUDING STRENGTHS AND WEAKNESSES, AND INDIVIDUAL RESPONSIBILITIES. THE FLOOD WARNING/ RESPONSE PLAN PRESENTED HEREIN, AND IN THE FIELD BOOK AND FRP RESIDENT MENUS, IS USEFUL AS ONE STEP IN DEVELOPING A FLOOD WARNING SYSTEM FOR THE RESIDENTS WITHIN THE SKUNK CREEK WARNING AREA. HOWEVER, THE POSSIBILITY OF INADVERTENT ERROR IN DESIGN OR FAILURE OF EQUIPMENT TO FUNCTION EXISTS AND MAY PREVENT THE SYSTEM FROM OPERATING PERFECTLY AT ALL TIMES. THEREFORE, NOTHING CONTAINED HEREIN MAY BE CONSTRUED AS A GUARANTEE OF THE SYSTEM OR ITS OPERATION, OR CREATE ANY LIABILITY ON THE PART OF ANY PARTY OR ITS DIRECTORS, OFFICERS, EMPLOYEES OR AGENTS FOR ANY DAMAGE THAT MAY BE ALLEGED TO RESULT FROM THE OPERATION, OR FAILURE TO OPERATE, OF THE SYSTEM OR ANY OF ITS COMPONENT PARTS. THIS CONSTITUTES NOTICE TO ANY AND ALL PERSONS OR PARTIES THAT THE NATIONAL WEATHER SERVICE, FLOOD CONTROL DISTRICT OF MARICOPA COUNTY, MARICOPA DEPARTMENT OF EMERGENCY MANAGEMENT, MARICOPA COUNTY DEPARTMENT OF TRANSPORTATION, MARICOPA COUNTY SHERIFF'S OFFICE, DAISY MOUNTAIN FIRE DEPARTMENT, RURAL METRO FIRE DEPARTMENT, TETRA TECH, INC., AND JE FULLER/ HYDROLOGY & GEOMORPHOLOGY, INC. OR ANY OFFICER, AGENT OR EMPLOYEE THEREOF, SHALL NOT BE LIABLE FOR ANY DEATHS, INJURIES, OR DAMAGES OF WHAT EVER KIND THAT MAY RESULT FROM RELIANCE ON THE TERMS AND CONDITIONS OF THIS SYSTEM.

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Registered Professional Engineer (Civil) CERTIFICATE NO. 14720 PATRICIA QUINN DESCHAMPS Date Signed 8/29/01 ARIZONA U.S.A.

Registered Professional Engineer (Civil) CERTIFICATE NO. 32833 JEFFREY A. DESPAIN Date Signed 8/29/01 ARIZONA, U.S.A.

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FILES ON CD-ROM

DESCRIPTION	FORMAT
Skunk Creek Watershed Map	AutoCAD R14 drawing
Hydraulic Analysis Work Map	AutoCAD R14 drawing
Hydraulic Analysis Files	HECRAS
Hydrologic Analysis Files	HEC-1
FRP Technical Memorandum	Word document
FRP Field Book	PDF format

SECTION 1: INTRODUCTION

1.1 Purpose

One component of the implementation strategy for the Skunk Creek Watercourse Master Plan (WCMP), a project authorized by the Flood Control District of Maricopa County (District or FCDMC) FCD 99-23, is the establishment of a flood warning system for Skunk Creek. The purpose of this system is early detection of flooding events that could damage the existing residences within the FEMA 100-year floodway and Severe Erosion Hazard Zone. This information could be used to warn residents of impending floods and trigger evacuation notices.

This flood warning plan and system would be considered only an interim measure because it is to be phased-out by a buy-out/ relocation program. Any proposed buy-out program will be voluntary. If buy-out offers are made, it is anticipated that the flood warning system for individual residences would be terminated after those accepting the offer are moved out.

1.2 Project Location

The Skunk Creek study area is located in northern Maricopa County, Arizona. Residences included in the FRP warning area are located in unincorporated areas, but portions of the downstream study area are within the City of Phoenix corporate boundary. See Figure 1-1 for a location map and Figure 1-2 for a vicinity map.

1.3 Flood Response Plan Components

This document contains the Flood Response Plan (FRP) and supporting technical documentation. Hydrologic and hydraulic models are provided on CD-ROM. Two exhibit maps are also provided on the CD as AutoCAD files. These include a watershed map that shows the HEC-1 subbasins and concentration points, and a hydraulic work map with HECRAS cross-section locations.

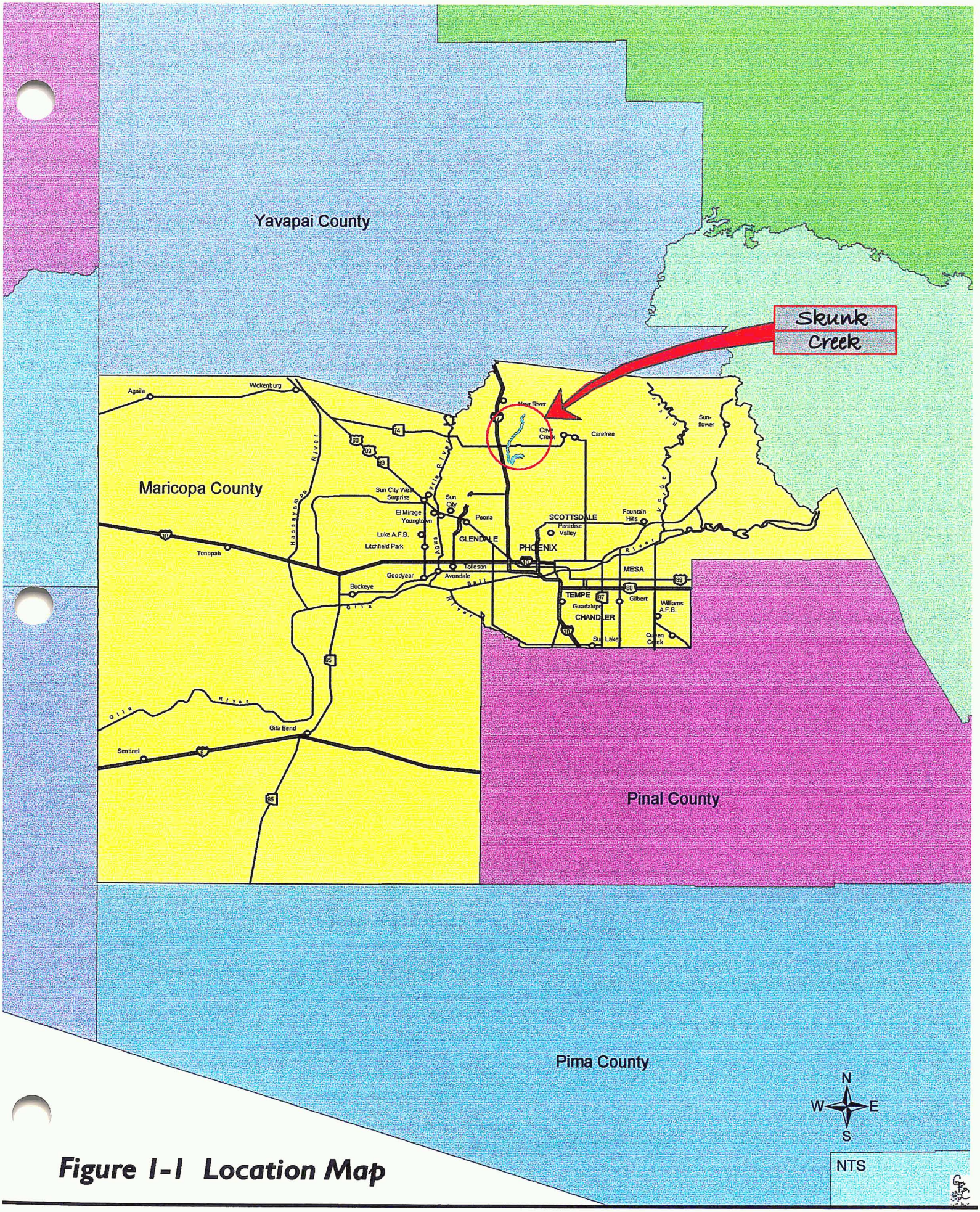


Figure 1-1 Location Map

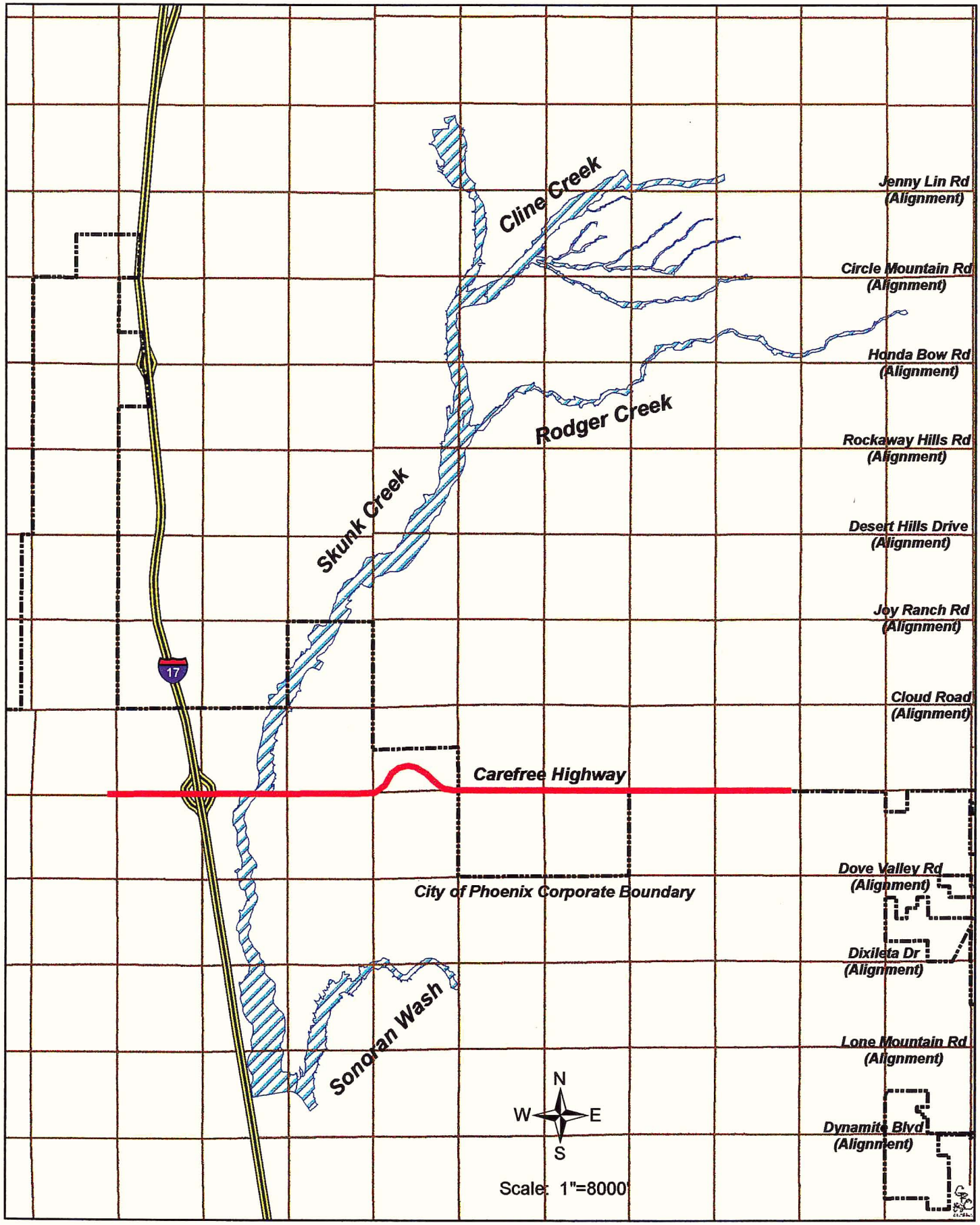


Figure 1-2 Vicinity Map

The FRP is intended to stand on its own and to be added as an Appendix to the District's Flood Emergency Response Manual. The Flood Response Plan is comprised of three primary components, including a Technical Memorandum, FRP Field Book, and FRP Menus.

Technical Memorandum

This document is the Technical Memorandum and is intended for use by District Flood Warning Branch and Meteorological Services Program (MSP) personnel to support decisions regarding dissemination of flood alert messages and implementation of the flood response action plans during flood events in the Skunk Creek watershed.

Sections 2 through 5 include summaries of the hydrologic and hydraulic modeling and results as they relate to the estimation of flood vulnerability of structures and roadway crossings, the determination of flood detection criteria for establishing minimum rainfall and streamflow threshold alarms for sensors in the watershed, and the estimation of hydrologic lead times for the watercourse. The hydrology and hydraulics analyses used for this study were developed as part of the WCMP. Refer to Skunk Creek Watercourse Master Plan, Attachment 3: Hydrology Report, and Attachment 4: Hydraulics and Sediment Report, for complete supporting documentation.

Section 6 of this Technical Memorandum provides information regarding the development of the FRP including the estimation of effective lead times, the selection of the information dissemination option for the Skunk Creek FRP, the flood warning message suite, the emergency response and post-flood action plans for the participating agencies and the residents included in the warning area, and recommendations regarding training, exercises, and FRP updates. Portions of the FRP data and information provided in Section 6 of the Technical Memorandum are also presented in the FRP Field Book.

Flood Response Plan Field Book

The FRP Field Book is provided under separate cover. The material contained herein in Section 6, in part, comprises the information presented in the Field Book. The Field Book contains a description of the components of the flood warning system, flood detection criteria, warning message sequence and content, communication flowchart, effective lead times, agency action plans, resident FRP menus, contact information, and other pertinent emergency information. In addition, digital files for the FRP field book are provided to the District to facilitate future updates to the plan.

The FRP Field Book is intended for use by the District and emergency response agencies to coordinate flood response roles and activities. The FRP Field Book will be distributed to the FCDMC, National Weather Service (NWS) Phoenix Office, Maricopa County Department of Emergency Management (MCDEM), Maricopa County Department of Transportation (MCDOT), Maricopa County Sheriff's Office (MCSO), Daisy Mountain Fire Department (DMFD), and the Rural Metro Fire Department.(RMFD).

Flood Response Plan Menus

The FRP menus include identified potential trouble areas in the flood vulnerable zones, the flood warning messages which trigger each level of emergency response activities, and stepped action plans listing emergency actions required by the affected residents in the warning area. The menus also include aerial photographs showing evacuation routes and destination sites. The menus are intended for use by the individual residents in the Skunk Creek warning area within the floodway and Severe Erosion Hazard Zone.

SECTION 2: FLOOD VULNERABILITY

2.1 Types of Hazards

Two types of flooding hazards are present in the project area. First, a number of homes, both site-built and mobile, are located in the FEMA 100-year floodway and/or the Severe Erosion Hazard Zone and are at risk for inundation during flood events. The District intends for the warning area for the Skunk Creek FRP to include occupied structures in the floodway and/or the Severe Erosion Hazard Zone. Second, Skunk Creek, Cline Creek, and Rodger Creek all cross at least one roadway where overtopping may be hazardous. Skunk Creek crosses many roadways at-grade which are inundated frequently. Both types of hazards were analyzed for the FRP.

2.2 Identification of At-Risk Structures

Initially, structures in the floodway were identified from aerial photographs of the project area taken in July 1999. Using information provided by the Maricopa County Assessor's Office, owners of those parcels were contacted by phone or mail in order to obtain permission to conduct a field survey of their property. The surveyors obtained the finished floor elevation of each residence and the elevation of the ground adjacent to each residence. In addition, field inspection revealed that some of the structures identified in the photos were uninhabited barns, sheds, or other outbuildings. The study focused on occupied structures (houses and mobile homes), although finished floor elevations of some outbuildings were also obtained. This information was used to determine the depth of flooding during the 100-year flood and the threshold flow required to just reach the finished floor elevation.

After the initial evaluation of floodway structures, the study was expanded to include all homes within the Severe Erosion Hazard Zone. These homes were initially identified from

the aerial photographs. A field reconnaissance study verified that the structures were, indeed, occupied residences. Homes within the Severe Erosion Hazard Zone, but outside of the floodway, were not surveyed for finished floor elevations. Instead, the WCMP topographic mapping was used to estimate the elevation of the adjacent ground. For flooding analysis, the estimated ground elevation plus one foot was assumed for the finished floor elevation of these homes.

2.3 Flood Hazard Groups

The at-risk structures were divided into four groups, based on geographical location along the creek. The creation of groups was necessary to customize the flood response action plan menus for the residents of each area. See Figure 2-1 for a map of the group locations. Appendix A contains a listing of homeowners included in the flood warning system. The purpose of creating groups was two-fold. First, because the travel time of peak flow from the rain gages to each group varies, the lead time available to warn residents of flood danger also varies. Clearly, the farther downstream from the gage a structure is located, the more lead time is available. Second, due to overtopping of New River Road and associated secondary roads, not all residents in the project area will be able to go to the same evacuation site. Residents living between the New River Road bridge at Skunk Creek and Rodger Creek will not be able to leave the area due to roadway overtopping.

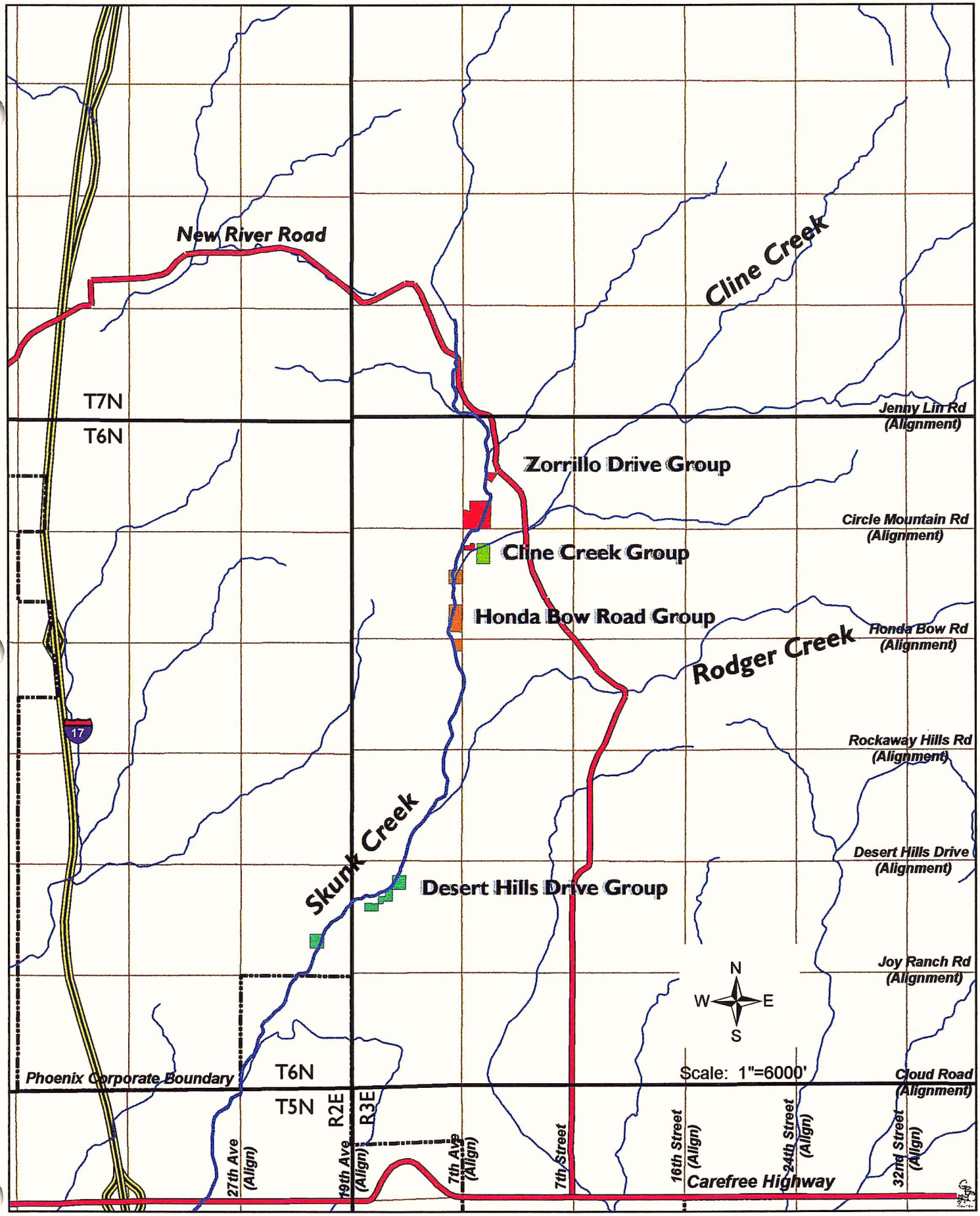


Figure 2-1 Map Of Flood Hazard Group Locations

2.4 Roadway Overtopping

Table 2-1 summarizes the roadway crossings that have been analyzed for this study. The relationship between flow, depth, and velocity at each crossing was determined using HECRAS or HEC-2 hydraulic models, except for the bridge over Cline Creek. As-built drawings were obtained for this bridge that show that it passes the 100-year event without overtopping. Thus, the Cline Creek bridge was assumed to provide 100-year capacity for the purposes of this FRP. The Rodger Creek crossing was analyzed using the effective Flood Insurance Study (FIS) HEC-2 model. The Skunk Creek crossings were modeled using a modified version of the effective FIS HECRAS model. A more detailed discussion of the hydraulic modeling of roadway overtopping is contained in Section 5.4, Hydraulic Analysis.

TABLE 2-1: ROADWAY CROSSING SUMMARY

Watercourse	Roadway	Type
Skunk Creek	New River Road north of the bridge	At-grade
	New River Road at the bridge	Bridge
	Shangri La Lane	At-grade
	Circle Mountain Road	At-grade
	Honda Bow Road	At-grade
	Desert Hills Drive	At-grade
	19th Avenue	At-grade
	Cloud Road/27th Avenue	Culverts
Cline Creek	New River Road	Bridge
Rodger Creek	New River Road	Culverts

The criteria for determining when a flooded roadway becomes too hazardous to cross was adopted from the USBR (1988). Figure 4 in that report is a graph that shows the flood danger level for passenger vehicles as it relates to flow depth and velocity. See Appendix B for Figure 4 and additional excerpts from the report (USBR, 1988). The flood danger levels are shown on the graph as High Danger, Low Danger, and an intermediate Judgment Zone, in which the danger level is based upon engineering judgment. For the FRP, the lower boundary of the Judgment Zone was used to define the point at which a flooded roadway becomes too hazardous to cross.

SECTION 3: FLOOD DETECTION

3.1 Existing Flood Detection System

The primary use of the existing rain and stream gages in the Skunk Creek watershed has been to provide data for the safe operation of Adobe Dam, located downstream, and to provide advisory information in support of road closure decisions during flood events. Additionally, the data are incorporated into the rainfall and streamflow databases maintained by the District. The existing flood detection system used in Maricopa County includes the following major features:

- *ALERT System and MSP* – The District operates and maintains the ALERT (Automated Local Evaluation in Real Time) system comprising, in part, the flood detection network (FDN) for Maricopa County. The FDN contributes to the early detection of flooding by measuring rainfall and streamflow using gage sensors at critical locations in the basins. Rainfall depth and rate alarms and/or streamflow stage and discharge thresholds are preset to notify District personnel when a flood threat is detected. These data are used by the District Meteorological Services Program (MSP) to forecast and monitor significant rainfall events, and to issue weather information and flood warning messages to agencies participating in the program via broadcast fax.

  The District's current ALERT system gages in the Skunk Creek watershed include:

  - ALERT 1 mm Tipping Bucket Rain Gages
    - Upper Skunk Creek (#5580) – installed 08/01/81
    - Skunk Creek at I-17 (#5565) – installed 11/08/89
  - Real-time Streamflow Gages
    - Skunk Creek near New River (#5583) – installed 06/21/95
    - Skunk Creek at I-17 (#5568) – jointly operated with the USGS, installed by USGS 10/01/67, by FCDMC 10/26/89

- *Weather Station Network* – The District utilizes data from a weather station network comprised of 23 stations distributed throughout Maricopa County and vicinity. Those weather data are used to assess the rainfall potential of the air mass covering the County and contributing basins. These weather station data are used in conjunction with other information by the NWS in the issuance of flash flood watches and flash flood warnings. The District also uses this data to issue flood alert messages as part of its Meteorological Services Program (MSP).

- *Radar* – The NWS WSR-88D Doppler radar located at Williams Gateway Airport provides a valuable short-term prediction and detection tool to track thunderstorm systems and other rain-producing cloud systems, measure their intensity, and estimate storm potential. The information obtained from the WSR-88D radar is useful in identifying basins with immediate flash flood threat and in issuing flash flood warnings.

- *Internet Weather and Water Data Sites* – In combination with the preceding sensor networks and radar, other weather and real-time water data are available via the Internet. In effect, the availability of these data expands the temporal and spatial extent of the FDN for use by the FCDMC and the MSP in detecting and monitoring rainfall-producing storms. An exhaustive listing of weather sites available on the Internet is not provided here; however, the following list contains the addresses of key web sites:
  - http://www.fcd.maricopa.gov/alert/alert.htm FCDMC real-time ALERT data
  - http://www.nws.noaa.gov/data.html NWS information about current weather conditions, forecasts, and flash flood watches/ warnings
  - http://water.usgs.gov/data.html Streamflow data from USGS gages
  - http://www.afws.org/ The web site of the Arizona Flood Warning System, owned by the Arizona Department of Water Resources (ADWR) and operated by the Salt River Project (SRP), provides 24 hour hydrological and meteorological information and links to other weather- and water-related sites.

3.2 Proposed FDN Enhancements

The effectiveness of the FRP in providing inundation/evacuation warnings to residents within the Skunk Creek floodplain depends upon the ability to monitor conditions upstream in the watershed. Currently, there is one stream gage on Upper Skunk Creek near Fig Springs Road and one rain gage located near Cline Creek. Additional gaging stations are proposed as follows: add a rain sensor to the Upper Skunk Creek stream gage, one rain gage and one stream gage co-located on lower Cline Creek and one rain gage in each of the upper watersheds of Skunk and Cline Creeks. See Figure 3-1 for a map of the proposed gage locations. A co-located rain and stream gage was proposed for Rodger Creek, but was subsequently eliminated from the plan because the property owners declined to allow the District to install the gage on their property.

The gage locations were chosen to provide additional lead time to implement flood response action plans. Once installed, the proposed stations will be added to the existing ALERT system. Calculation of the lead time available for dissemination of flood warning information to agencies and residents was based upon the assumption that the gages are installed as planned.

Additional recommended enhancements to the FDN include the following:

- It is recommended that a real-time hydrologic model be developed for the Upper Skunk Creek basin. Such a model would facilitate estimation of streamflow at key locations along the watercourse using rainfall data inputs obtained in real-time from the ALERT sensors in the basin.

- The effective lead times available for emergency response were computed for the Upper Skunk Creek flood hazard groups (Section 6.2). Those lead times are

minimal, and in some cases negative, implying the need for strong predictive capabilities for flooding in the basin. Incorporation of radar-based rainfall forecasts, currently available from private vendors, would augment the existing FDN predictive capabilities and lengthen the effective lead time available for emergency response. It is recommended that these forecast products be obtained.

- The FDN for the Skunk Creek watershed could also be supplemented by reports of storms, rainfall, and flooding by citizens and the emergency response community in the area. These observations can be valuable in the verification of sensor data and/or in "spotting" potentially hazardous situations missed by the detection network. No formal "spotter" network exists in the Skunk Creek basin, however, the development of one is encouraged.

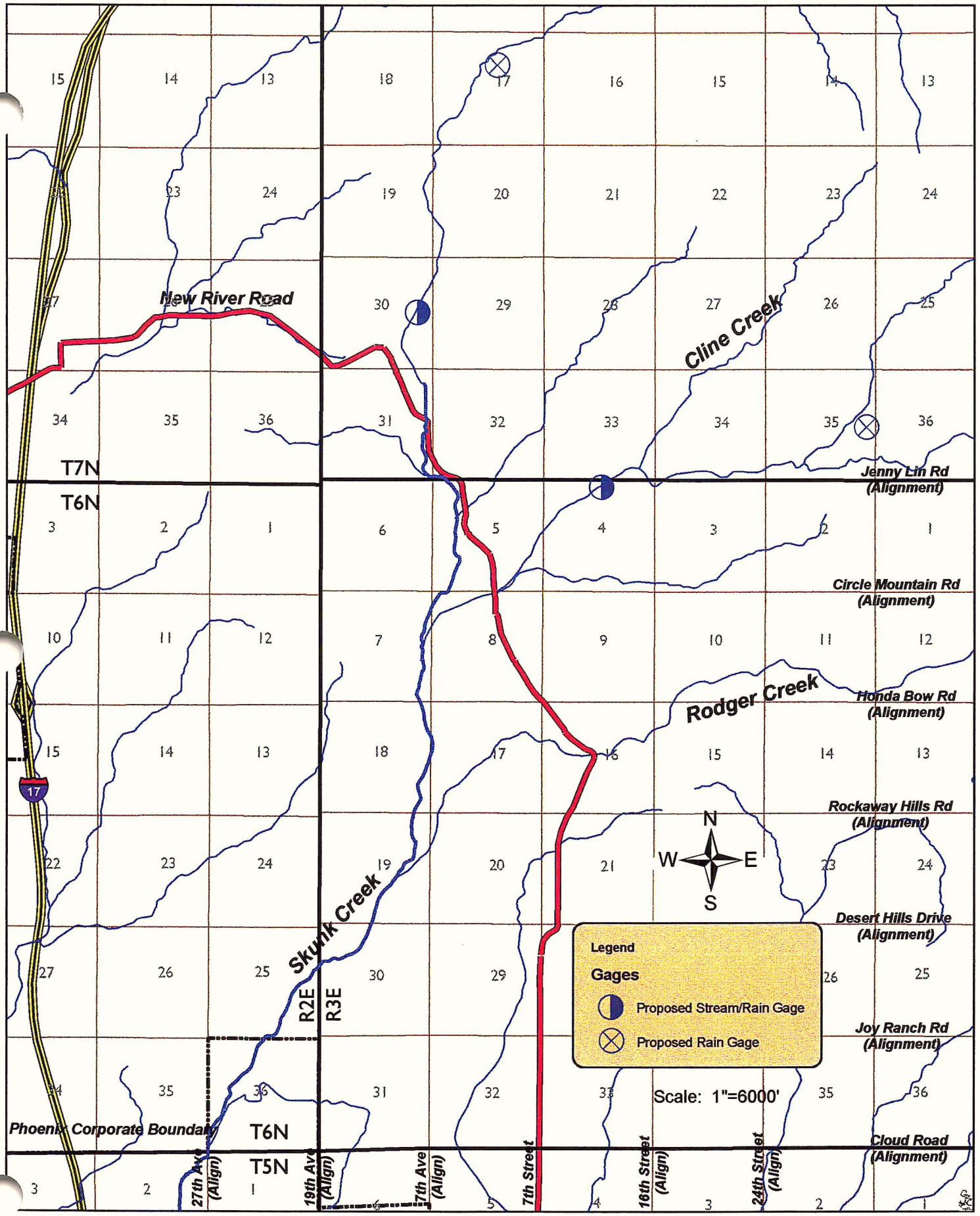


Figure 3-1 Proposed FDN Gage Locations

3.3 Flood Detection Criteria

Flood detection criteria were developed based upon the results of the hydrologic and hydraulic analyses and the assumption that the additional gages are installed as proposed in Section 3.2. The detection criteria are based upon the rainfall intensities required to produce the critical threshold stages or discharges that inundate at-grade crossings at impassable levels and/or reach the finished floor elevations of the floodway structures.

These criteria are recommended for use by the District and NWS to disseminate flood warning messages (Section 6.4) to the residents in the warning area and to appropriate emergency response agencies, thereby triggering implementation of the FRP action plans (Section 6.5). Table 3-1 summarizes detection criteria including rainfall intensities and discharge values for each level of flood alert in the warning message suite.

TABLE 3-1: FLOOD DETECTION CRITERIA

Group	Warning Message	Rainfall Depth (in)	Rainfall Duration (hours)	Rainfall Depth (in)	Rainfall Duration (hours)	Discharge at 5588 (cfs)	Discharge at 5583 (cfs)	Critical Discharge (cfs)
Zorrillo Drive (S13C)	1	1.00	2.5	1.50	5.0	-------	-------	
	2	1.65	2.5	2.25	5.0	1,300		
	3	-------	-------	-------	-------	2,000		4,400
Cline Creek (CCC)	1	1.00	2.5	1.50	5.0	-------	-------	
	2	2.22	2.5	3.30	5.0	-------	4,700	
	3	-------	-------	-------	-------	-------	7,000	10,600
Honda Bow (SC-CC)	1	1.00	2.5	1.50	5.0	-------	-------	
	2	1.48	2.5	1.92	5.0	1,300 or 4,700		
	3	-------	-------	-------	-------	(1,500 and 2,400) or 5,500		8,000
Desert Hills (S16C)	1	1.00	2.5	1.50	5.0	-------	-------	
	2	1.45	2.5	1.87	5.0	1,300 or 4,700		
	3	-------	-------	-------	-------	(1,600 and 3,000) or 6,000		9,000

SECTION 4: HYDROLOGIC ANALYSIS

4.1 General

The base hydrologic data used for the development of the FRP were taken from three existing floodplain delineation studies, as follows:

- Skunk Creek Floodplain Delineation Study, June 1997 by Montgomery Watson Americas, Inc. (Montgomery Watson) for the Flood Control District of Maricopa County, FCD 95-16. This study models the Skunk Creek watershed above the Central Arizona Project (CAP) Canal.

- Rodger Creek Floodplain Delineation Study, December 1989 by Michael Baker, Jr., Inc. for the Flood Control District of Maricopa County, FCD 89-15. Revised by the Flood Control District of Maricopa County in February 1996. This study models the watershed of Rodger Creek above its confluence with Skunk Creek.

- Cline Creek Floodplain Delineation Study, December 1989 by Michael Baker, Jr., Inc. for the Flood Control District of Maricopa County, FCD 89-15. Revised by the Flood Control District of Maricopa County in February 1996. This study models the watershed for Cline Creek above its confluence with Skunk Creek.

The results of all three of these models were combined and used as the base hydrology for the Skunk Creek Watercourse Master Plan. The rainfall-runoff models were run using the U.S. Army Corps of Engineers HEC-1 computer program, version 4.0.1E, September 1990, as implemented by Dodson and Associates. The results of the modeling have been summarized in this report for the

convenience of the user. Please refer to Skunk Creek Watercourse Master Plan, Attachment 3: Hydrology Report for the complete supporting documentation.

4.2 WCMP Hydrology Results

Tables 4-1 and 4-2 summarize the results of the WCMP hydrologic modeling. This modeling used the 24-hour SCS Type II rainfall distribution. HEC-1 results are listed for individual subbasins and concentration points. Refer to the Skunk Creek Watershed Map (digital file provided on the attached CD-ROM), for the locations of subbasins and concentration points.

Table 4-1 shows peak discharge and time to peak. Table 4-2 shows rainfall volume results. These values are for existing conditions in the watershed at the time the FIS studies were completed.

TABLE 4-1: SUMMARY OF SKUNK CREEK PEAK DISCHARGES

HEC-1 ID	Existing Drainage Area [sq. mi.]	Time of Peak			Peak Discharge		
		2-Year [hours]	10-Year [hours]	100-Year [hours]	2-Year [cfs]	10-Year [cfs]	100-Year [cfs]
Subbasin Operations							
S1	2.08	12.17	12.17	12.17	673	1,610	2,911
S2	1.17	12.17	12.17	12.17	472	1,000	1,738
S3	1.03	12.17	12.17	12.17	293	764	1,415
S4	0.97	12.17	12.17	12.17	242	686	1,295
S5	1.85	12.33	12.25	12.25	359	1,043	2,007
S6	0.94	12.25	12.17	12.17	319	744	1,339
S9	1.02	12.25	12.17	12.17	232	658	1,254
S10	1.80	12.25	12.25	12.17	438	1,236	2,350
S7	0.68	12.17	12.17	12.17	306	623	1,061
S8	1.12	12.17	12.17	12.17	323	885	1,650
S13	1.27	12.17	12.17	12.17	388	956	1,734
S11	0.92	12.25	12.17	12.17	214	611	1,161
S12	0.91	12.25	12.25	12.25	368	760	1,307
S14	0.83	12.08	12.08	12.08	340	762	1,336
X1SUB	0.61	12.00	12.00	12.00	406	748	1,216
X2SUB	0.43	12.08	12.00	12.00	256	496	824

TABLE 4.1: SUMMARY OF SKUNK CREEK PEAK DISCHARGES, cont'd

HEC-1 ID	Existing Drainage Area [sq. mi.]	Time of Peak			Peak Discharge		
		2-Year [hours]	10-Year [hours]	100-Year [hours]	2-Year [cfs]	10-Year [cfs]	100-Year [cfs]
X3SUB	0.56	12.08	12.08	12.08	321	632	1,054
X4SUB	0.28	12.00	12.00	12.00	214	382	613
X5SUB	0.38	12.08	12.00	12.00	186	419	727
SUBC1	1.26	12.00	12.00	12.00	484	1,291	2,369
SUBC2	2.19	12.17	12.08	12.08	514	1,575	3,033
SUBC3	1.24	12.08	12.08	12.08	356	1,055	1,990
SUBC4	2.54	12.08	12.08	12.08	696	2,090	3,948
SUBC5	3.39	12.08	12.08	12.08	1,034	2,919	5,426
SUBC7	1.20	12.08	12.00	12.00	734	1,407	2,311
SUBC8	1.42	12.08	12.08	12.08	862	1,583	2,543
SUBC9	0.58	12.17	12.17	12.17	210	510	915
S15	0.99	12.17	12.17	12.17	426	903	1,564
R1	1.56	12.17	12.17	12.17	911	1,638	2,636
R2	1.98	12.17	12.17	12.17	1,003	1,892	3,120
R3	1.59	12.25	12.25	12.25	609	1,208	2,074
S16	1.32	12.17	12.08	12.08	309	1,000	1,930
S21	2.22	12.33	12.25	12.25	868	1,746	2,946
S17	1.03	12.25	12.25	12.25	378	813	1,422
S18	1.71	12.25	12.25	12.25	789	1,529	2,537
S19	0.77	12.08	12.08	12.08	429	827	1,368
S20	1.27	12.25	12.25	12.25	600	1,150	1,900
S22	1.47	12.17	12.17	12.17	348	1,044	1,987
S23	1.72	12.42	12.42	12.42	556	1,184	2,027
S24	0.64	12.08	12.08	12.08	281	642	1,113
Concentration Points							
S2C	3.25	12.42	12.33	12.33	836	2,035	3,760
S3C	4.28	12.25	12.25	12.25	1,036	2,633	4,899
S5C	2.82	12.25	12.25	12.25	564	1,653	3,169
S6C	8.04	12.67	12.58	12.58	1,463	4,063	7,840
S8C	1.80	12.17	12.17	12.17	616	1,491	2,685
S10C	12.66	12.50	12.50	12.50	1,674	4,919	9,741
S12C	1.83	12.33	12.33	12.33	499	1,230	2,246
S13C	15.76	12.50	12.50	12.50	2,070	6,010	11,811
S14RC	16.59	12.67	12.58	12.67	2,083	6,044	11,863
XCO-1	1.04	12.08	12.08	12.08	617	1,174	1,933
XCO-2	1.60	12.17	12.17	12.17	741	1,486	2,500
XCO-3	1.88	12.08	12.08	12.08	856	1,718	2,890
XCO-4	2.26	12.08	12.08	12.08	1,031	2,109	3,571
CCO-1	5.93	12.17	12.08	12.08	1,185	3,921	7,632
CCO-2	10.62	12.42	12.25	12.25	1,460	5,405	10,883
CCO-3	2.62	12.17	12.17	12.17	894	1,684	2,818

TABLE 4.1: SUMMARY OF SKUNK CREEK PEAK DISCHARGES, cont'd

HEC-1 ID	Existing Drainage Area [sq. mi.]	Time of Peak			Peak Discharge		
		2-Year [hours]	10-Year [hours]	100-Year [hours]	2-Year [cfs]	10-Year [cfs]	100-Year [cfs]
CCO-4	15.50	12.42	12.50	12.50	2,144	7,055	13,884
CCO-5	16.08	12.58	12.67	12.67	2,149	6,975	13,747
S14C	32.67	12.67	12.67	12.67	3,845	12,307	24,427
CO-1	3.54	12.25	12.25	12.25	1,519	2,901	4,800
CO-2	5.13	12.58	12.58	12.58	1,699	3,308	5,624
S16C	40.11	12.83	12.92	12.92	4,868	14,001	27,332
S21C	42.33	13.25	13.33	13.33	4,728	13,642	26,688
S18C	2.74	12.33	12.33	12.33	943	1,947	3,343
S19C	3.51	12.25	12.25	12.25	1,222	2,478	4,239
S20C	4.78	12.42	12.42	12.42	1,500	3,070	5,257
S21C2	47.11	13.25	13.33	13.33	4,948	14,049	27,733
S22C	48.58	13.50	13.58	13.58	4,872	13,837	27,283
S23L	50.29	14.08	14.17	14.17	4,712	13,417	26,513
C010	50.29	13.33	13.00	12.83	2,098	4,852	9,825
CAP	63.68	13.50	14.00	14.08	5,413	14,606	28,467
S24C	64.32	13.75	14.17	14.33	5,314	14,436	28,227

TABLE 4-2: SUMMARY OF SKUNK CREEK RUNOFF VOLUMES

HEC-1 ID	Existing Drainage Area [sq. mi.]	Rainfall Excess			Runoff Volume		
		2-Year [in]	10-Year [in]	100-Year [in]	2-Year [ac-ft]	10-Year [ac-ft]	100-Year [ac-ft]
Subbasin Operations							
S1	2.08	0.391	0.925	1.816	43.4	102.6	201.5
S2	1.17	0.490	1.053	1.998	30.6	65.7	124.7
S3	1.03	0.319	0.843	1.669	17.5	46.3	91.7
S4	0.97	0.242	0.749	1.544	12.5	38.7	79.9
S5	1.85	0.237	0.746	1.543	23.4	73.6	152.2
S6	0.94	0.375	0.898	1.793	18.8	45.0	89.9
S9	1.02	0.241	0.748	1.543	13.1	40.7	83.9
S10	1.80	0.243	0.744	1.533	23.3	71.4	147.2
S7	0.68	0.501	1.076	2.043	18.2	39.0	74.1
S8	1.12	0.252	0.752	1.545	15.1	44.9	92.3
S13	1.27	0.535	1.163	2.085	36.2	78.8	141.2
S11	0.92	0.241	0.748	1.542	11.8	36.7	75.7
S12	0.91	0.457	1.013	1.959	22.2	49.2	95.1
S14	0.83	0.656	1.317	2.320	29.0	58.3	102.7
X1SUB	0.61	0.697	1.364	2.447	22.7	44.4	79.6
X2SUB	0.43	0.540	1.143	2.151	12.4	26.2	49.3
X3SUB	0.56	0.461	1.030	1.995	13.8	30.8	59.6
X4SUB	0.28	0.545	1.192	2.282	8.1	17.8	34.1
X5SUB	0.38	0.333	0.831	1.695	6.7	16.8	34.4
SUBC1	1.26	0.202	0.705	1.451	13.6	47.4	97.5
SUBC2	2.19	0.194	0.694	1.431	22.7	81.1	167.1
SUBC3	1.24	0.203	0.716	1.469	13.4	47.4	97.1
SUBC4	2.54	0.192	0.691	1.426	26.0	93.6	193.2
SUBC5	3.39	0.281	0.820	1.610	50.8	148.3	291.1
SUBC7	1.20	0.686	1.384	2.506	43.9	88.6	160.4
SUBC8	1.42	0.718	1.469	2.682	54.4	111.3	203.1
SUBC9	0.58	0.392	0.957	1.882	12.1	29.6	58.2
S15	0.99	0.582	1.180	2.164	30.7	62.3	114.3
R1	1.56	0.775	1.489	2.647	64.5	123.9	220.2
R2	1.98	0.675	1.331	2.397	71.3	140.6	253.1
R3	1.59	0.741	1.385	2.419	62.8	117.4	205.1
S16	1.32	0.180	0.699	1.468	12.7	49.2	103.3
S21	2.22	0.490	1.099	2.120	58.0	130.1	251.0
S17	1.03	0.419	0.954	1.871	23.0	52.4	102.8
S18	1.71	0.512	1.126	2.159	46.7	102.7	196.9
S19	0.77	0.541	1.153	2.174	22.2	47.3	89.3
S20	1.27	0.593	1.239	2.310	40.2	83.9	156.5

TABLE 4.2: SUMMARY OF SKUNK CREEK RUNOFF VOLUMES, cont'd

HEC-1 ID	Existing Drainage Area [sq. mi.]	Rainfall Excess			Runoff Volume		
		2-Year [in]	10-Year [in]	100-Year [in]	2-Year [ac-ft]	10-Year [ac-ft]	100-Year [ac-ft]
S22	1.47	0.210	0.723	1.503	16.5	56.7	117.8
S23	1.72	0.473	1.109	2.170	43.4	101.7	199.1
S24	0.64	0.367	0.920	1.863	12.5	31.4	63.6
Concentration Points							
S2C	3.25	0.416	0.956	1.853	72.1	165.7	321.2
S3C	4.28	0.384	0.918	1.787	87.7	209.5	407.9
S5C	2.82	0.229	0.735	1.520	34.4	110.5	228.6
S6C	8.04	0.304	0.812	1.621	130.4	348.2	695.1
S8C	1.80	0.338	0.863	1.711	32.4	82.8	164.3
S10C	12.66	0.265	0.758	1.528	178.9	511.8	1,031.7
S12C	1.83	0.340	0.867	1.724	33.2	84.6	168.3
S13C	15.76	0.276	0.772	1.540	232.0	648.9	1,294.4
S14RC	16.59	0.289	0.790	1.562	255.7	699.0	1,382.1
XCO-1	1.04	0.631	1.271	2.321	35.0	70.5	128.7
XCO-2	1.60	0.565	1.174	2.186	48.2	100.2	186.5
XCO-3	1.88	0.558	1.171	2.188	55.9	117.4	219.4
XCO-4	2.26	0.515	1.106	2.092	62.1	133.3	252.2
CCO-1	5.93	0.230	0.745	1.494	72.7	235.6	472.5
CCO-2	10.62	0.189	0.679	1.387	107.0	384.6	785.6
CCO-3	2.62	0.690	1.409	2.564	96.4	196.9	358.3
CCO-4	15.50	0.292	0.813	1.599	241.4	672.1	1,321.8
CCO-5	16.08	0.292	0.812	1.598	250.4	696.4	1,370.4
S14C	32.67	0.267	0.764	1.514	465.2	1,331.2	2,638.0
CO-1	3.54	0.707	1.381	2.472	133.5	260.7	466.7
CO-2	5.13	0.705	1.363	2.424	192.9	372.9	663.2
S16C	40.11	0.300	0.800	1.560	641.8	1,711.4	3,337.1
S21C	42.33	0.303	0.803	1.566	684.1	1,812.9	3,535.4
S18C	2.74	0.467	1.045	2.021	68.2	152.7	295.3
S19C	3.51	0.476	1.057	2.033	89.1	197.9	380.6
S20C	4.78	0.499	1.090	2.079	127.2	277.9	530.0
S21C2	47.11	0.310	0.808	1.575	778.9	2,030.1	3,957.2
S22C	48.58	0.304	0.801	1.564	787.6	2,075.3	4,052.2
S23L	50.29	0.304	0.801	1.565	815.4	2,148.4	4,197.5
C010	50.29	0.110	0.239	0.457	295.0	641.0	1,225.7
CAP	63.68	0.320	0.806	1.573	1,086.8	2,737.4	5,342.3
S24C	64.32	0.320	0.805	1.572	1,097.7	2,761.5	5,392.6

4.3 Rainfall Distribution

The hydrologic modeling completed for the WCMP used the 24-hour, SCS Type II distribution. For the FRP study, the HEC-1 models were run using various rainfall distributions in order to compare the effect each distribution had on basin response time, travel time, and the relationship between rainfall depth and the resulting peak discharge through the flood hazard areas.

The following rainfall distributions were used during the FRP hydrologic analysis:

- 24-hour SCS Type II distribution
- 6-hour Maricopa County distribution (from Drainage Design Manual for Maricopa County: Hydrology, 1992)
- Hypothetical distribution
- 4 historical rainfall distributions from FCDMC database (Dates: July 7, 1990; August 14, 1990; February 28, 1991; August 31, 1993)

The effect that using various rainfall distributions had on basin response time and the selection of rainfall trigger levels for the ALERT system is discussed in subsequent sections. Plots of each distribution are included in Appendix C-1.

4.4 Basin Response Time

Basin response time is defined for purposes of the FRP study as the lag time between the time of peak rainfall intensity and the time of peak discharge at the concentration point(s) nearest to the ALERT gage location(s). The calculated basin response time varied according to gage location and the rainfall distribution being used. Table 4-3 shows a comparison of the basin response time calculations. Appendix C-1 contains plots of each rainfall distribution and the resulting

hydrograph at each gage station. Based on these results, a basin response time of 20 minutes was selected for calculation of the hydrologic lead time for implementation of the action plan.

TABLE 4-3: COMPARISON OF BASIN RESPONSE TIME RESULTS

	BASIN RESPONSE TIME [min]	
RAINFALL DISTRIBUTION	**SKUNK CREEK GAGE (CP* S3C)**	**CLINE CREEK GAGE (CP CC0-2)**
24-hour SCS Type II	20	20
6-hour Maricopa County	25	25
Hypothetical	35	35
Historical 7-7-90	20	20
Historical 8-14-90	20	20
Historical 2-28-91	20	20
Historical 8-31-93	20	20

*CP = HEC-1 concentration point

4.5 Travel Time

Travel time is defined for purposes of the FRP study as the time period between peak discharge at the ALERT gage site and peak discharge at the downstream flood hazard area. The total hydrologic lead time is the sum of the basin response time and the subsequent travel time. Travel time to each flood hazard area was calculated using the results of hydraulic modeling.

Average travel time is a HECRAS output variable that is calculated by dividing the reach length by the flow velocity. Travel time from the Skunk Creek gage was

taken directly from the hydraulic model output. Travel time from the Cline Creek gage to Skunk Creek had to be calculated from the HEC-2 model flow velocities, because it is not a HEC-2 output variable.

Table 4-4 shows the travel times used in calculating the total hydrologic lead time for the FRP. The table also shows which watercourses contribute to the total flow through each flood hazard area.

TABLE 4-4: SUMMARY OF TRAVEL TIME CALCULATIONS

FLOOD HAZARD GROUP	FROM GAGE SITE	TRAVEL TIME [min]
Zorrillo Drive	Skunk	23
Cline Creek	Cline	17
Honda Bow Road	Skunk	37
	Cline	22
Desert Hills Drive	Skunk	57
	Cline	44

4.6 Threshold Alarm Levels

The threshold rainfall intensities and streamflow discharges that will trigger each level of alert in the FRP were selected by the District. These threshold values are based upon the results of hydrologic models of the Skunk Creek basin using rainfall distributions derived from historical data for two storm events of 2.5- and 5-hour duration. Threshold precipitation depth plots are shown in Appendix C-2. The resulting flood detection criteria are provided in Table 3-1.

4.7 Storm Recurrence Interval Estimation

In order to estimate the probability of flooding for each structure, storm recurrence interval curves were plotted from HEC-1 modeling results. The curves are shown in Appendix C-3. Each flood hazard area has a separate curve, plotted from data for the nearest concentration point. Peak flows during the 2-year, 10-year, and 100-year storms were plotted on 2-cycle log normal graph paper (Figure 9-4 in the ADOT Highway Drainage Design Manual, Hydrology) and a smooth curve was drawn through the points.

The curves were used to estimate the return interval of the storm that would cause flooding to reach the finished floor elevation of each structure (or the ground adjacent to mobile homes). The probability of flooding for each structure is included in the hydraulic modeling results, shown in Tables 5-1 through 5-4.

SECTION 5: HYDRAULIC ANALYSIS

5.1 General

The base hydraulic data used for this study was developed as part of the WCMP. Refer to Skunk Creek Watercourse Master Plan, Attachment 4: Hydraulics and Sediment Report, for the complete supporting documentation. The effective FIS model for Skunk Creek is a HEC-2 model prepared by Montgomery Watson for the Skunk Creek Floodplain Delineation Study, June 1997. This model was converted to HECRAS format and used as the base WCMP model.

The effective FIS models for Cline Creek and Rodger Creek were also used in this study. Those HEC-2 models were prepared in December 1989 by Michael Baker, Jr., Inc. and revised by the Flood Control District of Maricopa County in February 1996.

HEC-2 models were run using the U.S. Army Corps of Engineers HEC-2 computer program, as implemented by Dodson & Associates, Inc. in their ProHEC2 Plus software, Version 4.6.2PD, July 1995. HECRAS models were run using the U.S. Army Corps of Engineers HECRAS (River Analysis System) program, Version 3.0.1, March 2001. Refer to the FRP work map (digital file provided on the attached CD-ROM), which shows the location of cross-sections used in hydraulic modeling.

5.2 Analysis of Flood Hazards for Floodway Structures

The base WCMP 100-year storm model was modified to include a cross-section for each home in the floodway. This was done in order to obtain, as accurately as possible, the 100-year water surface elevation at each structure. Model results were used in conjunction with the surveyed finished floor elevations to determine the depth of flooding at each structure.

The flow required to just reach the finished floor elevation of each structure was also determined using the HECRAS model. This information was used to estimate the probability of flooding for each structure. The storm recurrence interval curves discussed in Section 4.7 were used to estimate the return interval of the storm that would cause flooding to reach the finished floor elevation.

For mobile homes, the probability of flooding was calculated using the adjacent ground elevation in lieu of the finished floor elevation. Most of the mobile homes are not flooded, because they are set up on foundation piers that raise the finished floor a few feet above the adjacent ground. However, floodwaters flowing underneath a mobile home will likely erode the soil under the foundation piers and cause the structure to fall into the water. For this reason, the adjacent ground elevation was used for mobile home flood hazard calculations.

The threshold inundation frequency data is summarized in Section 5.6.

5.3 Analysis of Flood Hazards for Residences Not Surveyed

Most of the homes that are located in the Severe Erosion Hazard Zone, but outside of the floodway, were not surveyed for finished floor and adjacent ground elevations. Elevations for these structures were taken from the WCMP topographic mapping. For calculating the probability of flooding, it was assumed that finished floor elevations were one foot above the estimated ground elevation. The flow required to reach this elevation was determined using the HECRAS model. Cross-sections were not added to the model for these structures; instead, the water surface elevation was interpolated between the two cross-sections bordering the structure. The storm recurrence interval curves discussed in Section 4.7 were used to estimate the return interval of the storm that would cause flooding to reach the assumed finished floor elevation.

For mobile homes in the floodplain, the probability of flooding was calculated in the same manner as it was for mobile homes in the floodway. The estimated ground elevation was used for mobile home flood hazard calculations.

5.4 Roadway Overtopping

The roadway crossings listed in Table 2-1 were analyzed for overtopping during the 100-year event. The WCMP HECRAS model was used to determine the relationship between discharge, flow depth, and flow velocity at each Skunk Creek crossing. The roadway elevations were estimated from WCMP topographic mapping. The New River Road bridge at Skunk Creek was already included in the WCMP model. For the 19th Avenue and Desert Hills Drive crossings, cross-sections were added to the model. The Cloud Road/ 27th Avenue culverts were assumed to be full and roadway overtopping was calculated using cross-sections 17.95 through 18.29. Overtopping of the remaining Skunk Creek dip crossings was estimated using adjacent cross-sections.

Approximately 900 feet north of the New River Road bridge, breakout flow from Skunk Creek overtops the roadway when flow in the channel exceeds approximately 3,000 cfs. The flow that breaks out of Skunk Creek and overtops the road at that location was estimated using the HECRAS split flow routine. To model this crossing, the roadway elevation of New River Road from the Skunk Creek bridge north to the floodplain boundary was surveyed at 50-foot intervals. The discharge/ flow depth/ velocity relationship at a dip in that section of road was calculated using Manning's equation and the roadway profile.

As-built drawings were obtained for the New River Road bridge over Cline Creek. These plans show that the bridge passes the 100-year event without overtopping. The Cline Creek bridge was assumed to have 100-year capacity for the purposes of this FRP. Rodger Creek

crosses New River Road through two 8-foot diameter culverts. This crossing is modeled in the effective FIS HEC-2 model, which was used to analyze overtopping at that location.

Appendix D-2 contains a plot for each crossing showing the flow depth versus flow velocity. These plots were used to determine the threshold flow, velocity, and depth for each crossing. The threshold values represent the point where the depth/ velocity curve intersects the lower boundary of the Judgment Zone. Table 5-5 shows the threshold values for each crossing.

5.5 Split Flows

Two split flow analyses were prepared as part of the FRP study; one each at the New River Road bridge crossing and in the area of Desert Hills Drive. HECRAS, version 3.0.1, was used to conduct the split flow analyses. Since no structures were determined to be located in the floodway or Severe Erosion Hazard Zone in the vicinity of the New River Road bridge, this area was not included in the FRP. The split flow near Desert Hills Drive potentially impacted residential structures; therefore, this area was further investigated.

Figure 5-1 shows the area where the flow split affects homes located on the left overbank, downstream of Desert Hills Drive. A small secondary channel on the left overbank begins near cross-section 21.41 and continues downstream, ultimately leading into a section of braided channel near cross-section 20.16. In order to estimate the probability of flooding for homes along the secondary channel, a split flow analysis was performed. Floodwaters reach the homes in this area via the secondary channel well before flow in the main channel reaches an elevation high enough to overtop the left channel bank. For the purposes of this study, the ridge of high ground on the left overbank between cross-sections 20.79 and 21.41 was modeled as a broad-crested lateral weir with a coefficient of 2.6.

A rating curve, shown in Figure 5-2, was developed to show the relationship between breakout flow and the total flow in the channel. The secondary channel is small enough and close enough to the main channel that flow submerges the "weir" and becomes one unbroken flow during storms much less severe than the 100-year event. For this reason, the rating curve was only used for total flows of 15,500 cfs or less. The storm recurrence interval associated with flows higher than 15,500 cfs was estimated using results from the WCMP HECRAS model without the split flow option.

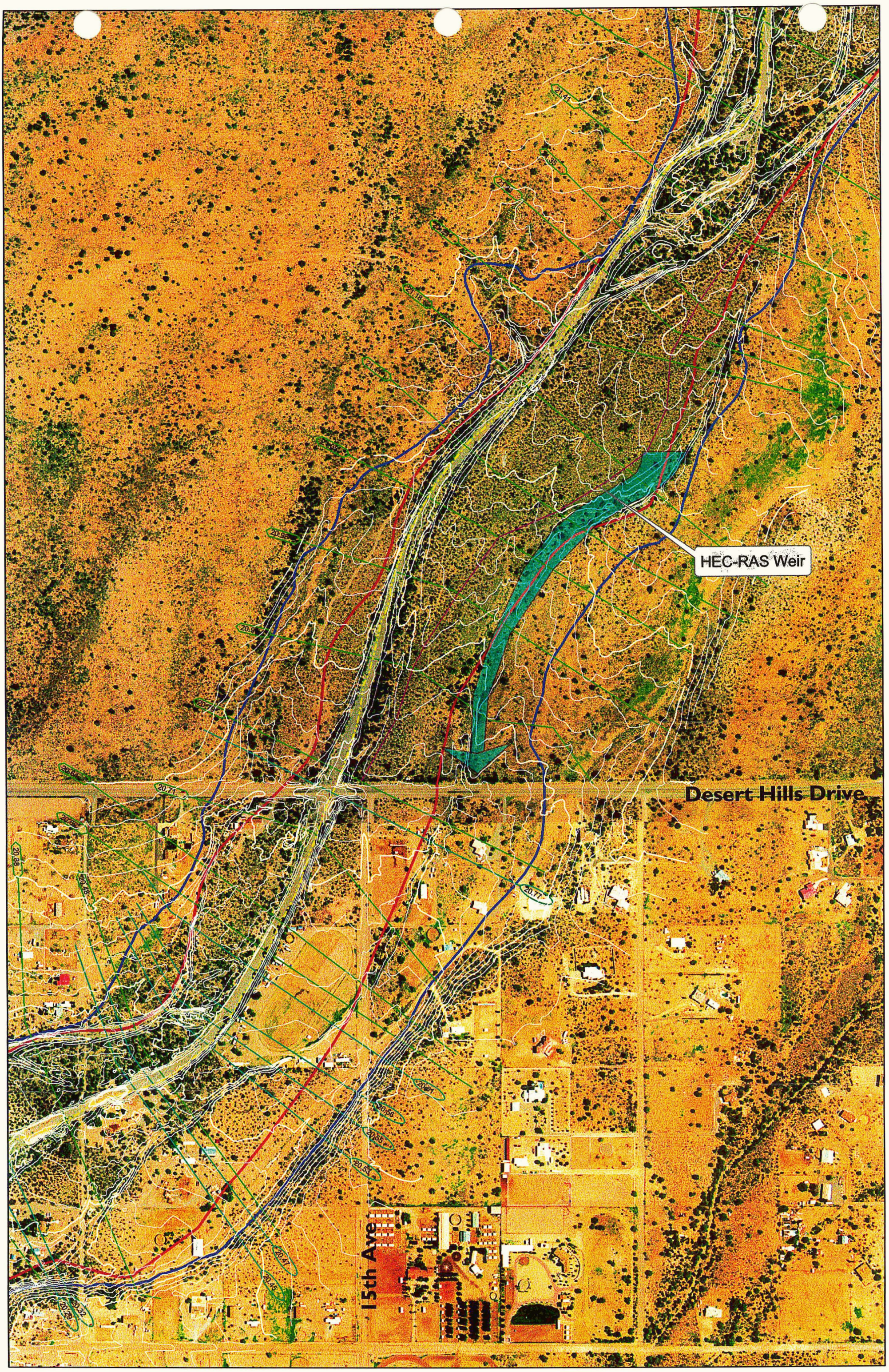
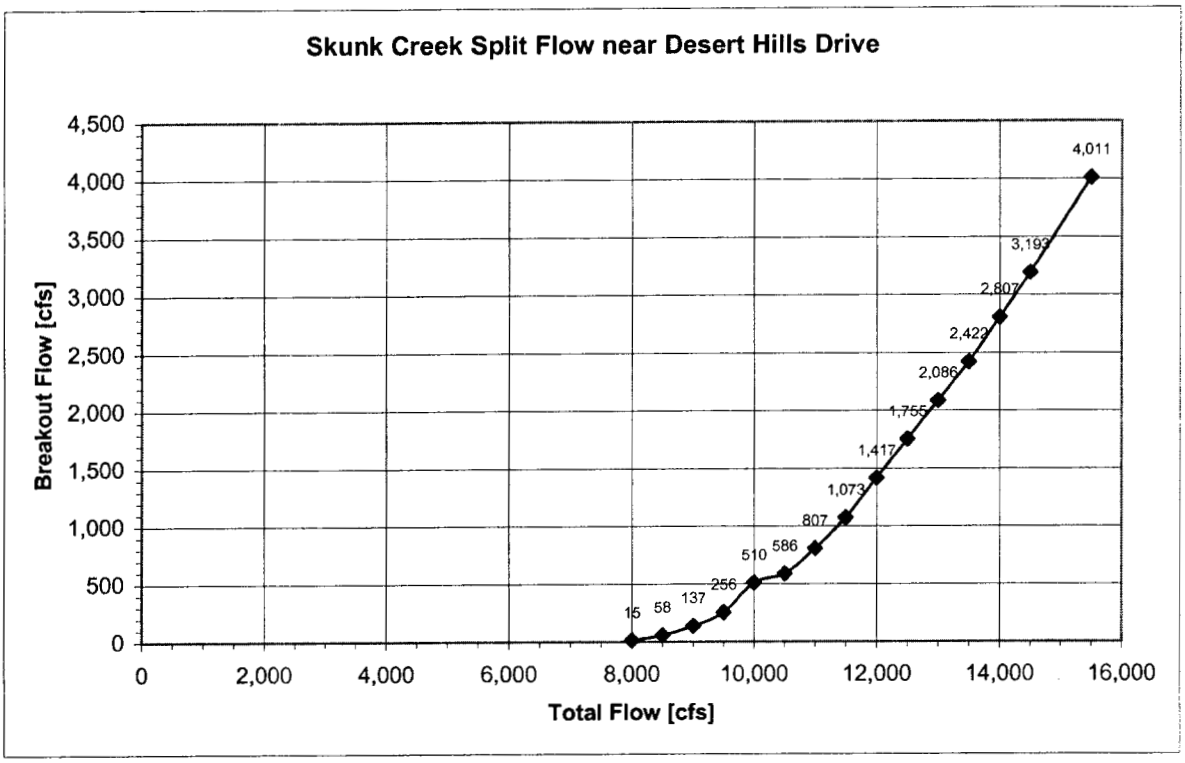


Figure 5-1
Desert Hills Drive Split Flow Area

FIGURE 5-2: RATING CURVE FOR DESERT HILLS DRIVE FLOW SPLIT



5.6 Modeling Results

Summaries of the hydraulic modeling results for homes in the floodway and Severe Erosion Hazard Zone are shown in Tables 5-1 through 5-4. The tables are presented by flood hazard groups described in Section 2.3. Supporting data is included in Appendix D-1. Roadway overtopping results are shown in Table 5-5, with supporting data in Appendix D-2.

TABLE 5-1: PROBABILITY OF FLOODING FOR ZORRILLO DRIVE GROUP

Parcel #	Tag ID	Name	Structure	HECRAS Q_{100} [cfs]	Q_{FFE} (or Q_{ground}, mobiles) [cfs]	Return Frequency to FFE/EGE	FW	FP
202-21-008T	579	Kraus Investmnt	Mobile	11,800	4,400	6-yr		X
202-21-008T	579	Kraus Investmnt	Mobile	11,800	5,000	8-yr		X
202-21-150	826	Parry	Mobile	9,700	5,000	13-yr		X
202-21-031Q	639	Sartain	House 1	11,800	>11,800	>100-yr	X	

*FFE = finished floor elevation (houses), EGE = estimated ground elevation (mobile homes)

TABLE 5-2: PROBABILITY OF FLOODING FOR CLINE CREEK GROUP

Parcel #	Tag ID	Name	Structure	HECRAS Q_{100} [cfs]	Q_{FFE} (or Q_{ground}, mobiles) [cfs]	Return Frequency to FFE/EGE	FW	FP
202-21-031C	634	Selleys	House	16,700	10,600	40-yr	X	
202-21-032A	647	Caldwell	House	16,700	13,300	91-yr	X	

TABLE 5-3: PROBABILITY OF FLOODING FOR HONDA BOW ROAD GROUP

Parcel #	Tag ID	Name	Structure	HECRAS Q_{100} [cfs]	Q_{FFE} (or Q_{ground}, mobiles) [cfs]	Return Frequency to FFE/EGE	FW	FP
211-22-002B	5	McKeag	House	24,400	8,000	5-yr	X	
202-21-169	847	Hines	House	24,400	8,000	5-yr	X	
202-21-024B	616	Albert	House	24,400	12,200	13-yr	X	
211-22-002J	6	Geraci	Mobile	24,400	13,500	16-yr	X	
202-21-013R	585	Eller	House	24,400	18,000	34-yr	X	
202-21-013M	584	Funk	House	24,400	19,000	42-yr		X

TABLE 5-4: PROBABILITY OF FLOODING FOR DESERT HILLS DRIVE GROUP

Parcel #	Tag ID	Name	Structure	HECRAS Q_{100} [cfs]	Q_{FFE} (or Q_{ground}, mobiles) [cfs]	Return Frequency to FFE/EGE	FW	FP
211-50-022	62	Hopwood Trust	Mobile 3	27,300	9,000	5-yr	X	
211-50-022	62	Hopwood Trust	Mobile 2	27,300	11,700	8-yr	X	
211-50-016J	84	Harper	Mobile 1	27,300	13,000	11-yr	X	
211-50-037C	104	Mathis	Mobile	27,300	13,600	12-yr	X	
211-50-016J	84	Harper	Mobile 3	27,300	13,500	12-yr	X	
211-50-016J	84	Harper	Mobile 2	27,300	14,250	13-yr	X	
211-50-022	62	Hopwood Trust	Mobile 1	27,300	15,000	15-yr	X	
211-50-037C	104	Mathis	House	27,300	19,600	31-yr	X	
211-50-016H	929	Birdsell	Mobile	27,300	25,000	71-yr	X	
211-50-022	62	Hopwood Trust	House 2	27,300	25,000	71-yr		X
211-50-022	62	Hopwood Trust	House 1	27,300	27,300	100-yr	X	
203-32-006	148	Parks*	Mobile	27,300	n/a	n/a		

*The Parks residence is located in the Severe Erosion Hazard Zone, but outside of the 100-year floodplain.

TABLE 5-5: ROADWAY CROSSING MODELING RESULTS

Watercourse	Roadway	Type	Threshold Depth [ft]	Threshold Flow [cfs]	Threshold Velocity [ft/s]
Skunk Creek	New River Road north of the bridge	At-grade	1.7	5,800	3.8
	New River Road at the bridge	Bridge	N/A	N/A	N/A
	Shangri La Lane	At-grade	1.7	250	3.0
	Circle Mountain Road	At-grade	1.7	350	4.0
	Honda Bow Road	At-grade	1.9	200	3.8
	Desert Hills Drive	At-grade	1.6	400	4.2
	19th Avenue	At-grade	1.7	1,250	3.3
	Cloud Road/27th Ave	Culvert	1.8	16,000	2.0
Cline Creek	New River Road	Bridge	N/A	N/A	N/A
Rodger Creek	New River Road	Culvert	1.8	2,500	1.6

N/A = Bridge is not overtopped during the 100-year event

SECTION 6: FLOOD RESPONSE PLAN

6.1 General Background

The District has maintained and operated a rain gage and a stream gage in the Phase 2 study reach of upper Skunk Creek since 1981 and 1995, respectively. Those gage data, in combination with rainfall and streamflow data from gages located downstream at the I-17 crossing at Skunk Creek, are used by the District to support the following functions:

- Flood Warning - The primary flood warning use of the Skunk Creek gages has been to provide data for evaluation of the performance and safety of Adobe Dam located downstream. Additionally, the collected data provide advisory information in support of road closure decisions during flood events.

- Data Collection/ Archive - The data continue to be incorporated into rainfall and streamflow databases maintained by the District. These databases provide critical data for the design and evaluation of engineered structures in the Skunk Creek watershed as well as elsewhere around Maricopa County and the State of Arizona.

District staff report that the existing flood warning system has been adequate thus far to meet the flood warning needs in the Skunk Creek watershed as described above. However, since June 1995 when the "Skunk Creek near New River" stream gage was installed, no extreme flood events have occurred. In consideration of the potential impacts of larger floods to structures and roadway crossings in the Phase 2 study area, an assessment of the need for flood warning for this area was justified.

6.1.1 Flood Warning System (FWS) Needs Assessment

The necessary elements and objectives of the Skunk Creek FWS were assessed by:

- Considering the information provided by the District's existing Automated Local Evaluation in Real Time (ALERT) sensor detection network in the watershed;
- Comparing the flow rate at which overbank flooding occurs with the precipitation necessary to produce that flow rate;
- Determining the locations of structures and road crossings in the floodway, floodplain, and Severe Erosion Hazard Zone; and
- Examining the travel time to these locations from existing and planned stream gages as well as the approximate frequency of the beginning of inundation at these locations.

The results of the assessment indicated that the primary need for flood warning in the Skunk Creek watershed is for closure of at-grade road crossings. A secondary need for larger floods is the warning and evacuation of structures which are located within the Skunk Creek floodway and those structures located outside the floodway, but within the Severe Erosion Hazard Zone. The rapid basin response time of streams in the Skunk Creek watershed and the somewhat remote location of the area limit the nature of, and means for, flood warning. Finally, development within the downstream portions of the study area may change the flood warning needs as future development proceeds. Flood warning needs should be re-evaluated as development occurs.

6.1.2 Flood Warning System Components

An effective flood warning system combines several vital elements. The first element is the ability to detect and evaluate a flood threat in its early stages and make a decision to warn the public before flood damages or personal injuries occur. The second element is the

dissemination of the warning to the public at risk. The third element is the public response to the warning. The fourth element is the post-flood action plan. The following is a brief description of each of these components relative to the Skunk Creek FWS.

6.1.2.1 Flood Detection

The earliest recognition of a potential flood threat for the Skunk Creek basin will be the forecast products available from the District and NWS. The Precipitation Outlook (PO) forecast provided by the Flood Control District of Maricopa County Meteorological Services Program (MSP) provides an initial daily assessment of the flooding potential of the atmosphere and a basin-specific quantitative precipitation forecast (QPF). The MSP provides, via broadcast fax, a series of flood alert messages of increasing severity and urgency to agencies participating in the program. The MSP service supplements standard NWS forecast products and the flash flood watch and flash flood warning messages issued by the NWS. MSP forecasts and messages are more site-specific to the Skunk Creek watershed. District MSP messages are coordinated with the NWS Weather Forecast Office at Phoenix. Depending on staffing and personnel assigned by the District, FCDMC flood alert messages and NWS flash flood watches and flash flood warnings could be issued in an agreed upon sequence to residents in areas impacted by flooding along Skunk Creek. The flood warning message suite is described in more detail in Section 6.4.

The automated rain gages and stream gages in the Skunk Creek basin and adjacent watersheds transmit rainfall data and real-time streamflow measurements to District personnel and the NWS. The effectiveness of the Skunk Creek FWS is highly dependent upon adequate rainfall and streamflow data collected by the sensors comprising the flood detection network for the Skunk Creek watershed. Therefore, one new stream gage and three new rain gages are scheduled to be installed to supplement the existing rain and stream gages on Skunk Creek near New River (#5580 and #5583, respectively). The new stream gage is planned on Cline Creek, a major tributary that joins Skunk Creek downstream of the existing stream gage. In addition, a new rain gage will be co-located at

this site. One new rain gage is planned for each of the upper watersheds of Skunk and Cline Creeks. These new gages should substantially improve the hydrologic data available for the District to support decisions concerning road closures and trigger the flood response plan action protocols based upon pre-determined flood detection criteria and sensor threshold alarms. More information about the flood detection network and detection criteria is provided in Section 3.

6.1.2.2 Information Dissemination

An interim program to disseminate flood warning messages to the public and to emergency response agencies is recommended to the District, and could be accomplished using NOAA weather radios and pagers. Notification via multiple paths is provided for redundancy and robustness of the FWS. The NWS will issue warning messages to the public via:

- Emergency Alert System (EAS) – The system consists of radio and television broadcast stations in the Phoenix operational area that are responsible for disseminating emergency information and warnings to the public. EAS broadcasts by commercial media are voluntary, but experience shows that the stations regularly transmit NWS messages.

- NOAA Weather Radio (NWR) – NWS issues flash flood watch and flash flood warning messages via NOAA Weather Radio according to standard protocol using tone alarms followed by voice messages.

The District's program could then send text flood alert messages via pager to residents in the Skunk Creek floodway and Severe Erosion Hazard Zone, as appropriate. The District's flood alert messages would be sequenced with the NWS flash flood watch and flash flood warning message suite. Information dissemination and communication means and paths are described in Section 6.3.

6.1.2.3 Emergency Flood Response

Once a potentially hazardous flood event is detected and this information is communicated to appropriate agencies and affected individual parties, those entities must implement emergency response activities. The recommended response component of the FWS for the Skunk Creek warning area consists of three primary components: Technical Memorandum, Flood Response Plan Field Book, and the Flood Response Plan Menus. These are described in Section 1.3 of this document and in the FRP Field Book Introduction.

6.1.2.4 Post-Flood Action Plan

Post-flood actions include, but are not limited to, criteria for re-occupation of structures, an After-Action Report, relations with the news media, and government assistance for flood victims (both private and agencies). The Skunk Creek Flood Response Plan is intended to be added as an Appendix to the FCDMC Flood Emergency Response Manual and the MCDEM Emergency Operations Plan. Post-flood action protocols, as addressed in both the FCDMC and MCDEM documents, are incorporated by reference herein to the Skunk Creek Flood Response Plan Report, Technical Memorandum, and FRP menus. Refer to the FCDMC and MCDEM documents for further information.

6.2 Lead Time Estimation

The methodology for estimation of lead time for the Skunk Creek Flood Response Plan was adopted from the Wickenburg Flood Response Plan (FCDMC, 1999). The following definitions and descriptions of procedures for the determination of hydrologic, decision, action, and effective lead times are replicated below in italics from those respective sections of the FCDMC Wickenburg Flood Response Plan Technical Addendum (1999). Modifications to that text relative to the Skunk Creek FRP are shown in normal font.

> *The design of an effective flood response plan is driven by the amount of lead time available for response agencies to mobilize and implement*

emergency response efforts. The hydrologic lead time is set by the basin response to rainfall. The travel time of the runoff to flood vulnerable areas is set by hydraulic characteristics of the conveyance channels to those areas. The sum of basin response time and hydraulic travel time constitutes the hydrologic lead time. The emergency response time is determined by the decision time needed to assess the flood event and issue warnings, and by the readiness of the local emergency response agencies to implement the appropriate action plans.

The balance of hydrologic lead time relative to emergency response time comprises the effective lead time. The magnitude of the resulting effective lead time determines whether the flood response plan for a particular watershed is ***proactive*** *– triggered by the prediction of the runoff-producing rainfall – or* ***reactive*** *– relying on the detection of the event by watershed instrumentation – or a* ***combination of both****.*

The FRP for the Skunk Creek warning area is divided into groups, or clusters, of at-risk structures according to geographic location along the watercourse. For each group, the travel time increases with increasing downstream distance, thereby increasing hydrologic lead time and effective lead time. Decision makers in a flood emergency **must exercise caution** in the use of, and reliance upon, the lead times provided in Table 6-1. These lead times are **estimates only**, based upon the best available technical information, and **should not be strictly interpreted. They should only be used as an indicator of the urgency of the necessary response actions and as a decision-making tool for prioritization of the response activities.**

6.2.1 Hydrologic Lead Time

Hydrologic lead time refers to the response time of a watershed to runoff-producing rainfall. This ***basin response time*** *is defined as the lag time from the occurrence of the highest rainfall intensity to the time of peak discharge. Basin response times are estimated for the* Skunk Creek groups of flood vulnerable structures (as described in Section 4.4). *Hydraulic* ***travel time*** *is the estimated time the flood takes to travel from an upstream location to the identified flood vulnerable areas downstream.* Section 4.5 *addresses the calculation of hydraulic travel time to* each of the Skunk Creek groups. Those findings are presented in Columns (3) and (4) of Table 6-1, respectively. *The sum of the basin response and travel lead times constitutes the* ***hydrologic lead time*** *for those watercourses.*

The optimal use of the hydrologic lead time period is to place the emergency response agencies on a heightened level of awareness to the potential flooding problem. Depending on the severity of the potential flooding problem, varying degrees of awareness and action may be evoked. In effect, the hydrologic lead time should provide enough time to avoid flooding surprises to the response agencies and afford them the opportunity to prioritize response in an orderly fashion. The hydrologic lead time may be provided by weather prediction, radar observation of the storm, or the alarm response of a flood detection network's rain or stream gages to observed rainfall or steam flow (as described in Section 3).

6.2.2 Decision/ Action Lead Time

The emergency response time is determined by the decision time needed to assess the flood event and issue warnings, and by the readiness of the local emergency response agencies to implement the appropriate action plans.

The ***decision lead time*** *refers to the amount of time required by the meteorologist and/or hydrologist to:*

1. *verify that a flash flood or flooding problem is imminent based on prediction tools or that flooding is occurring based on detection data;*
2. *identify the relative magnitude of the flooding event based on pre-determined criteria; and*
3. *issue the appropriate alert warning to local response agencies so that the applicable FRP action plans may be triggered.*

In effect, the decision lead time is a measure of the amount of time required by technical experts to verify that a problem exists and to issue a warning. Decision lead times are estimated for Skunk Creek warning area, as shown in Columns (5) and (6) of Table 6-1. The decision lead time component was estimated by interviews with staff of the District Flood Warning Branch and National Weather Service Phoenix Office. A range of values is included to account for variation in the degree of complexity in interpreting data and information from incoming sources.

The ***action time*** *component is the sum of the time required by the response agencies to acknowledge and respond to the flood alert messages, commit resources to the various components of the action plans, and to implement the appropriate response action.*

The action lead time values for the selected information dissemination method (Option E as described in Section 6.3.2) are shown in Columns (7) and (8) of Table 6-1. They were

obtained by interviewing appropriate staff of the City of Phoenix 911 Central Alarm, Maricopa County Department of Emergency Management, and Daisy Mountain Fire Department. A range of values is provided to account for unforeseen difficulties in flood response activities inherent to any given flood event.

6.2.3 Effective Lead Time

> *The **effective lead time** available for the implementation of a flood response plan is the time period afforded* to the residents of the floodway and Severe Erosion Hazard Zone to evacuate *before a flood reaches inescapable proportions. The estimate of that critical evacuation window, the comparative balance of the hydrologic lead time to the emergency response lead time, is evaluated.*

The evaluation of the effective lead time for the flood vulnerable areas of the Skunk Creek floodway indicates that those values vary considerably, as shown in Columns (9) and (10) of Table 6-1. Those lead times range from negative values – implying the need for strong predictive capabilities for flooding in the Skunk Creek basin – to relatively small positive values – signifying that the project team must focus on minimizing the emergency response times with the most efficient information dissemination tools possible. This approach will minimize reliance upon prediction of precipitation and flood events as much as possible.

TABLE 6-1: LEAD TIME FOR FLOOD VULNERABLE AREAS BY GROUP

Group (1)	Location (2)	Hydrologic Lead Time		Emergency Response Time				Effective Lead Time	
				Decision Time		Action Time (Option E)			
		Basin Response [min] (3)	Travel Time [min] (4)	Minimum [min] (5)	Maximum [min] (6)	Minimum [min] (7)	Maximum [min] (8)	Minimum [min] (9)	Maximum [min] (10)
Zorrillo Drive	First inundated home: Kraus Invest. mobiles	20	23	10	15	10	40	-12	23
	Shangri La Lane	20	23	10	15	10	40	-12	23
Cline Creek	First inundated home: Selleys house	20	17	10	15	10	40	-18	17
Honda Bow Road	First inundated home: McKeag house	20	20	10	15	10	40	-15	20
	Honda Bow Road	20	20	10	15	10	40	-15	20
	Circle Mountain Road	20	20	10	15	10	40	-15	20
	Rodger Creek crossing	20	20	10	15	10	40	-15	20
Desert Hills Drive	First inundated home: Hopwood Trust mobile	20	42	10	15	10	40	7	42
	Desert Hills Drive	20	42	10	15	10	40	7	42
	19th Avenue	20	42	10	15	10	40	7	42
	Cloud Rd / 27th Ave.	20	42	10	15	10	40	7	42

6.3 Information Dissemination

The range of effective lead times from negative to positive values directly influences the options available for dissemination of District flood alert messages and NWS flash flood watches and flash flood warnings to the emergency response agencies and to the public. First, a highly reliable and efficient, almost instantaneous, means of communicating flood warning messages to the emergency response agencies is necessary to minimize the action time required to implement the agency emergency response plans. Second, due to minimal effective lead time and the wide spatial distribution of the property owners in flood vulnerable areas of the floodway, those property owners need to be warned of impending and/or occurring flood events on an individual basis in order to minimize the time required for implementing individualized emergency action plans and for evacuating to the destination sites.

6.3.1 Information Dissemination Options

Initially, four information dissemination options (A through D) were evaluated. Option E evolved after sirens were not favorably considered for inclusion in the Skunk Creek FWS and pagers were substituted as viable alternatives to provide redundancy for warning messages transmitted via the NOAA Weather Radio system. The options considered are listed below:

A Emergency Notification Program (ENP) Telephone System/ Sirens
B Tone Alert Receiver/ Sirens
C NOAA Weather Radio/ Sirens
D Traditional Door-to-Door Notification
E NOAA Weather Radio/ Pagers

A summary matrix is provided in Table 6-2 of action times, effective lead times, key features, cost, implementation, and viability for side-by-side comparison of each option.

TABLE 6-2: SUMMARY MATRIX OF INFORMATION DISSEMINATION OPTIONS

DECISION CRITERIA	A ENP TELEPHONE SYSTEM/ SIRENS	B TONE RECEIVER/ SIRENS	C NOAA RADIO/ SIRENS	D TRADITIONAL	E NOAA RADIO/ PAGERS
Action Time Range (minutes)	5 to 35	5 to 35	10 to 40	30 to 60	10 to 40
Effective Lead Time Range (minutes)	-16 to 47	-16 to 47	-21 to 42	-41 to 22	-21 to 42
Key Features	▪ Turn-key system ▪ Remote activation ▪ Multiple messages ▪ Instantaneous action time ▪ Siren redundancy	▪ Turn-key system ▪ Remote activation ▪ Multiple messages ▪ Instantaneous action time ▪ Siren redundancy	▪ Existing system ▪ Remote activation ▪ Multiple messages ▪ ~ Instantaneous action time ▪ Siren redundancy	▪ FCDMC contacts MCDOT for barricades ▪ Individuals contact response agencies via 911 system	▪ Existing system ▪ Remote activation ▪ Multiple messages ▪ ~ Instantaneous action time ▪ Pager redundancy
Cost	▪ Set-up - $16,500 ▪ Monthly - $0.05/ line/ month ▪ Event-specific - $0.23/ 30 sec of connect time ▪ Sirens – 3 @ $12,000 ea., in place ▪ MCDEM sirens may be available	▪ Receivers - $221 ea. ▪ Sirens – 3 @ $12,000 ea., in place ▪ MCDEM sirens may be available ▪ Encoder - $495 ▪ Portable 2-way radio	▪ Radios - $20-60 ea. ▪ Sirens – 3 @ $12,000 ea., in place ▪ MCDEM sirens may be available ▪ Unknown costs for MCDEM siren installation and encoder hardware	▪ None beyond current funding	▪ Radios - $20-60 ea. ▪ Pagers - $10.95-13.95 ea./ month lease OR $139 ea. to purchase ▪ Paging Service - $3.50/ month/ pager w/ purchase option only ▪ Group Paging Service - $1.50/ month/ pager
Implementation	▪ 6 – 8 weeks for study area ▪ County-wide implementation planned in about 1 year	▪ Requires County license to operate select frequencies ▪ Orders must be placed by June 11, 2001	▪ Requires timely coordination between agencies ▪ Potential FEMA grant program to fund radio distribution	▪ Currently in place	▪ Requires timely coordination between agencies ▪ Requires timely procurement of radios and pagers ▪ Signal strength and transmission issues may exist
Viability	Long-term viability, but not before August 2001	Viable by August 2001	Viable by August 2001	Least effective lead time of four options evaluated	Viable by August 2001 w/ timely procurement

The Skunk Creek WCMP Steering Committee met on June 5, 2001 to evaluate information dissemination options A through D, among other agenda items. The Steering Committee directed the project team to proceed with Option C - NOAA Weather Radio/ Sirens. Justification for this decision included the following:

- **Option A:** The Emergency Notification Program (ENP) telephone system offers the most expedient information dissemination method evaluated. It offers turn-key implementation, instantaneous action time, expandability to other geographic areas, message flexibility, and after-event reporting, but it is expensive to deploy at such a small scale. Current plans by the Maricopa County 911 Oversight Committee include county-wide implementation of this system in about one year. The immediate flood warning needs of the Skunk Creek watershed require shorter-term solutions. In addition, sirens were not favorably considered for reasons described under Option C below.

- **Option B:** While the Tone Alert Receiver/ Siren system satisfies key decision criteria, it is costly to implement in the short-term given the pending county-wide launch of the ENP telephone system. In addition, sirens were not favorably considered for reasons described under Option C below.

- **Option C:** The NOAA Weather Radio/ Siren system offers similar advantages compared to Option B and utilizes the existing Weather Radio notification system. Option C minimizes short-term investment in equipment, while providing almost instantaneous flood warning capabilities with proper advance preparations of warning message formats. Sirens were included in Options A, B, and C to provide redundancy and robustness to the FWS, but the District elected to not use sirens at a subsequent meeting on June 26, 2001. This was due to District concerns about false alarms and the potential for confusion on the part of residents between siren alarms for flood warning and siren alarms for other types of emergencies that require

response from the Maricopa County Sheriff's Office, Rural Metro Fire Department, and Daisy Mountain Fire Department. Some residents also indicated at the Public Open House held on June 28, 2001 that they would prefer not to have sirens disturbing the rural quiet that they had moved to Skunk Creek to enjoy.

- **Option D:** The current Traditional Door-To-Door Notification for the Skunk Creek study area is reliable, but it does not provide the necessary effective lead times due to the flashy basin response to rainfall and rapid travel times in the channels.

6.3.2 Recommended Option

A June 8, 2001 meeting was held to discuss the necessary steps required to implement information dissemination Option C, using the existing NOAA Weather Radio Service and fixed outdoor sirens, to provide weather alert and flood warning to residents located in the Skunk Creek warning area. The agencies represented at that meeting included the Flood Control District of Maricopa County (FCDMC), National Weather Service (NWS), Maricopa County Department of Emergency Management (MCDEM), and Arizona Division of Emergency Management (ADEM).

The group consensus was that the use of NOAA Weather Radio for this purpose was feasible; however, it was not possible to install the sirens in time to meet the August 2001 implementation deadline. In addition, other concerns about potential confusion on the part of residents as to the significance of siren alarms for floods versus other, more common, emergencies were discussed. The consensus was that sirens would not be preferred for use for flood warning in Skunk Creek. The use of a group paging system was identified as a viable alternative to the sirens. Under this scenario, residents at risk due to Skunk Creek flooding would be equipped with a pager, a NOAA Weather Radio, and a Flood Response Plan "menu" describing their individualized action plan in the event of a flood emergency. This program could be launched on or about the August 2001 deadline, depending upon timely procurement of the pagers and radios.

The group discussed the inter-agency coordination and warning message sequence and content. It was agreed that both the District and NWS would initiate messages in an alternating sequence to Skunk Creek residents as listed below and as described in detail in Section 6.4:

- FCDMC would send text weather alert and flood warning messages via pager; and
- NWS would issue flash flood watch and flash flood warning tone alarms followed by voice messages via the NOAA Weather Radio Service.

Some concerns were expressed about interference of pager and radio messages in the Skunk Creek basin and NWS agreed to investigate the signal strength for NOAA Weather Radio reception in the study area. A field test of a text message pager and a weather radio was subsequently conducted on July 6, 2001 during weather conditions typical of that to be expected during a flood event with full cloud cover and moderate rain. The pagers performed very well, even when positioned in the bottom of the Skunk Creek channel. In every location tested, the pagers received the flood warning message text encoded using the Internet.

The NOAA Weather Radio (NWR) performed less well with static reception in certain locations. The NWR seemed more susceptible to signal interference due to topography, with reception ranging from marginal to good depending upon location. It was decided that the District would proceed with the use of NWR as a means of transmitting NWS flash flood watch and flash flood warning messages to Skunk Creek residents. The pager will provide the means for transmitting the more site-specific, District-generated flood alert messages. It is recommended that a house-to-house evaluation of NWR reception be conducted and documented once the radios are distributed to the residents. If NOAA Weather Radio reception proves to be an ongoing problem, then additional transmitting capacity may need to be acquired for this system to function with full reliability. Issues of transmitter power, location, and cost will need to be addressed at that time. Alternatively, a weather paging service offered by private vendors is also an option. A weather paging

service could automatically dial-up pagers encoded with a 6-digit code for Phoenix and Maricopa County when NWS flash flood watch and flash flood warning messages are issued for that specific area.

In consideration of the above, the **Option E** NOAA Weather Radio/ Pager information dissemination system is recommended for implementation in the Skunk Creek warning area. The preparation of the flood response plan is predicated upon the final selection by the District of this information dissemination option at a Steering Committee meeting on June 26, 2001. Appendix E contains an overview sheet summarizing the products, contact information, features, costs, and important considerations for Option E.

6.3.3 Communications Schematic

The flow of information and communications in the FRP among personnel within the participating agencies will be by normal methods now in operation. MCDEM is the central contact for all communications concerning the Skunk Creek watershed. FCDMC and NWS are responsible for relaying weather and flood information to other participant agencies and to the public, most importantly the Skunk Creek residents in the flood warning area. During emergency operations, personnel from one agency wishing to communicate with personnel with another agency should follow their own jurisdiction's incident command system.

Primary communication between FCDMC, NWS, and MCDEM will be by telephone. The Maricopa County response agencies, including MCDEM, MCDOT and MCSO, will use assigned frequencies within the County's internal radio communication system to communicate with field personnel and the FCDMC Flood Warning Branch.

Figure 6-1 is a visual representation of the communication path between the sources of flood information and the end users of that information. The following is a brief description of the intended internal communication flowpaths:

1. FCDMC and NWS hydrologists and meteorologists will monitor incoming weather, rainfall, and streamflow data from various sources, including the observations of local spotters, as shown in Figure 6-1. Given indications of potential runoff-producing storms in the Skunk Creek watershed, the FCDMC or NWS will initiate, and both will maintain, communication with each other for the duration of the storm event.

2. The FCDMC will contact MCDOT and MCDEM via telephone or using Maricopa County's internal radio communications system. MCDEM will also be included in the pager call list for FCDMC weather alert and flood warnings.

3. During emergency operations, MCDEM, MCDOT, and MCSO will maintain communication with each other and the FCDMC via the County internal radio system or telephone according to the protocol established by Maricopa County Emergency Operations Plan (1999).

4. MCDEM will contact Daisy Mountain Fire Department (DMFD) directly via telephone. MCDEM will also maintain contact with FCDMC and NWS and monitor evolving weather conditions. When school is in session, MCDEM will contact the Deer Valley Unified School District to inform them of flood potential so that the school district may make decisions about student dismissal and bus transportation.

5. MCDOT Traffic Operations will dispatch barricade crews via the County internal radio system or telephone.

6. MCSO may contact DMFD and/or Rural Metro Fire Department (RMFD) depending upon the particular needs of the flood situation and the jurisdictional boundaries of the fire departments. A map showing the fire department response areas in the Skunk Creek watershed is provided in Figure 6-2. While these

boundaries are generally followed, DMFD and RMFD will support emergency response needs across jurisdictional boundaries when the immediate situation warrants.

7. FCDMC will send weather alert and flood warning messages to Skunk Creek floodway and Severe Erosion Hazard Zone residents via pager. The message suite is described in Section 6.4.

8. NWS will issue flash flood watches and flash flood warnings according to standard protocol. Those message shall be transmitted via NOAA Weather Radio Service to the public, including the Skunk Creek residents in the flood warning area. Those messages shall also be transmitted voluntarily via the Emergency Alert System (EAS) over commercial radio and television networks.

9. Any incoming emergency calls relative to flooding in the Skunk Creek watershed received from the public via the 911 emergency dial-up system will automatically be dispatched by Phoenix Central Alarm to MCSO, Rural Metro, and/or Daisy Mountain Fire Department according to an existing computer-based routing system for emergency response.

In the interim period until the weather radios and pagers are distributed and all components of the Skunk Creek FWS are in place, a short-term measure is established to provide flood warning to residents. The FCDMC and NWS will conduct the weather monitoring and flood warning activities as described above. The NWS will continue to issue standard weather forecast products and flash flood watches and warnings via the EAS and NOAA Weather Radio. However, in lieu of FCDMC-issued flood alert messages via pager, MCDEM will provide telephone dial-up services to individually contact residents in the Skunk Creek floodway and Severe Erosion Hazard Zone. Emergency response agencies including MCDOT, MCSO, Rural Metro, and DMFD will function as described above.

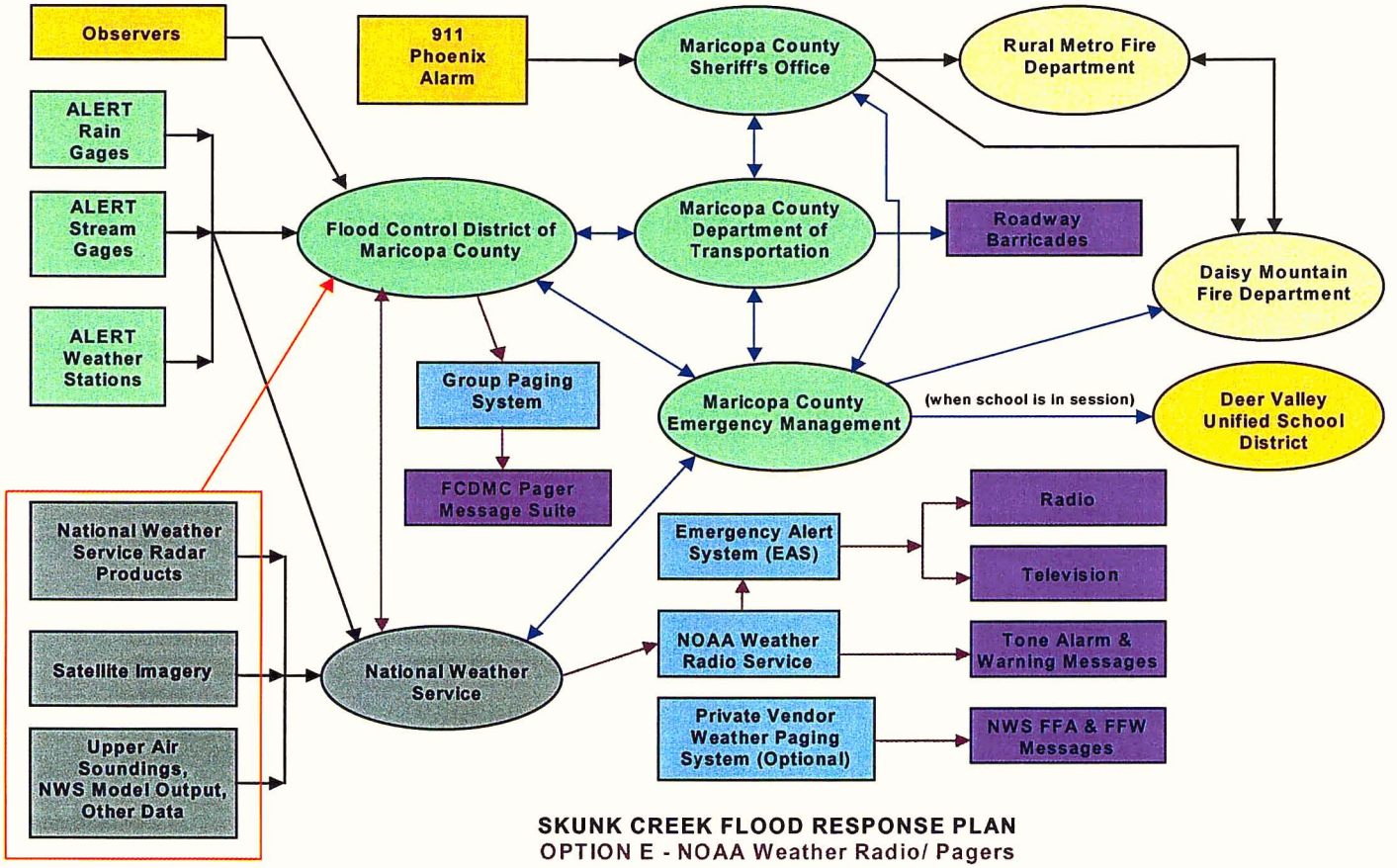


FIGURE 6-1: COMMUNICATIONS FLOWCHART

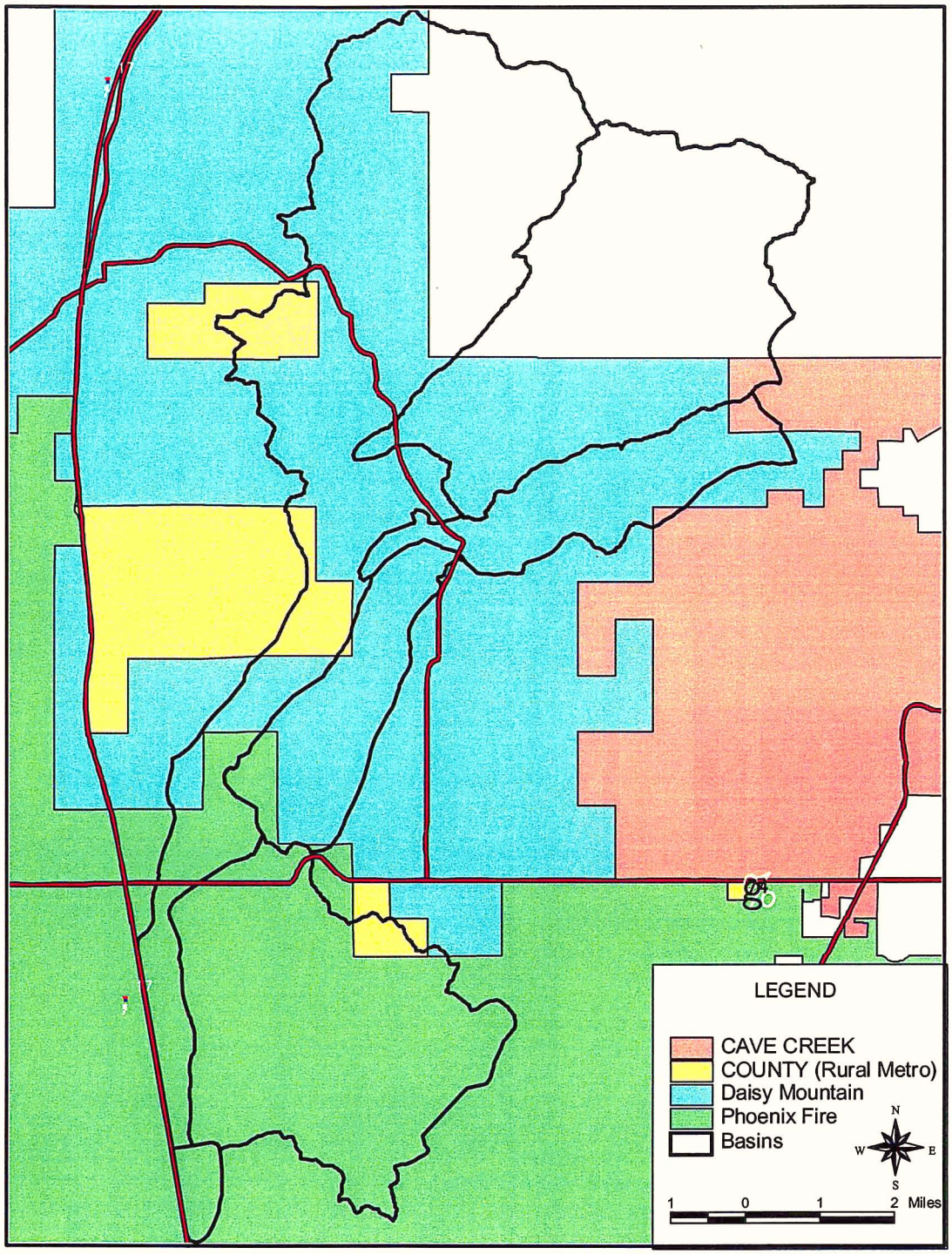


FIGURE 6-2: FIRE DEPARTMENT RESPONSE AREAS IN THE SKUNK CREEK WATERSHED

6.4 Flood Warning Message Suite

At a June 8, 2001 meeting, the NWS and FCDMC agreed to work jointly on providing a suite of flood alert, flash flood watch, and flash flood warning messages to the participants in the Skunk Creek FRP. These warning messages will be provided in a sequence of increasing urgency as flood threat intensifies and response time diminishes. It was agreed that both the FCDMC and NWS will initiate messages in an alternating sequence to Skunk Creek residents as itemized in Table 6-3:

- FCDMC will send text weather alert and flood warning messages via pager.
- NWS will issue flash flood watch and flash flood warning tone alarms followed by voice messages via NOAA Weather Radio Service.

Table 6-3 presents the message sequence, source agency, communication means, message content, and corresponding rainfall/runoff condition status. The flood detection criteria described in Section 3.3 trigger the progression of the message sequence to increasing **or** decreasing levels of alert as evolving flood conditions warrant. The emergency action plans of the Skunk Creek FRP for individual residents of the Skunk Creek warning area and by participating agencies are described in Section 6.5. The implementation of those action plans is linked directly to the dissemination of the various flood alert messages (Table 6-3) as triggered by the flood detection criteria (Table 3-1).

TABLE 6-3: SKUNK CREEK FRP MESSAGE SEQUENCE AND CONTENT

MESSAGE SEQUENCE	SOURCE AGENCY/ COMMUNICATION MEANS	MESSAGE CONTENT (effective times)	FLOOD CONDITION STATUS
NWS FFA	National Weather Service/ **NOAA Weather Radio** (voice message, tone alarm optional) **EAS Commercial radio/ TV**	National Weather Service **Flash Flood Watch** (begin time/ end time)	➢ Flash flooding is possible in north-central Maricopa County, including Skunk Creek or Cline Creek.
FCDMC 1	Flood Control District of Maricopa County/ **Pager**	Skunk Creek Message 1 **Weather Alert** (begin time/ end time)	➢ Flash flooding is possible in north-central Maricopa County, especially in the upper Skunk Creek and Cline Creek areas.
FCDMC 2	Flood Control District of Maricopa County/ **Pager**	Skunk Creek Message 2 **Flash Flood Alert** (begin time/ end time)	➢ Heavy rainfall detected in the upper Skunk Creek or Cline Creek watersheds. ➢ Moderate flow volumes detected by stream gages ➢ Potential for life-threatening flooding exists
NWS FFW	National Weather Service/ **NOAA Weather Radio** (tone alarm followed by voice message) **EAS Commercial radio/ TV**	National Weather Service **Flash Flood Warning** (begin time/ end time)	➢ Flash flooding is imminent or occurring in north-central Maricopa County, including Skunk Creek or Cline Creek.
FCDMC 3	Flood Control District of Maricopa County/ **Pager**	Skunk Creek Message 3 **Severe Flood Warning** (effective time/ all clear)	➢ Extreme rainfall detected in the upper Skunk Creek or Cline Creek watersheds. ➢ Critical flow volumes detected by stream gages. ➢ Severe flash flooding is imminent or occurring. ➢ Many or all roadway crossings in the area are impassable.
FCDMC 4	Flood Control District of Maricopa County/ **Pager**	Skunk Creek Message 4 **All Clear** (effective time)	➢ Floods on Skunk and Cline Creek have dropped below critical levels. ➢ Potential for additional extreme flooding is minimal.

NOTE: The message progression may shortcut to FCDMC Message 3 or 4 at any point in the sequence as evolving flood conditions warrant. If a NWS Flash Flood Watch is in effect early in the day, the warning message sequence may shortcut to NWS Flash Flood Warning, as appropriate to changing weather conditions.

6.5 Action Plans

Once a rainfall/ runoff event is occurring of sufficient magnitude so as to meet or exceed the established flood detection thresholds (Table 3-1), warning messages are issued (Table 6-3) using the information dissemination tools (Section 6.3.2) and communication flowpaths (Figure 6-1) previously established. Governmental and emergency response agencies participating in the Skunk Creek FRP, and individual residents in the warning area, must implement their respective emergency response action plans. Participating agencies will follow the action plans described herein within the context of their own jurisdiction's incident command system. Individual residents will follow the action plans described herein and as provided on their FRP menus.

6.5.1 Agency Action Plans

Each FCDMC weather alert and/or flood warning, NWS flash flood watch, and flash flood warning message is related to a different degree of flood threat and consequently requires a different associated response by the emergency response agencies. The message sequence is structured in a manner of increasing urgency triggered by imminent or occurring flooding in the floodway and in the Severe Erosion Hazard Zone. This graduated flood warning message suite is associated with a similarly stepped action plan comprised of emergency response activities of increasing urgency. Table 6-4 presents the emergency action plans for each agency. Table 6-5 provides contact information for each agency.

The agency action plans do not contain detailed operational procedures; rather, they provide an overview of technical support activities, communications, emergency operations and general responsibilities of each participating organization. Specific task assignments and responsibilities are described in these agencies' emergency operations plans and supplemental documents. Similarly, the technical support organizations (NWS and FCDMC) routinely update their own internal operating procedures, policies, and duty manuals.

TABLE 6-4: SKUNK CREEK FRP AGENCY ACTION PLANS

MESSAGE SEQUENCE	NWS National Weather Service	FCDMC Flood Control District of Maricopa County	MCDEM Maricopa County Department of Emergency Management	MCDOT Maricopa County Department of Transportation	MCSO Maricopa County Sheriff's Office	DMFD Daisy Mountain Fire Department	RMFD Rural Metro Fire Department
NWS FFA	➢ Monitor incoming weather, rainfall, streamflow data ➢ **Issue Flash Flood Watch** ➢ Establish communication with FCDMC	➢ Monitor incoming weather, rainfall, streamflow data ➢ Establish communication with NWS and MCDEM	➢ Monitor incoming weather, rainfall, streamflow data ➢ Establish communication with FCDMC				
FCDMC 1	➢ Monitor incoming weather, rainfall, streamflow data ➢ Maintain communication with FCDMC ➢ Establish communication with MCDEM	➢ Monitor incoming weather, rainfall, streamflow data ➢ **Issue Weather Alert** ➢ Maintain communication with NWS and MCDEM ➢ Establish communication with MCDOT	➢ Monitor incoming weather, rainfall, streamflow data ➢ Maintain communication with FCDMC ➢ Establish communication with NWS, MCDOT, MCSO, RMFD, and DMFD	➢ Monitor incoming weather information ➢ Establish communication with FCDMC and MCDEM ➢ Ready barricade crews	➢ Monitor incoming weather information ➢ Establish communication with MCDEM ➢ Ready district command office	➢ Monitor incoming weather information ➢ Establish communication with MCDEM and RMFD ➢ Ready local station crews	➢ Monitor incoming weather information ➢ Establish communication with MCDEM and DMFD ➢ Ready local station crews
FCDMC 2	➢ Monitor incoming weather, rainfall, streamflow data ➢ Maintain communication with FCDMC and MCDEM	➢ Monitor incoming weather, rainfall, streamflow data ➢ **Issue Flash Flood Alert** ➢ Maintain communication with NWS, MCDEM, and MCDOT ➢ Trigger MCDOT barricade crews	➢ Monitor incoming weather, rainfall, streamflow data ➢ Maintain communication with NWS, FCDMC, MCDOT, MCSO and DMFD ➢ Establish communication with evacuation sites and school district office	➢ Monitor incoming weather information ➢ Maintain communication with FCDMC and MCDEM ➢ Dispatch barricade crews to Skunk Creek road crossings. ➢ Monitor area road conditions	➢ Monitor incoming weather information ➢ Maintain communication with MCDEM ➢ Establish communication with DMFD and RMFD ➢ Alert district personnel in area	➢ Monitor incoming weather information ➢ Maintain communication with MCDEM and RMFD ➢ Establish communication with MCSO ➢ Maintain local station crews on alert	➢ Monitor incoming weather information ➢ Maintain communication with DMFD ➢ Establish communication with MCSO ➢ Maintain local station crews on alert
NWS FFW	➢ Monitor incoming weather, rainfall, streamflow data ➢ **Issue Flash Flood Warning** ➢ Maintain communication with FCDMC and MCDEM	➢ Monitor incoming weather, rainfall, streamflow data ➢ Maintain communication with NWS, MCDEM, and MCDOT	➢ Monitor incoming weather, rainfall, streamflow data ➢ Maintain communication with NWS, FCDMC, MCDOT, MCSO and DMFD ➢ Maintain communication with evacuation sites and school district office	➢ Monitor incoming weather information ➢ Maintain communication with FCDMC and MCDEM ➢ Complete roadway barricade activities. ➢ Maintain barricade crews on alert ➢ Monitor area road conditions	➢ Monitor incoming weather information ➢ Maintain communication with MCDEM, DMFD, and RMFD ➢ Maintain district personnel in area on alert	➢ Monitor incoming weather information ➢ Maintain communication with MCDEM, MCSO, and RMFD ➢ Maintain local station crews on alert ➢ Ready evacuation sites	➢ Monitor incoming weather information ➢ Maintain communication with DMFD and MCSO ➢ Maintain local station crews on alert
FCDMC 3	➢ Monitor incoming weather, rainfall, streamflow data ➢ Maintain communication with FCDMC and MCDEM	➢ Monitor incoming weather, rainfall, streamflow data ➢ **Issue Severe Flood Warning** ➢ Maintain communication with NWS, MCDEM, and MCDOT	➢ Monitor incoming weather, rainfall, streamflow data ➢ Maintain communication with NWS, FCDMC, MCDOT, MCSO and DMFD ➢ Maintain communication with evacuation sites and school district office	➢ Monitor incoming weather information ➢ Maintain communication with FCDMC and MCDEM ➢ Maintain barricade crews on alert ➢ Monitor road conditions along evacuation routes	➢ Monitor incoming weather information and communication ➢ Monitor evacuation routes for residents in need of assistance ➢ Secure affected areas ➢ Verify that residents have evacuated by checking for sheet hanging on front door	➢ Monitor incoming weather information ➢ Maintain communication with MCDEM, MCSO, and RMFD ➢ Assist in evacuations, as needed ➢ Receive and register residents at evacuation sites	➢ Monitor incoming weather information ➢ Maintain communication with DMFD and MCSO ➢ Assist in evacuations as needed
FCDMC 4	➢ Monitor incoming weather, rainfall, streamflow data ➢ Maintain communication with FCDMC on as-needed basis	➢ Monitor incoming weather, rainfall, streamflow data ➢ **Issue All Clear** ➢ Maintain communication with NWS and MCDEM on as-needed basis	➢ Monitor incoming weather, rainfall, streamflow data ➢ Maintain communication with FCDMC on as-needed basis ➢ Notify MCDOT to retrieve roadway barricades	➢ Retrieve barricades ➢ Perform roadway clearing and/or repair activities, as required	➢ Provide post-flood assistance to residents returning to properties ➢ Control vehicular and personnel access to affected areas, as required	➢ Provide post-flood assistance to residents returning to properties	➢ Provide post-flood assistance to residents returning to properties

TABLE 6-5: SKUNK CREEK AGENCY CONTACT LIST

AGENCY	CONTACT	PHONE NUMBER
NWS	General	(602) 275-7002
FCDMC	ALERT Room	(602) 506-8701
MCDEM	Duty Officer	(602) 273-1411
MCDOT	Traffic Operations	(602) 506-4180
MCSO	District 4 North	(602) 256-1742
DMFD	Administration Pager	(623) 465-7400 (602) 673-0695
RMFD Cave Creek/ Carefree	Administration Pager	(480) 994-3886 (480) 627-6607
Deer Valley Unified School District	Administrative Services General	(623) 445-4951 (623) 445-5000

6.5.2 Resident Action Plan

A similar action plan, together with an aerial photograph showing evacuation routes and sites, is provided as a "menu" for use by the residents of the Skunk Creek FRP warning area. The menus are customized according to flood hazard group along Skunk Creek (Section 2.3). These groups include Desert Hills Drive, Honda Bow Road, Cline Creek, and Zorrillo Drive. Table 6-6 presents the emergency action plan for the residents in a stepped sequence similar to the graduated warning message suite. Appendix F includes the full FRP menus for each group.

TABLE 6-6: SKUNK CREEK FRP RESIDENT ACTION PLANS

WHICH MESSAGE (likely sequence)	WHO/ HOW Source Agency/ Communication Means	WHAT IT SAYS Message Content (effective times)	WHAT IT MEANS Alert Protocol	WHAT YOU NEED TO DO Actions Required
NWS FFA	National Weather Service/ **NOAA Weather Radio** (voice message, tone alarm optional) **EAS Commercial radio and/or TV**	National Weather Service **Flash Flood Watch** (begin time/ end time)	➢ Flash flooding is possible in north-central Maricopa County, including Skunk Creek or Cline Creek. ➢ Be alert!	➢ Monitor your FCDMC pager and NOAA weather radio continually for updates. Other sources of flood information include: - Some commercial radio and TV stations voluntarily broadcast NWS flash flood watch warning information. - Real-time FCDMC rainfall and flood information is always available by monitoring their web page at *http://www.fcd.maricopa.gov/alert/alert.htm* - 24-hour flood and weather information for the entire state is available at *http://www.afws.org*
FCDMC 1	Flood Control District of Maricopa County/ **Pager**	Skunk Creek Message 1 **Weather Alert** (begin time/ end time)	➢ Flash flooding is possible in north-central Maricopa County, especially in the upper Skunk Creek and Cline Creek areas. ➢ Be alert!	
FCDMC 2	Flood Control District of Maricopa County/ **Pager**	Skunk Creek Message 2 **Flash Flood Alert** (begin time/ end time)	➢ Heavy rainfall detected in upper Skunk Creek or Cline Creek watersheds. ➢ Moderate flow volumes detected by stream gages. ➢ Potential for life-threatening flooding exists. ➢ Take necessary precautions!	➢ You MAY be instructed to EVACUATE and will need to do so at a moment`s notice. You may only have a few minutes! Get prepared! ➢ Monitor your FCDMC pager and NOAA weather radio continually for updates. ➢ Locate all the residents of your home, pets, and livestock. Collect absolute necessities and load in your vehicle(s). Include a flashlight. Secure the premises. ➢ Find a light-colored sheet or towel to hang on your doorway in case you evacuate.
NWS FFW	National Weather Service/ **NOAA Weather Radio** (tone alarm followed by voice message) **EAS Commercial radio and/or TV**	National Weather Service **Flash Flood Warning** (begin time/ end time)	➢ Flash flooding imminent or occurring in north-central Maricopa County, including Skunk Creek or Cline Creek. ➢ Take necessary precautions!	
FCDMC 3	Flood Control District of Maricopa County/ **Pager**	Skunk Creek Message 3 **Severe Flood Warning** (effective time/ all clear)	➢ Extreme rainfall detected in the upper Skunk Creek or Cline Creek watersheds. ➢ Critical flow volumes detected by stream gages. ➢ Severe flash flooding is imminent or occurring. ➢ Many or all roadway crossings in the area are impassable. ➢ Residents MUST monitor pagers and NOAA weather radios. ➢ Follow the instructions listed under "What You Need To Do"!	➢ IMMEDIATELY EVACUATE all residents and pets from your home and get to your evacuation site (see map on reverse). Act quickly! ➢ Turn off lights, heating and air conditioning units. ➢ Hang a light-colored sheet or towel over your door to indicate to emergency personnel that you have evacuated. ➢ Monitor your FCDMC pager and NOAA weather radio for updates. ➢ Follow the evacuation route shown on the map. Avoid travel on roadways through wash crossings. DO NOT cross any barricaded roadways! NEVER drive through flooded roadways, especially at night when dangers are harder to recognize. ➢ Report to evacuation site for registration, even if you do not plan to stay. ➢ Seek medical care at the nearest hospital, if needed. Food, clothing, and first aid may be available from emergency aid organizations such as the Red Cross.
FCDMC 4	Flood Control District of Maricopa County/ **Pager**	Skunk Creek Message 4 **All Clear** (effective time)	➢ Floods on Skunk Creek and Cline Creek have dropped below critical levels. ➢ Potential for additional extreme flooding is minimal.	➢ Leave the evacuation site and return to your home using the same route in reverse. ➢ Use flashlights if necessary to examine buildings. Flammables may be inside. ➢ Electrical equipment should be dried and checked before being returned to service. ➢ Boil drinking water before using. Wells should be pumped out and water tested for purity before drinking. ➢ Throw out any fresh food that has come in contact with flood waters.

NOTE: The message progression may shortcut to FCDMC Message 3 or 4 at any point in the sequence as evolving flood conditions warrant. If a NWS Flash Flood Watch is in effect early in the day, the warning message sequence may shortcut to NWS Flash Flood Warning, as appropriate to changing weather conditions

Three evacuation sites are provided. The Desert Hill Drive group, including Hopwood Trust/ Harper/ Mathis/ Birdsell/Parks, reports to:

- Daisy Mountain Fire Department Station
  251 West Desert Hills Drive
  Phoenix, Arizona 85086
  (623) 465-7400 Administration
  (602) 673-0695 Pager

The Honda Bow Road, Cline Creek, and Zorrillo Drive groups, including Albert/ Eller/ Hines/ Funk/ McKeag/ Geraci/ Sartain/ Selleys/ Caldwell/ Parry, report to:

- Desert Valley Baptist Church
  42425 N. New River Road
  New River, AZ 85086
  (623) 465-9461

The Shangri La group are part of the Zorrillo Drive group, but are located on the west side of Skunk Creek. Access to New River Road via Shangri La Drive is cut-off at the dip crossing. Therefore, Shangri La residents are instructed to evacuate to:

- Shangri La Resort Main Office
  46834 N. Shangri La Lane
  New River, AZ 85027
  (623) 465-5959

The FCDMC and NWS will provide timely weather information and flood warning messages to residents to the best of their ability using currently available technology. Residents are advised that prediction of flash floods is complex and conditions can change very rapidly. Residents have a responsibility to do what they can to remain alert for changing flood conditions impacting their residences by using the pagers, weather radios,

commercial radios, television, and/or the Internet. They should also closely monitor local conditions around their residences. When rainfall increases rapidly or flood conditions worsen significantly, residents should follow the instructions provided on their menus even if they have not received pager or weather radio flood warning messages.

6.5.3 Post-Flood Actions

The Skunk Creek Flood Response Plan is intended to be added as an Appendix to the FCDMC Flood Emergency Response Manual and the MCDEM Emergency Operations Plan. Post-flood action protocols, as addressed in both the FCDMC and MCDEM documents, are incorporated by reference herein to the Skunk Creek Flood Response Plan Report, Technical Memorandum, and FRP menus. Post-flood actions include, but are not limited to, criteria for re-occupation of structures, an After-Action Report, relations with the news media, and government assistance for flood victims (both private and agencies). Refer to the FCDMC and MCDEM documents for further information.

6.6 FRP Follow-Up

This section of the FRP describes the training, exercises, and update requirements of the FRP. These requirements, as recommended in this section, should be reviewed annually to take into account future development, changes in land use, changes in population, advances in communication and sensing technology, and the organization of the identified agencies and community. Any changes to the FRP should be communicated to all participating agencies and residents in the warning area.

6.6.1 Training

Training, in this FRP, refers to the water resource agencies responsible for developing flood information, the emergency response agencies responsible for carrying out the action plans,

and the residents in the Skunk Creek floodway warning area responsible for carrying out their individualized emergency action plans.

For the water resource and emergency response agencies, training requirements will be met by participation in annual exercises described in Section 6.6.2. Specialized training may be required for MCSO, DMFD, and/or RMFD personnel to familiarize themselves with the structure of the FRP and to maintain proficiency with any activities unique to carrying out their responsibilities as outlined in the action plan. Listing the training requirements of each agency is beyond the scope of this FRP; however, the identification of the need for this training is not. It is recommended that each agency establish a means of ensuring that any extra training in response to flooding events is provided on a periodic basis and is documented.

The residents included in the Skunk Creek FRP warning area will receive the NOAA Weather Radios, pagers, and menus at a future public meeting. Instructions on the structure of the FRP, use of the equipment, interpretation of the warning messages, and the emergency response activities will be provided at that time.

6.6.2 Flood Exercises

The scope, temporal and spatial extent of flood exercises should be varied to develop and maintain competency in using the decision-making tools and information dissemination equipment, and to maintain interest and communications among the agencies and residents. The agencies that should be represented are those listed in Table 6-5. In addition, representatives from the evacuation sites should also be involved.

- The spatial extent of the exercises should be varied. Flash flood exercises can be conducted on a basin-specific basis or as part of a countywide exercise. The FRP

should be exercised annually on a basin-specific basis and every three years as part of a countywide flood exercise.

- The exercises should vary temporally. The exercise can be held in alternating years during November or December to test the robustness of the FRP for winter storm flooding and during May or June to test the FRP for monsoon thunderstorm flooding.

- The scope of the exercises may vary. A tabletop exercise with all participating agencies in one possible format. Alternatively, a pre-determined exercise could be prepared by the FCDMC and conducted without prior sharing with the participating agencies.

- Residents should receive mailers from the District in advance of summer monsoon season and/or as part of NWS Flash Flood Awareness Week. Local newspapers could include FCDMC press releases about the Skunk Creek FWS in conjunction with the mailers.

6.6.3 FRP Updates

The FRP should be updated annually for changes in procedure and coverage due to communications upgrades, MSP/NWS forecast enhancements, changes in the flood detection network, changes in agency responsibilities, and/or population changes. The update should be conducted annually during April and May to insure necessary changes to the FRP are able to be made before the active summer monsoon season. All FRP updates should be mailed out to agencies and individuals that participate in the FWS.

The following verification activities should be conducted:

- The National Weather Service and District MSP should verify available products.

- Radio frequencies, group pager, telephone, and fax numbers should be tested to see if changes have been made since the last operational season. Agency contact numbers should be verified.

- All spotters should be called to verify their participation.

- The construction of the new Daisy Mountain Fire Department fire stations is scheduled for completion November 2001. Two new stations are being built at the following locations: north of Desert Hills Drive and 11th Avenue, and west of New River Road just south of the Cline Creek bridge crossing. The evacuation sites will move to these new facilities when they are completed. The Technical Memorandum, Field Book, and FRP menus will require revisions to show these new stations as the evacuation sites and to modify the evacuation routes accordingly.

- The condition of the evacuation routes should be verified periodically. This includes the evaluation of the hydraulic capacity of the Cline Creek bridge.

- Development within the downstream portions of the study area may change the flood warning needs as future development proceeds. Flood warning needs should be re-evaluated as development occurs.

6.7 Limitations

The limitations of the technical foundation of the FRP are those common to all hydrologic and hydraulic analyses. There are inaccuracies inherent in watershed modeling to estimate discharge values, and in step-backwater computer models to estimate water surface elevations. Engineering judgment is used in estimating various input parameters to these

models, such as loss parameters, routing variables, and roughness coefficients. Topographic mapping, though prepared to acceptable standards, also introduces error in measurements.

The operation of the FWS is predicated upon accurate measurement of rainfall and stream flow by the gages comprising the flood detection network. Known inaccuracies are introduced in measurements of rain by the gages due to uncontrollable variables such as wind speed and direction. Similarly, measurement of stage at stream gages for the purpose of discharge estimation can be inaccurate due to irregularities in the channel section that render the development of accurate rating curves for the cross sections difficult. The variability of precipitation further complicates the estimation of accurate modeling results.

All of the above combine to produce results that are approximately correct, but exactly inaccurate. The users of this FRP should keep these known limitations in mind.

SECTION 7: REFERENCES

1. Arizona Department of Transportation, Highway Drainage Manual – Hydrology, March 1993.

2. Flood Control District of Maricopa County, Drainage Design Manual for Maricopa County, Arizona, Volume I: Hydrology, June 1992.

3. Flood Control District of Maricopa County, Drainage Design Manual for Maricopa County, Arizona, Volume II: Hydraulics, September 1992.

4. Flood Control District of Maricopa County, Wickenburg Flood Response Plan and Technical Addendum, prepared by Stantec Consulting, Inc., Phoenix, Arizona, March 1999.

5. Maricopa County Department of Emergency Management, Maricopa County Emergency Operations Plan, February 1999.

6. Michael Baker, Jr., Inc., Rodger Creek Floodplain Delineation Study, December 1989, for the Flood Control District of Maricopa County, FCD 89-15. Revised by the Flood Control District of Maricopa County in February 1996.

7. Michael Baker, Jr., Inc., Cline Creek Floodplain Delineation Study, December 1989, for the Flood Control District of Maricopa County, FCD 89-15. Revised by the Flood Control District of Maricopa County in February 1996.

8. Montgomery Watson Americas, Inc., Skunk Creek Floodplain Delineation Study, June 1997, for the Flood Control District of Maricopa County, FCD 95-16. .

9. Tetra Tech, Inc., Skunk Creek Watercourse Master Plan, July 2001, for the Flood Control District of Maricopa County, FCD 99-23.

10. U.S. Department of the Interior, Bureau of Reclamation, 1988, Downstream Hazard Classification Guidelines, Acer Technical Memorandum No. 11, Denver, Colorado.

APPENDIX A

LISTING OF HOMEOWNERS INCLUDED IN THE FRP

APPENDIX B

DOWNSTREAM HAZARD CLASSIFICATION GUIDELINES (EXCERPT)

ACER TECHNICAL MEMORANDUM NO. 11
ASSISTANT COMMISSIONER - ENGINEERING AND RESEARCH
DENVER, COLORADO

DOWNSTREAM HAZARD CLASSIFICATION GUIDELINES

U.S. DEPARTMENT OF THE INTERIOR
Bureau of Reclamation
1988

IV. IDENTIFICATION OF HAZARDS

A. Introduction

A dam-break/inundation study is performed for the purpose of determining the impact of a dam failure flood on "possible hazards." A possible hazard is one that has been identified as having the possibility to constitute a hazard, but field work and/or analysis needs to be performed for confirmation.

Possible hazards are identified from topographic maps, photographs, field surveys, and information from "locals." They include any situation that is suspicious of having potential for lives-in-jeopardy or economic loss due to a dam failure. Some examples are listed in section II.

Sometimes, downstream hazard classification is obvious. That is, an analysis is not necessary because lives would be in jeopardy, and/or property damage would occur, with little doubt, due to a dam failure.

Analysis does not always prove a possible hazard to be a confirmed hazard; many "gray areas" exist in hazard classification. Analysis may indicate that a residence could be flooded by 1 foot (0.3 m) of water, but will this result in loss of life? If a failure flood overtops a highway bridge, will the bridge be destroyed? If not, will a vehicle be carried by floodwater or go out of control due to hydroplaning? Or, will a vehicle crash due to a damaged road or bridge after the flood has passed? Questions and gray areas such as these are the underlying reasons for guidelines regarding identification of downstream hazards. Such guidelines are presented in subsections B. through G.

Subsections B. through E. contain curves of depth versus velocity (figs. 2 through 6) that are indicative of dangerous floodflows for various possible hazards. Figure 2 is a modification by the author of a study performed by Black [8]. The curves in figures 3 through 6 were derived theoretically by the author. Figure 4 is in reasonable agreement with a theoretical analysis performed by Simons, Li and Associates [9]. The lower curve in figure 5 is in reasonable agreement with a theoretical analysis performed by David J. Love and Associates, Inc. [10], and a laboratory flume study performed at Colorado State University by Abt and Wittler using monoliths [11]. Very little research has been done on this topic; however, even if this were the case, there would be discrepancies which cannot be avoided due to the

many initial assumptions that have to be made, very large number of variables that have to be considered, and philosophy. This was emphasized by Abt and Wittler [11] who conclude, "Physical tests of human subjects, even in a controlled laboratory environment, indicated that the ability of the subject to adapt to flood flow conditions is difficult to quantify." The relationships presented in figures 2 through 6 are very reasonable for estimating lives-in-jeopardy for downstream hazard classification purposes, and satisfy one of the purposes of these guidelines - to bring consistency and objectivity into downstream hazard classification. In addition, they are logical and easy to use.

The depth-velocity flood danger level relationships are divided into three zones: low danger, judgment, and high danger. An explanation of these zones follows:

Low-danger zone. - If a [illegible] hazard is subject to a depth-velocity combination [illegible] one, then the number of lives-in-jeopardy a[illegible] downstream hazards is assumed to be zero.

High-danger zone. - If a possible hazard is subject to a depth-velocity combination plotting within this zone, then it is assumed that lives are in jeopardy at all possible downstream hazards.

Judgment zone. - The low-danger and high-danger zones represent the two extremes of reasonable certainty regarding the occurrence of no lives-in-jeopardy and some lives-in-jeopardy, respectively. Between these two extremes exists a zone of uncertainty with respect to assessing lives-in-jeopardy. Because every flood situation is unique, it is impossible to account for all of the variables that may result in lives to be in jeopardy if the flood magnitude (depth and velocity) plots in this zone. Thus, in this case, it is left up to the analyst to use engineering judgment for determining lives-in-jeopardy. Whenever possible, several opinions, and a common agreement among analysts should be reached in making this determination. There are many possible factors to consider; examples include:

- A designated campground, attraction, monument, etc. may receive very little visitor use. Such facilities may be visited for a very small total time during a year (e.g., 100 person-hours). Thus, the chance for lives to be in jeopardy due to flood depths and velocity combinations being in the judgment zone of

figure 5 or 6, is very small and lives-in-jeopardy can be considered zero.

- The total time that the flood depths and velocities reach magnitudes within the judgment zone. An example is a dam-break flood from a small reservoir that rapidly reaches a peak discharge, then rapidly decreases. If the only possible hazard is a highway receiving little use, then the chance of a vehicle being exposed to a dam-break flood is very small. On the other hand, vehicles on a heavily traveled highway that could receive flooding from a large reservoir having sustained high flows are likely to be "caught" in a flood situation. Although the effect of the flood on loss of life is uncertain in this zone, the fact that there is a large population involved cannot be ignored, and conservative judgment should be used such that loss of life is considered possible.

- A residence subject to a flood depth-velocity in the judgment zone may be a three-story, well-built, brick home. In such a case, the assumption could be made that the occupants are not in serious danger - especially if the flooding is of fairly short duration. However, occupants of a single-story, poorly constructed home subject to floods of a long duration should be assumed to be in danger.

- Multiple-story [illegible] occupants above the first [illegible] to [illegible] that the occupants will [illegible] (e.g., [illegible] sleeping) and will move to a h[illegible]

It is very important to understand that the zones (low-danger, judgment, high-danger) represented in figures 2 through 6 are not "cast in stone." Predicting lives-in-jeopardy is far from being an exact science. If the analyst has <u>sound reason</u> to believe that lives are in jeopardy for conditions in the low-danger zone, or no lives are in jeopardy for conditions in the high-danger zone, then such reasoning can override figures 2 through 6. However, the reasons have to be documented in the hazard classification report.

In many hazard classifications, especially where large dams and catastrophic flooding are involved, reference to figures 2 through 6 is superfluous because of the obvious flood danger. But, for situations where the hazard classification of a dam is solely dependent upon an

isolated flood situation where occupants of a dwelling or vehicle may be in danger, or a person having no protective environment (e.g. house, vehicle) may be in danger, these figures should be used. In such situations, the analyst will have predicted a reasonable maximum depth and velocity, "with confidence" (refer to the following paragraph), at the possible hazard site and needs to make a decision as to the floods effect on the possible hazard so that lives in jeopardy can be assessed. If depths and velocities cannot be predicted with confidence, then a conservative approach should be used that assumes any possible hazard in the path of a dam-break flood is in danger and is considered a downstream hazard. But, for situations where the analyst is confident about the predicted depths and velocities, figures 2 through 6 can be used for estimating the susceptibility of a possible hazard to impacts from the predicted floodwater[illegible] analysts can decide if the possible downstream hazard [illegible] as a downstream hazard, and assess lives in jeopardy[illegible]

The adequacy of predicted depths and velocities can be ascertained by performing sensitivity analyses on critical breach outflow and channel routing parameters. If predicted depths and velocities at a specific channel site do not change significantly with significant changes in the critical parameters, then the predicted depth and velocity can be used "with confidence." More information regarding sensitivity analysis is contained in appendix A, subsection D.

Extent of economic loss is the decision of the analyst, as previously stated. Thus, depth-velocity-damage relationship curves are not presented in the following sections.

B. Permanent Residences, Commercial and Public Buildings, and Worksite Areas

Permanent residences are considered dwellings attached to foundations, and hooked to utilities. Some mobile homes are not attached to foundations; these are discussed separately in subsection IV.C.

Worksite areas include facilities that contain workers on a daily (work week) basis. This includes farm operations, oil and gas operations, sand and gravel operations, and fish hatcheries.

The lives-in-jeopardy includes all occupants of dwellings located within the inundation boundaries, subject to a combination of flood depth and velocity plotting above the low-danger zone of figure 2. However, but

HIGH DANGER ZONE - Occupants of most houses are in danger from floodwater.

JUDGEMENT ZONE - Danger level is based upon engineering judgement.

LOW DANGER ZONE - Occupants of most houses are not seriously in danger from flood water.

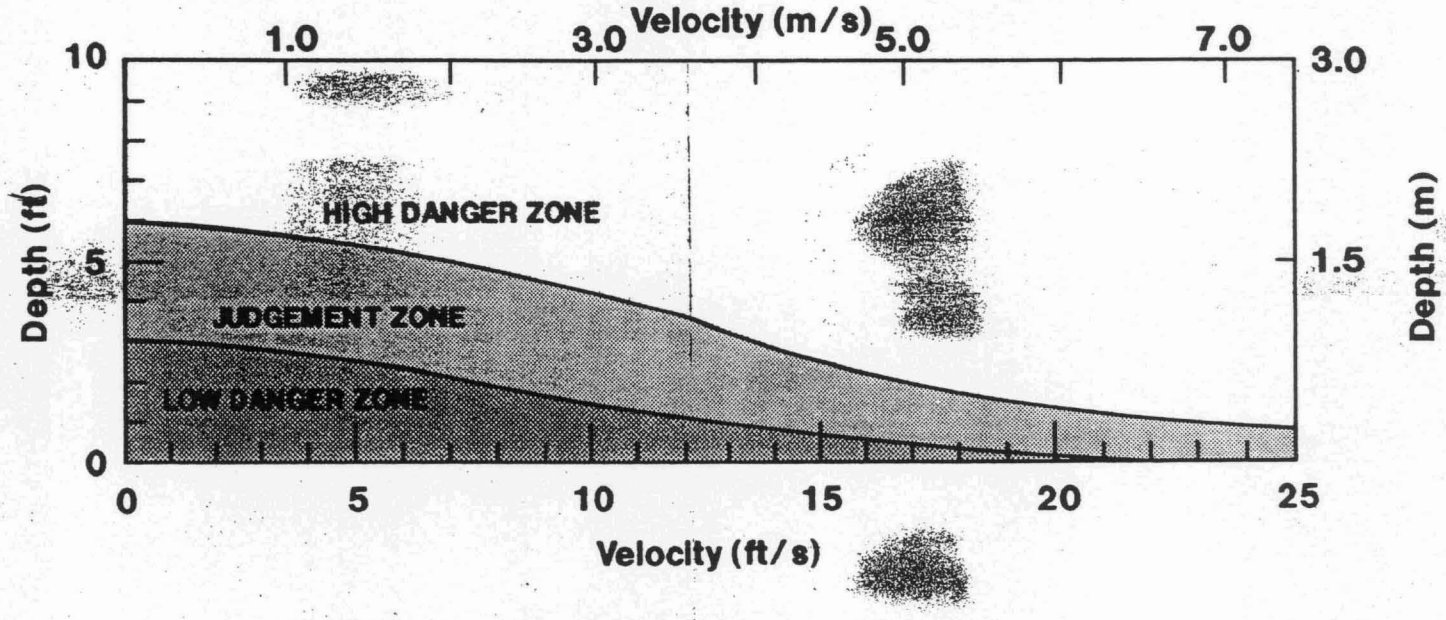


Figure 2. – Depth–velocity flood danger level relationship for houses built on foundations.

only if justifiable, no lives-in-jeopardy has to be associated with occupants of dwellings subject to a flood depth and velocity plotting within the judgment zone. Lives-in-jeopardy is always associated with occupants of dwellings subject to a combination of flood depth and velocity plotting within the high-danger zone except very special cases where the analyst can present strong justification.

If flood depth and velocity cannot be predicted with reasonable confidence, then the lives-in-jeopardy includes all occupants of residences within the inundation boundaries with no reference to depth or velocity, and the downstream hazard classification can be assigned accordingly.

For situations where pedestrians may be a factor in the downstream hazard classification, refer to subsection IV.E.

C. Mobile Homes

Mobile home parks are typical[illegible]d plains due to zoning requirements in ma[illegible] areas. T[illegible] dangerous situation for occupants of mobile homes, a[illegible] susceptible to movement from relatively small floods. Thus, depth-velocity-flood danger level relationships (fig. 3), other than those for houses on foundations, are used for mobile homes.

The lives-in-jeopardy includes all occupants of mobile homes located within the inundation boundaries, subject to a combination of flood depth and velocity plotting above the low-danger zone of figure 3. However, but only if, justifiable, no lives-in-jeopardy has to be associated with occupants of mobile homes subject to a combination of flood depth and velocity plotting within the judgment zone. Lives-in-jeopardy is always associated with occupants of mobile homes subject to a combination of flood depth and velocity plotting within the high-danger zone except very special cases where the analyst can present strong justification.

If flood depth and velocity cannot be predicted with reasonable confidence, then the lives-in-jeopardy includes all persons likely to be in the inundated area with no reference to depth and velocity, and the downstream hazard classification can be assigned accordingly.

HIGH DANGER ZONE - Occupants of almost any size mobile home are in danger from flood water.

JUDGEMENT ZONE - Danger level is based upon engineering judgement.

LOW DANGER ZONE - Occupants of almost any size mobile home are not seriously in danger from flood water.

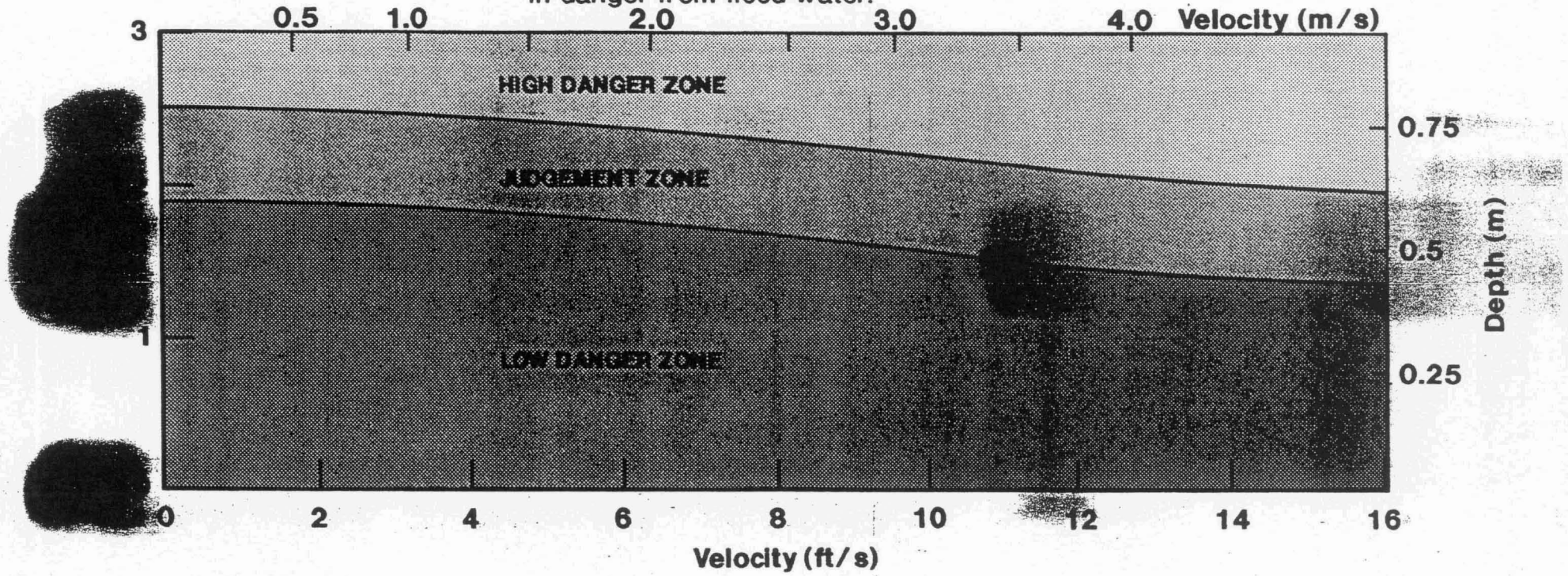


Figure 3. - Depth-velocity flood danger level relationship for mobile homes.

D. Roadways

If a dam-break flood wave inundates a roadway, the possibility for loss of life to motorists and pedestrians (guidance for pedestrians is covered in subsec. IV.E.) should be evaluated. In most cases, a roadway is inundated due to its crossing the channel via a bridge or culvert, or due to its running parallel to the channel such as in a canyon.

Loss of life is possible on a roadway as a result of a dam failure due to several causes. These include:

- A vehicle being carried downstream by floodwater,
- Loss of control and subsequent crash of a vehicle due to its impact with the floodwater, and,
- A vehicle crash resulting from road damage after the flood has passed.

However, because downstream hazard classification is based on the direct impacts from a dam-break flood (subsec. I.A.), situations such as a vehicle crash resulting from road damage after the flood wave has passed are not considered when estimating lives-in-jeopardy. It is assumed that vehicles are already on, or attempting to enter a roadway when it is inundated.

The lives-in-jeopardy includes all occupants of vehicles within the inundation boundaries subject to a combination of depth and velocity plotting above ~~the~~ low-danger [illegible] 4. However, but only if justifiable, no lives-in-jeopa[illegible]sociated with occupants of vehicles subject to a combina[illegible]pth and velocity plotting within the judgment zone. L[illegible] is always associated with occupants of vehicles subject to a combination of flood depth and velocity plotting within the high-danger zone except very special cases where the analyst can present strong justification.

If flood depth and velocity cannot be predicted with reasonable confidence, then the number of lives-in-jeopardy includes all persons likely to be in the inundated area with no reference to depth and velocity and the downstream hazard classification can be assigned accordingly.

A roadway will be a factor in determining the downstream hazard classification of a dam, only when it is paved. This criteria provides a simplified way of accounting for the amount, frequency, and speed of traffic on that particular roadway.

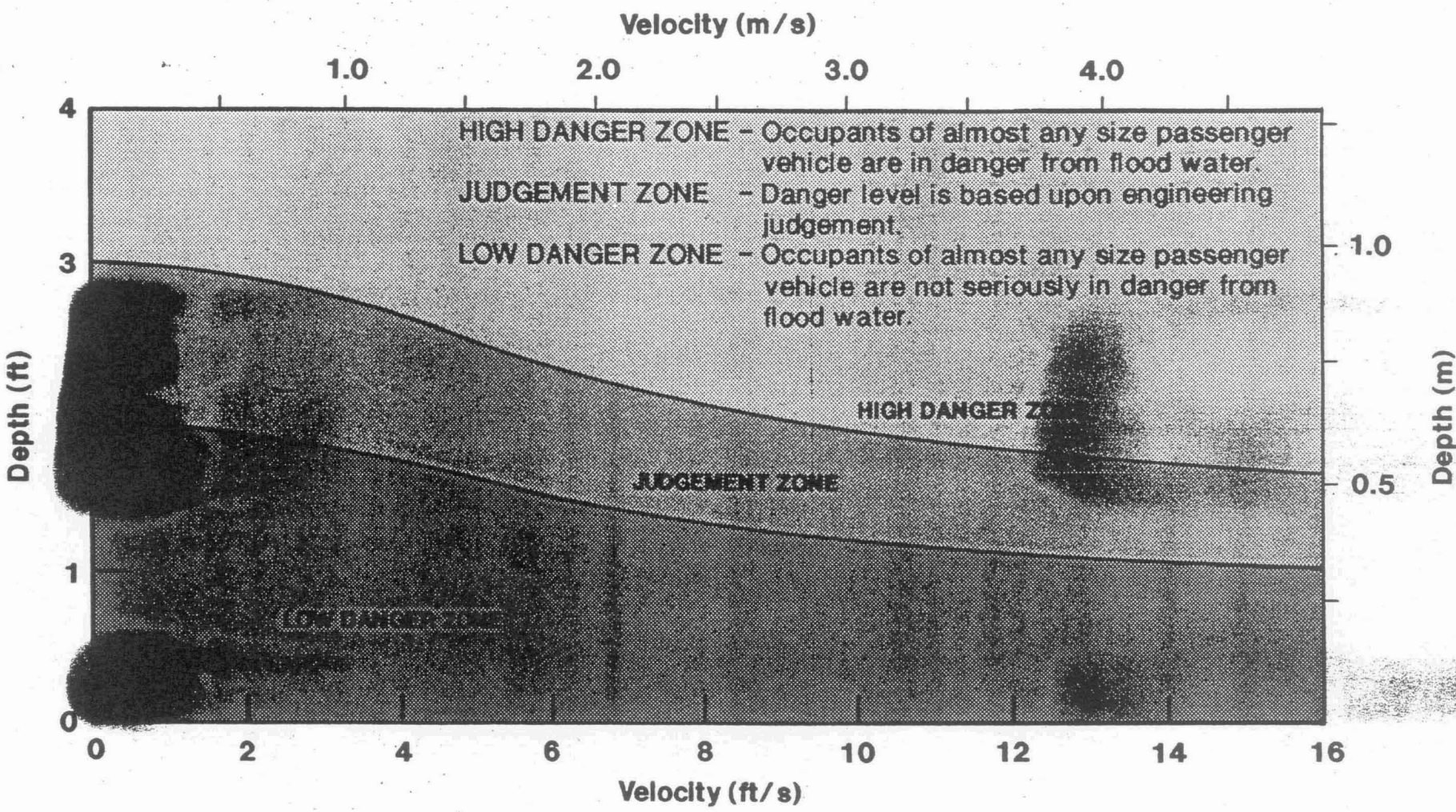


Figure 4. – Depth–velocity flood danger level relationship for passenger vehicles.

The paved road criteria apply unless the analyst can provide reason to the contrary. For example, a paved roadway may be located in a very remote location and rarely traveled. Or a roadway may be closed during the time of year that the dam failure is assumed to occur. Such a case is when a dam failure flood can only endanger a roadway if the failure occurs in combination with a large flood, but, the large flood can only occur in late spring (rain-on-snow flood) when a roadway located in an alpine area is closed.

Conversely, unpaved roads can also present a lives-in-jeopardy situation, thereby resulting in a significant- or high-hazard classification if proper justification can be made. An example is a gravel road in a long narrow canyon with a dam located upstream. This road receives moderate traffic because it is an access to an established recreational area, scenic attraction, residential housing division, etc. However, because the road passes through a long narrow canyon, a dam failure flood could very likely [illegible] loss of life to motorists in the canyon due to the difficulty [illegible] the flood.

Economic loss includes replacement costs of the highway and crossings only.

E. Pedestrian Routes

Pedestrian routes include sidewalks, bicycle paths, and walking/hiking trails. For situations where pedestrian routes are isolated, and/or may influence the hazard classification, the lives-in-jeopardy can be estimated using figures 5 and 6. Figures 5 and 6 are depth-velocity-flood danger level relationships for adults and children, respectively. Separate figures for adults and children (versus one figure for all humans) are included so possible hazards that may not include children can be evaluated differently than mixed populations of both adults and children. Examples of "adult only" populations are worksites and adult-only residential areas. An adult is considered (for the use of figures 5 and 6) any human over 5 feet (150 cm) tall and weighing over 120 pounds (54 kg). The choice of using either figure 5 or 6 is the decision of the analyst based on knowledge and understanding of the population. However, when populations are mixed (i.e., adults and children), figure 6 should be used for conservativeness.

Infants are not treated separately; instead, they are assumed to be safely attended by adults.

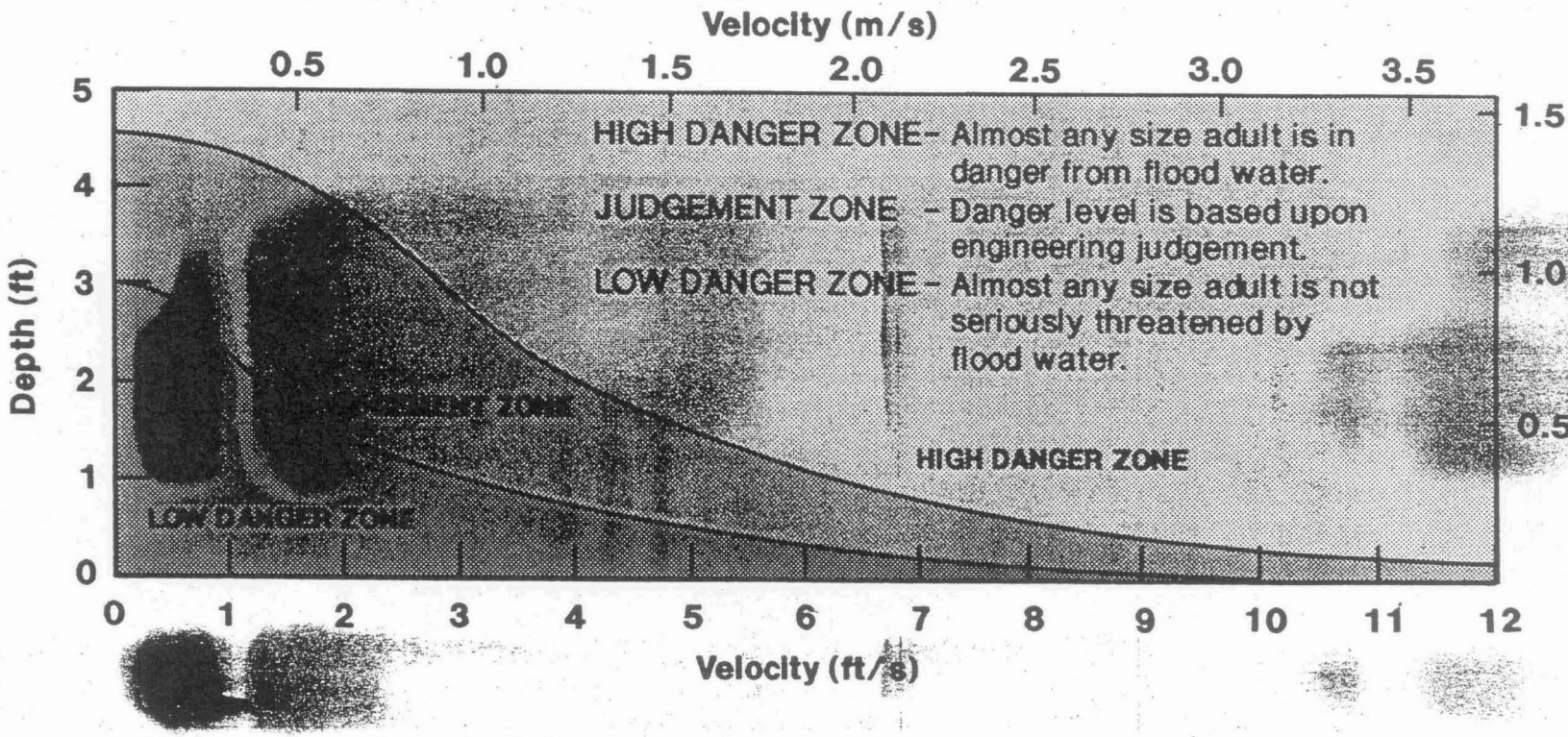


Figure 5. – Depth–velocity flood danger level relationship for adults.

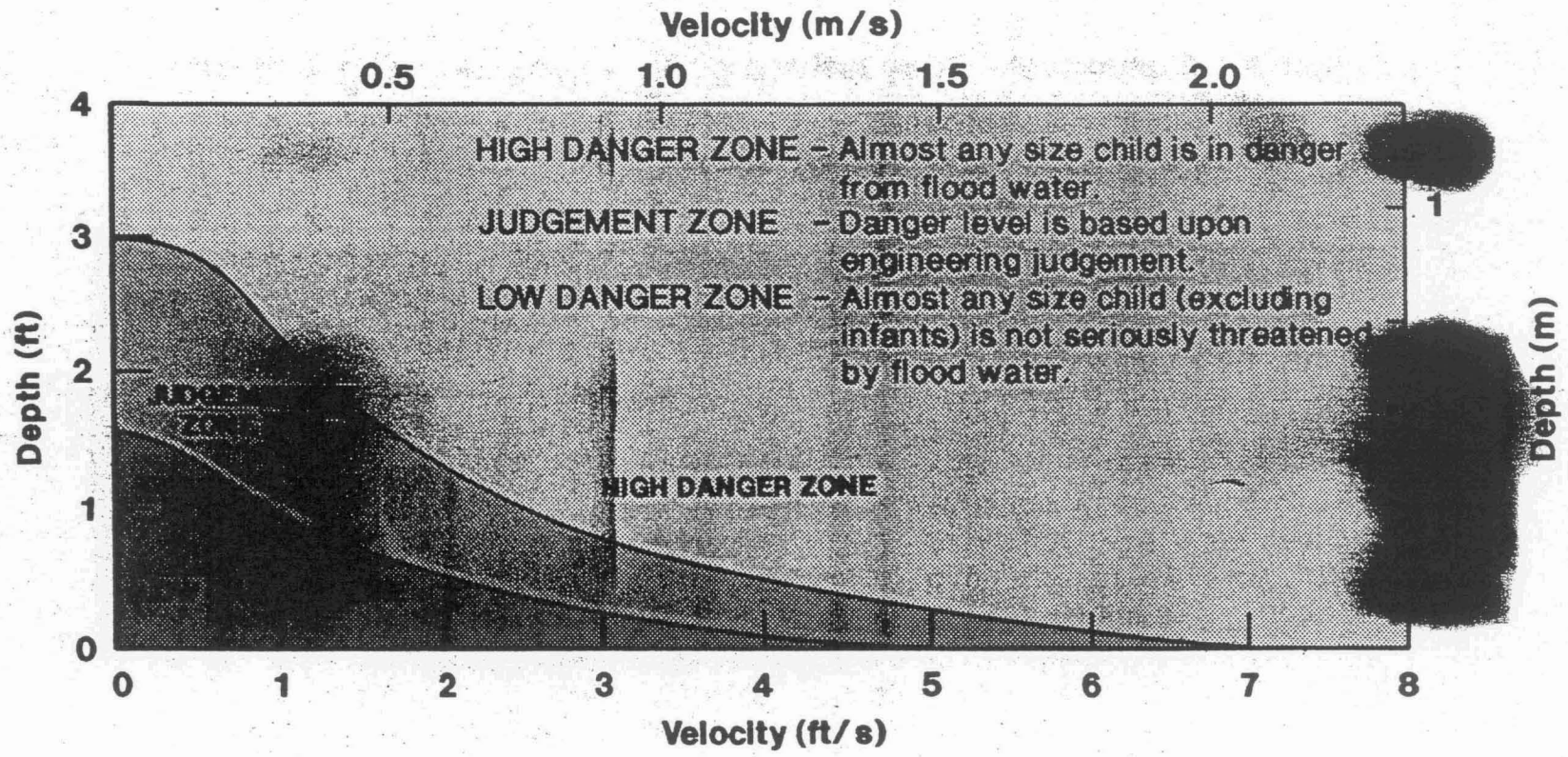


Figure 6. – Depth–velocity flood danger level relationship for children.

VI. REFERENCES

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Marsha Hilmes
Ft. Collins 970-224-6036

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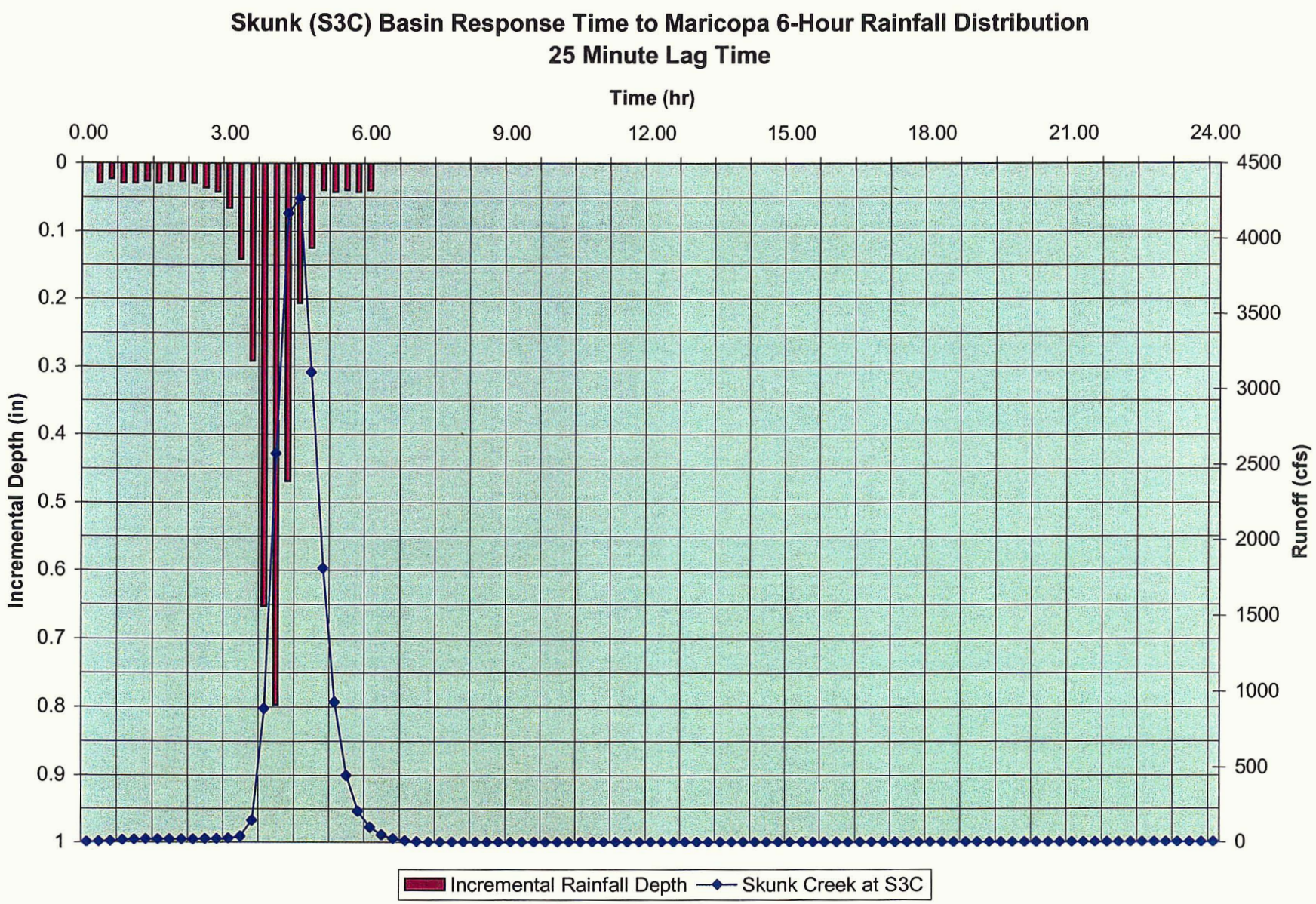
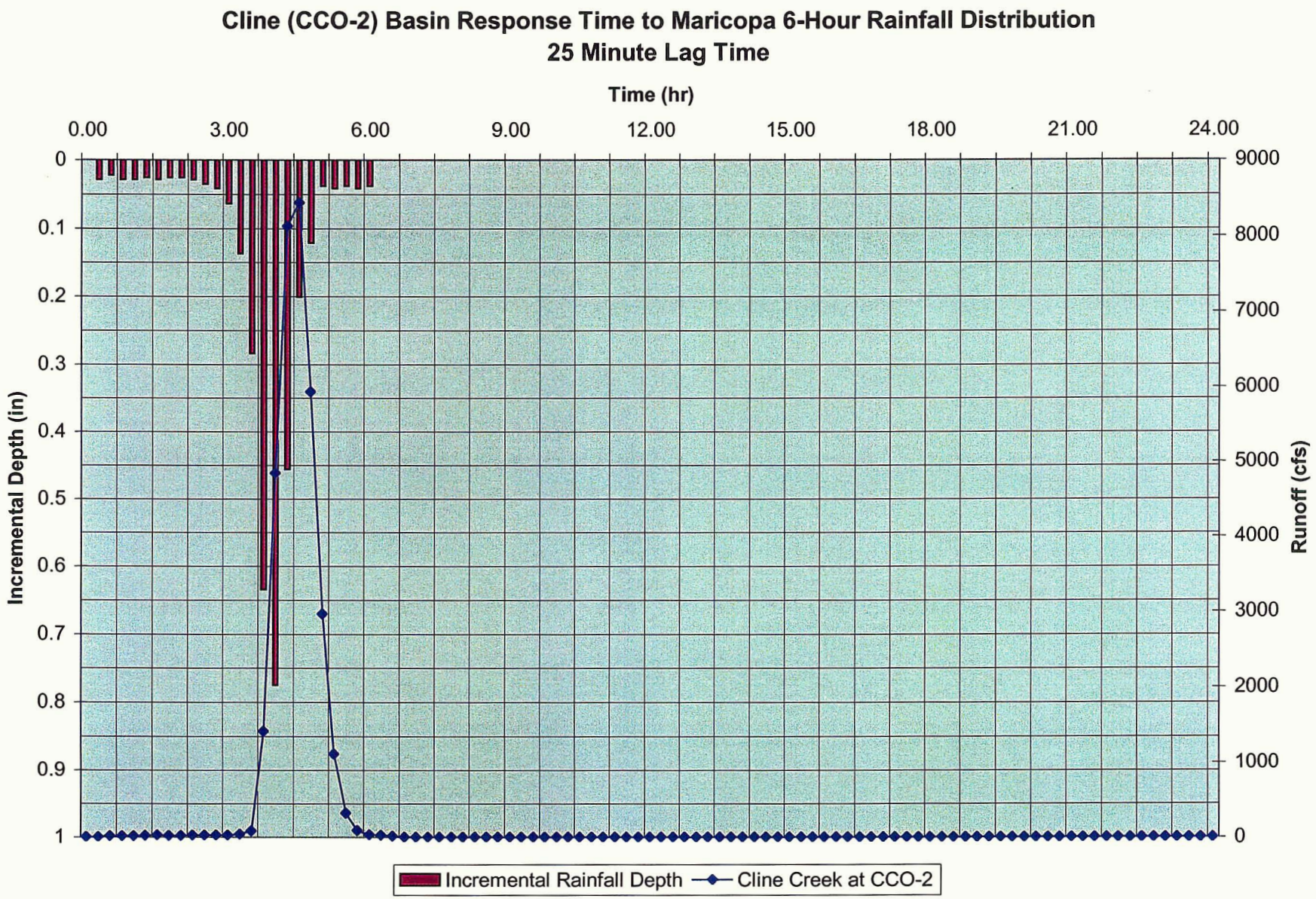
APPENDIX C

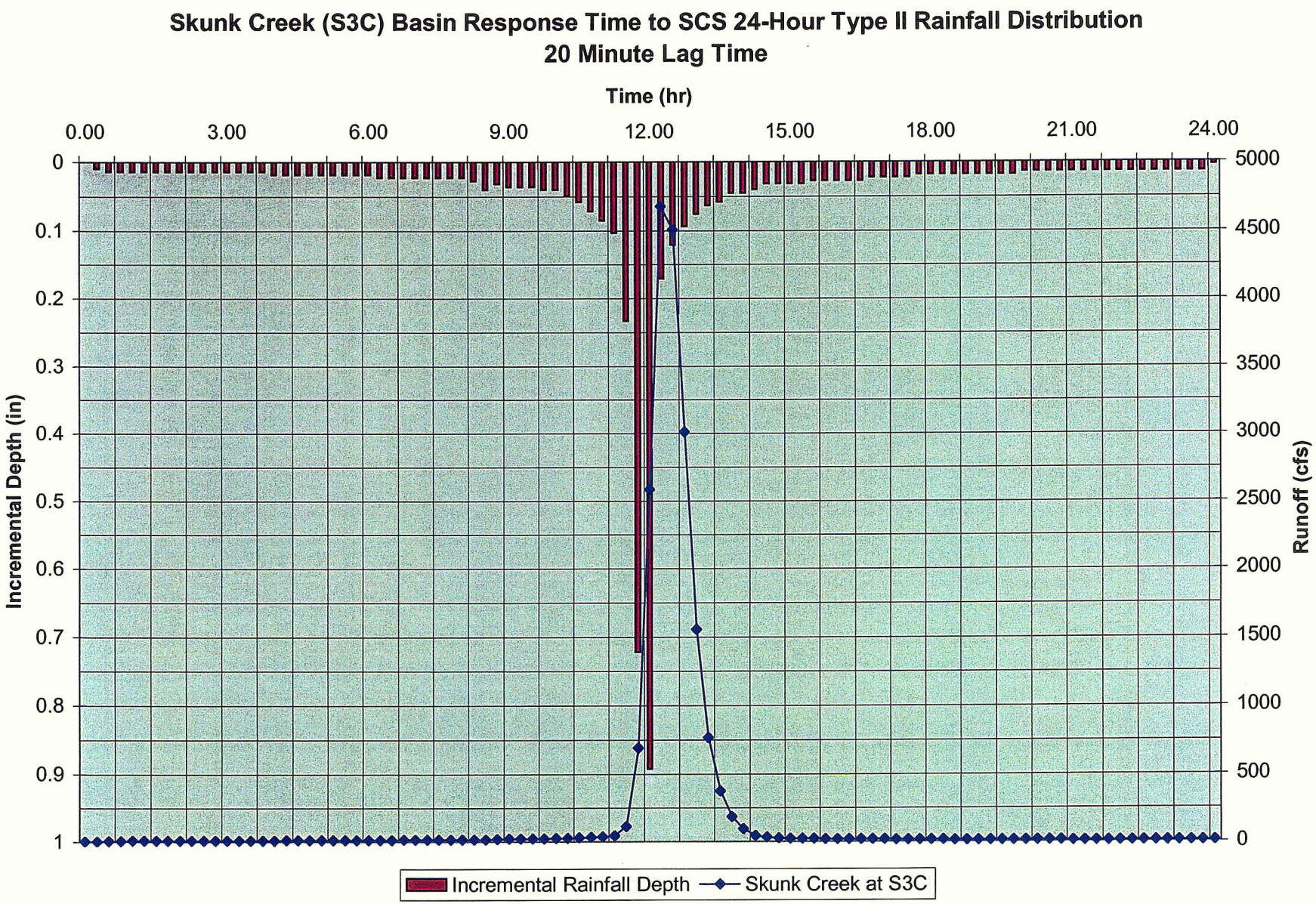
HYDROLOGIC ANALYSIS SUPPORTING DATA

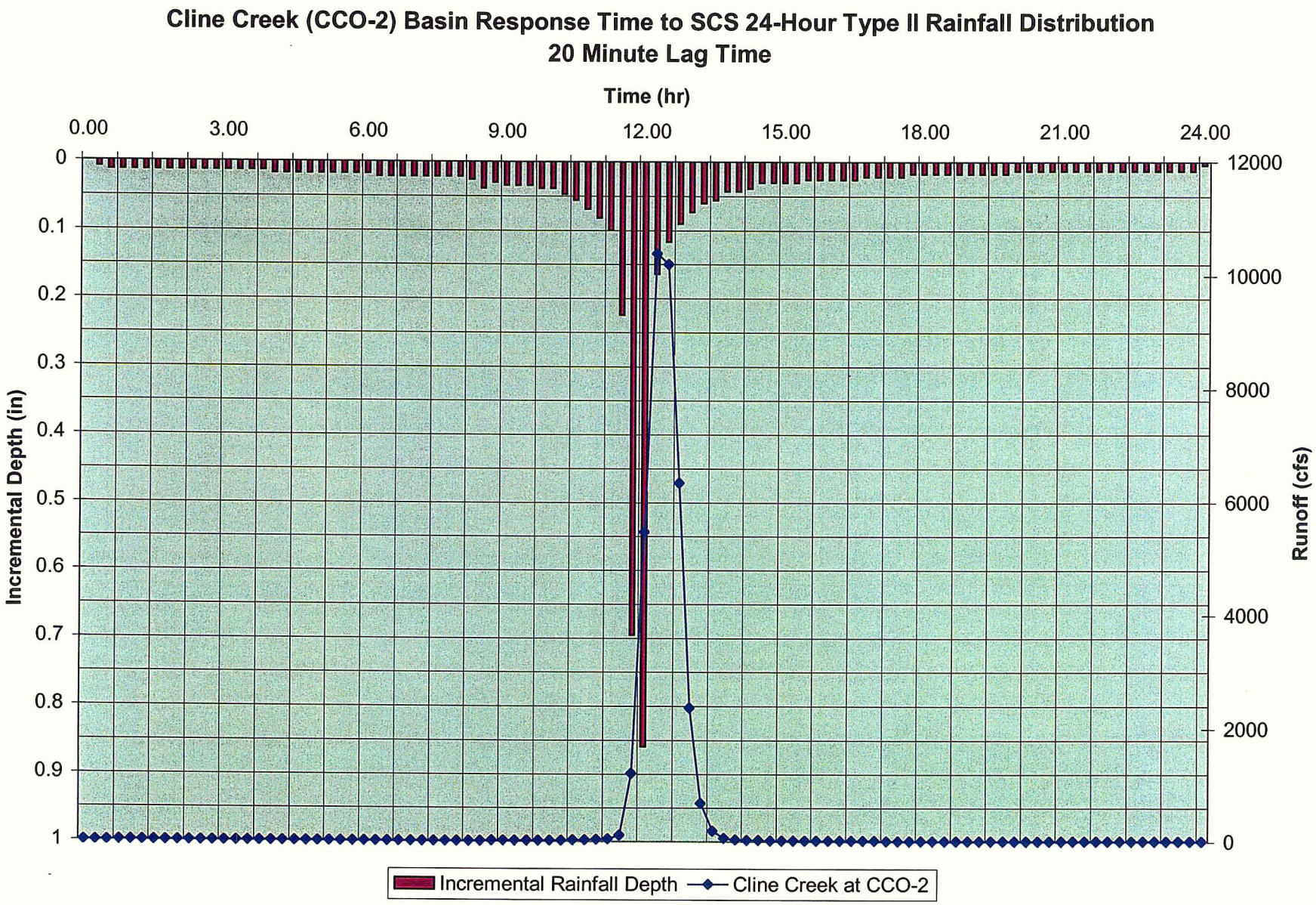
C-1: Rainfall Distribution & Basin Response Time Plots
C-2: Threshold Precipitation Depth Plots
C-3: Recurrence Interval Curves

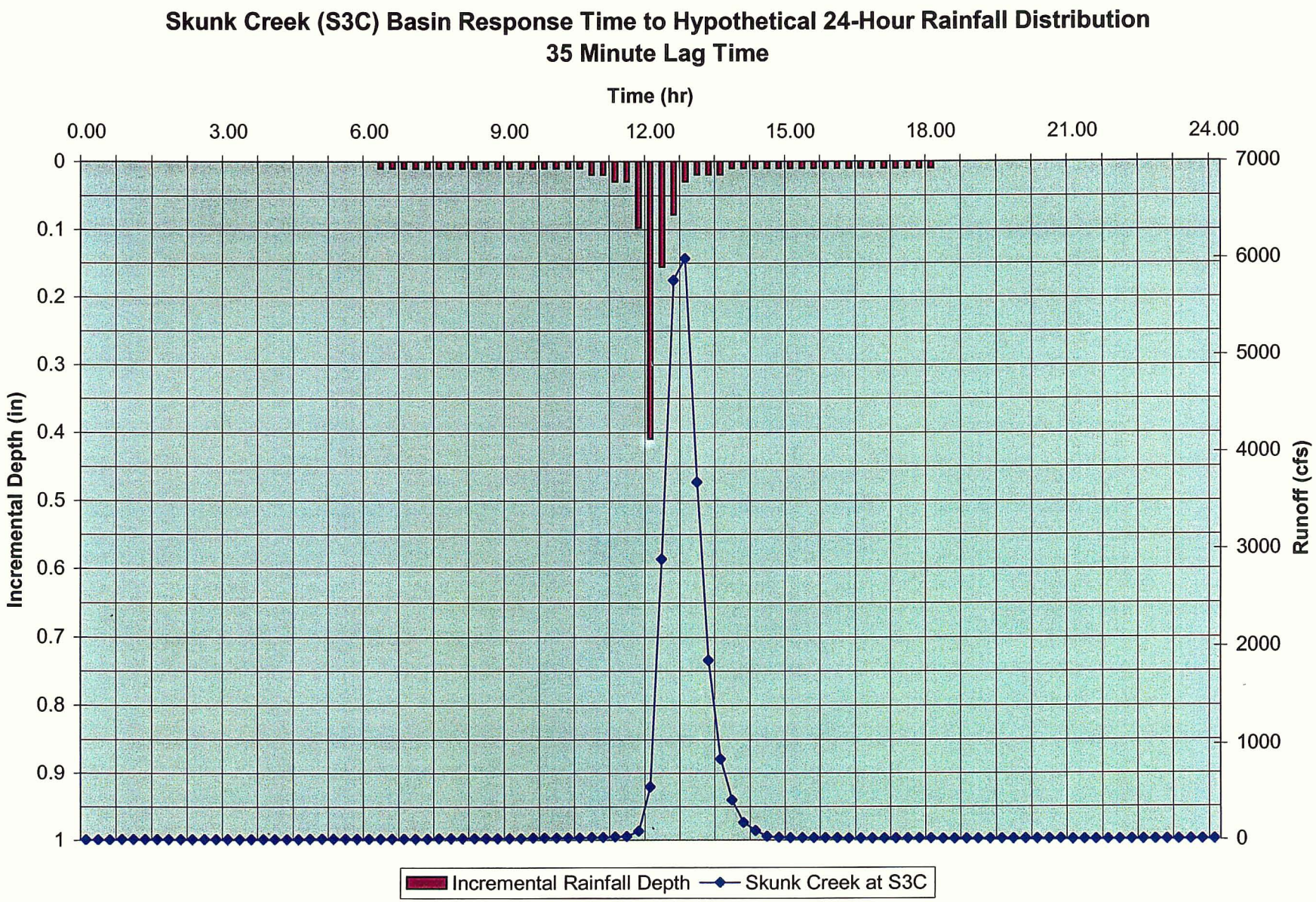
APPENDIX C-1: Rainfall Distribution & Basin Response Time Plots

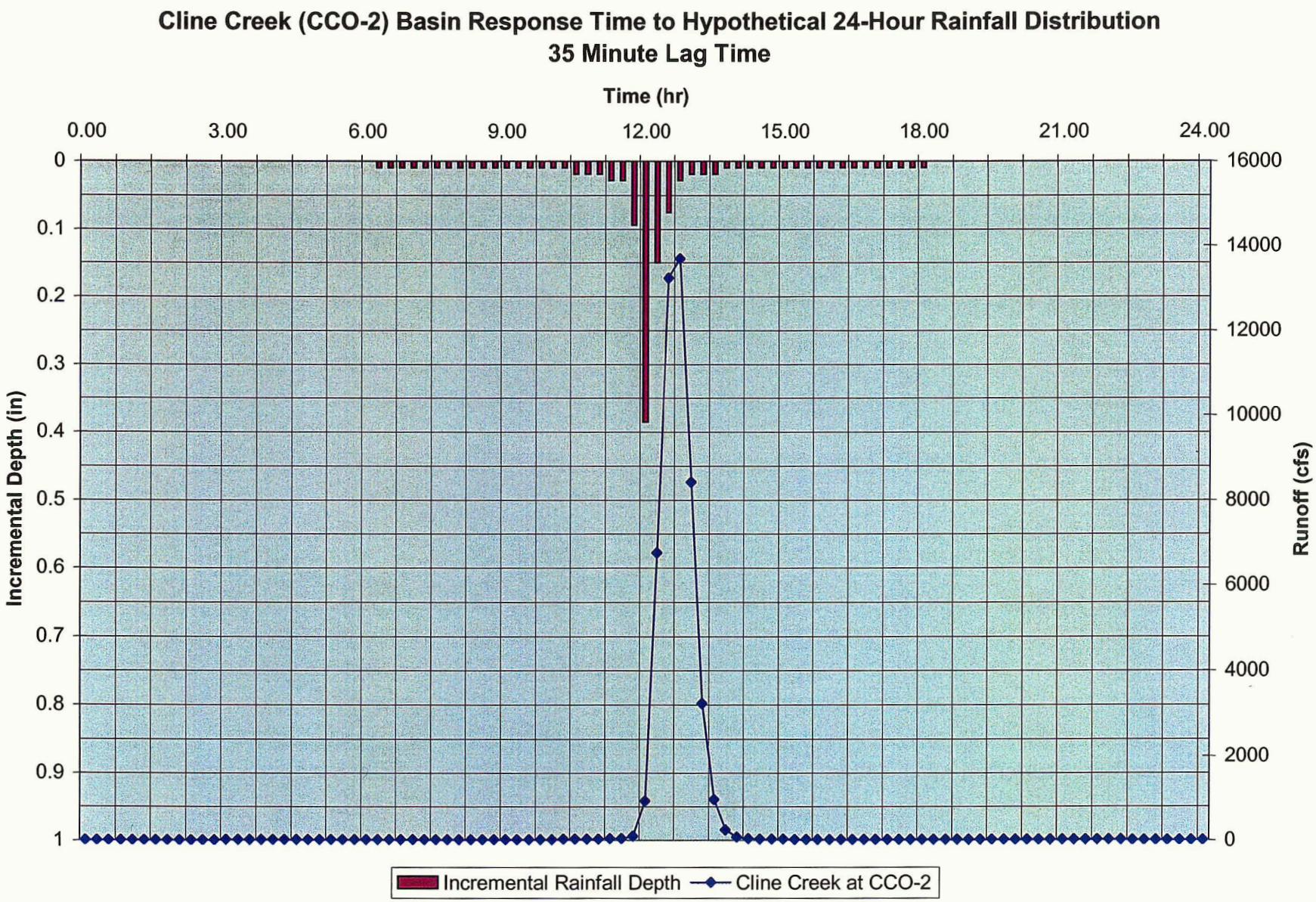

Skunk (S3C) Basin Response Time to Maricopa 6-Hour Rainfall Distribution
25 Minute Lag Time
Time (hr)
0.00
3.00
6.00
9.00
12.00
15.00
18.00
21.00
24.00
Incremental Depth (in)
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
Runoff (cfs)
4500
4000
3500
3000
2500
2000
1500
1000
500
0
Incremental Rainfall Depth
Skunk Creek at S3C

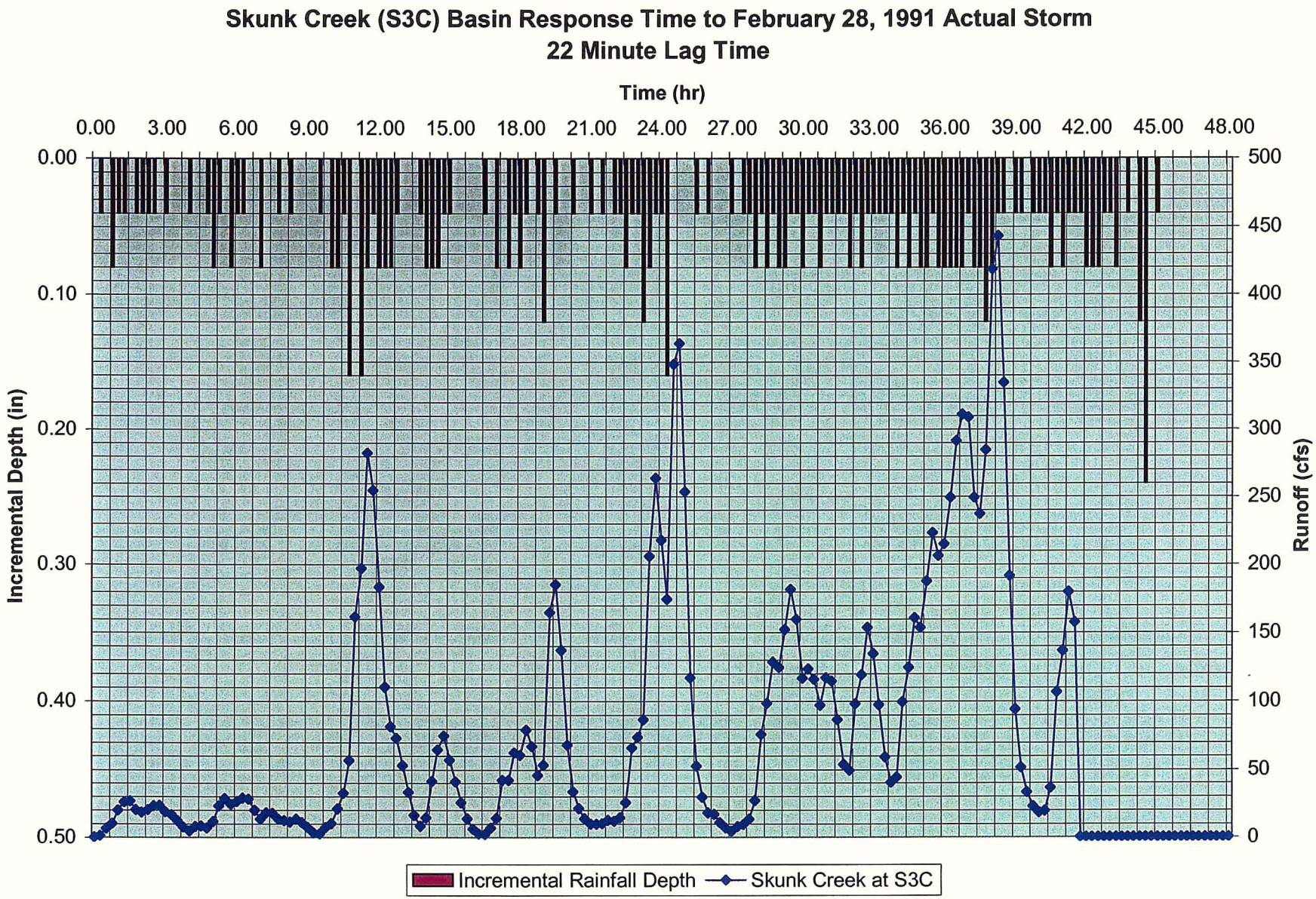

Cline (CCO-2) Basin Response Time to Maricopa 6-Hour Rainfall Distribution
25 Minute Lag Time
Time (hr)
0.00
3.00
6.00
9.00
12.00
15.00
18.00
21.00
24.00
Incremental Depth (in)
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
Runoff (cfs)
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
Incremental Rainfall Depth
Cline Creek at CCO-2

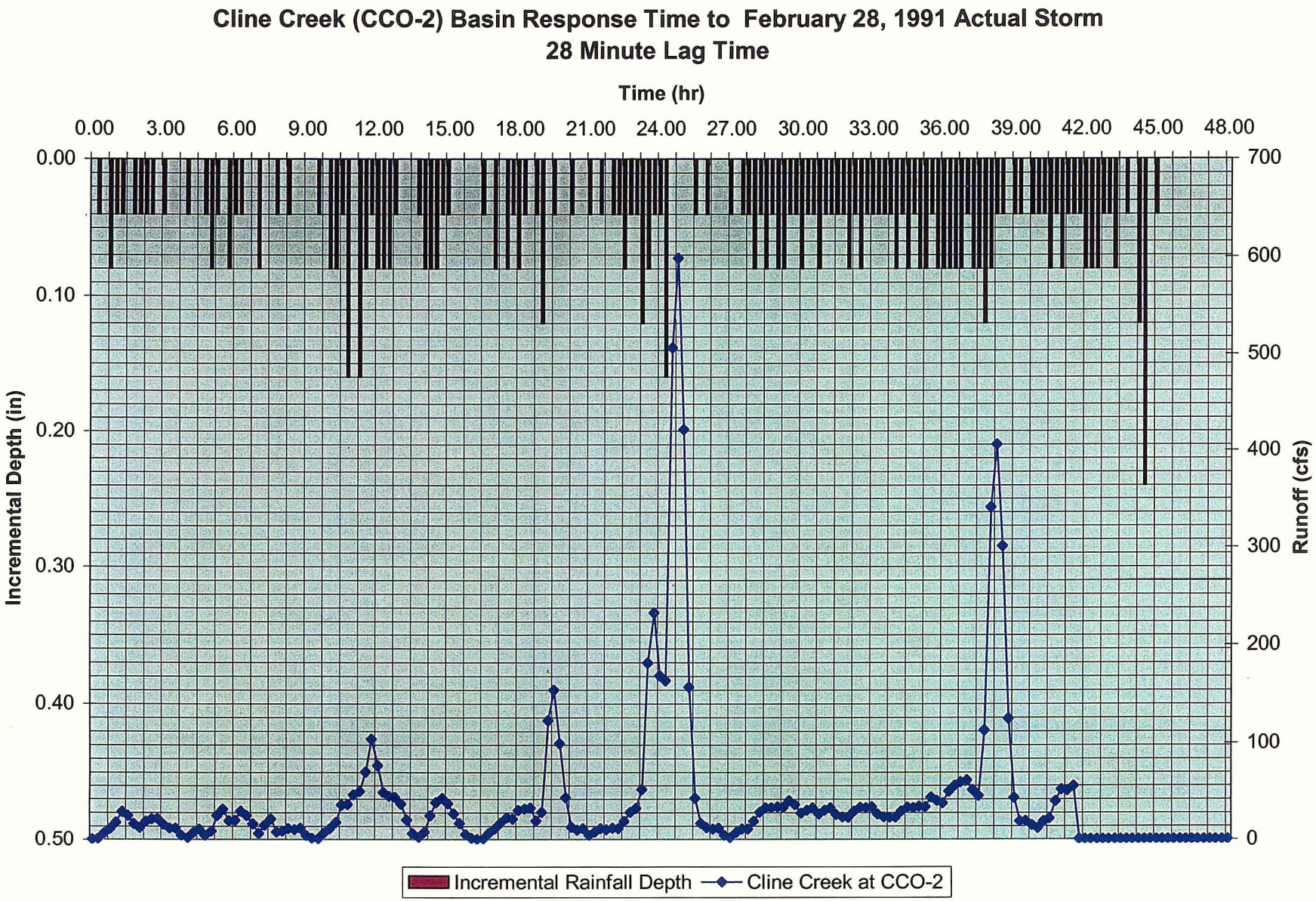

Skunk Creek (S3C) Basin Response Time to SCS 24-Hour Type II Rainfall Distribution
20 Minute Lag Time
Time (hr)
0.00
3.00
6.00
9.00
12.00
15.00
18.00
21.00
24.00
Incremental Depth (in)
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
Runoff (cfs)
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
Incremental Rainfall Depth
Skunk Creek at S3C

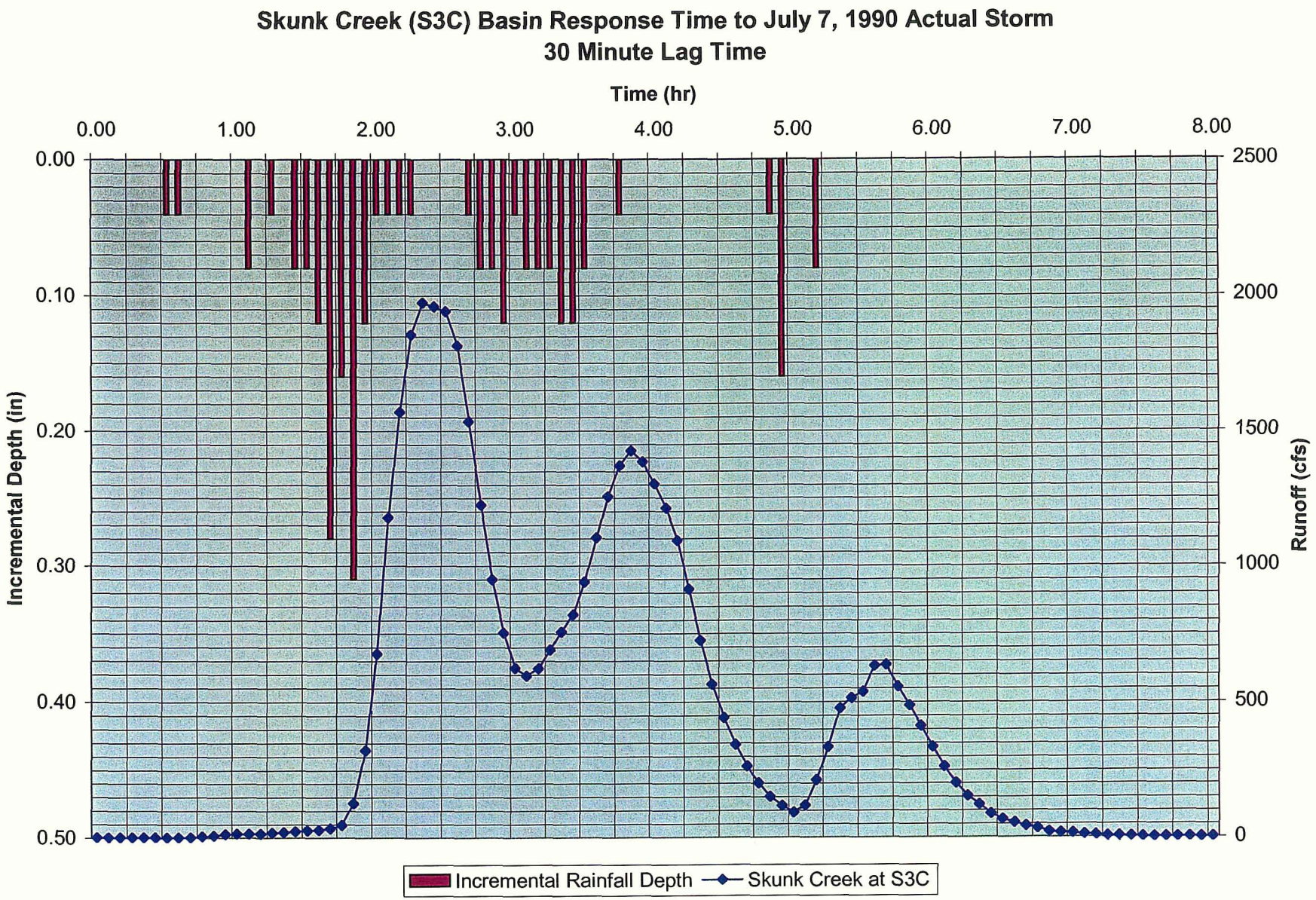

Cline Creek (CCO-2) Basin Response Time to SCS 24-Hour Type II Rainfall Distribution
20 Minute Lag Time
Time (hr)
0.00
3.00
6.00
9.00
12.00
15.00
18.00
21.00
24.00
Incremental Depth (in)
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
Runoff (cfs)
12000
10000
8000
6000
4000
2000
0
Incremental Rainfall Depth
Cline Creek at CCO-2

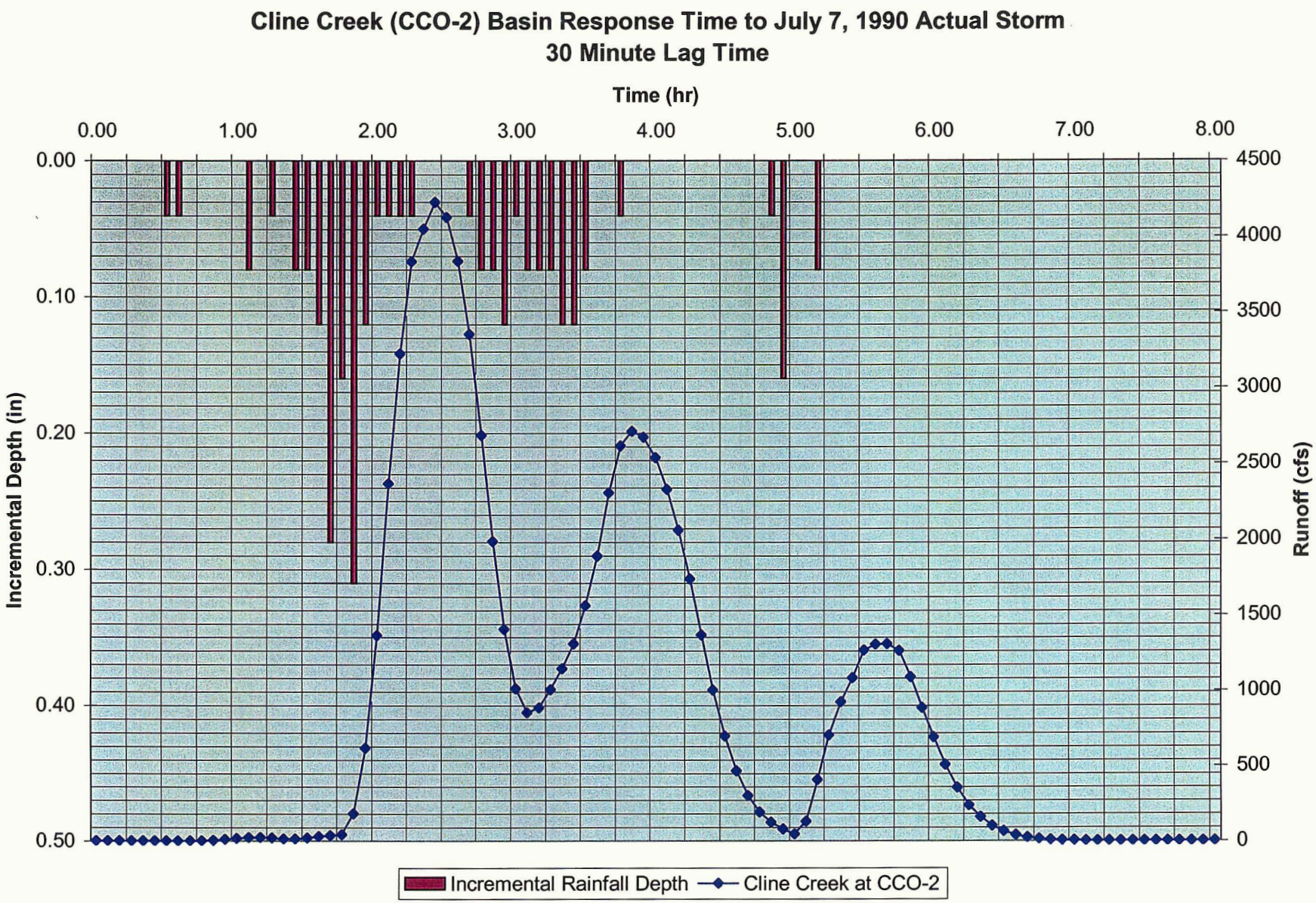

Skunk Creek (S3C) Basin Response Time to Hypothetical 24-Hour Rainfall Distribution
35 Minute Lag Time
Time (hr)
0.00
3.00
6.00
9.00
12.00
15.00
18.00
21.00
24.00
Incremental Depth (in)
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
Runoff (cfs)
7000
6000
5000
4000
3000
2000
1000
0
Incremental Rainfall Depth
Skunk Creek at S3C

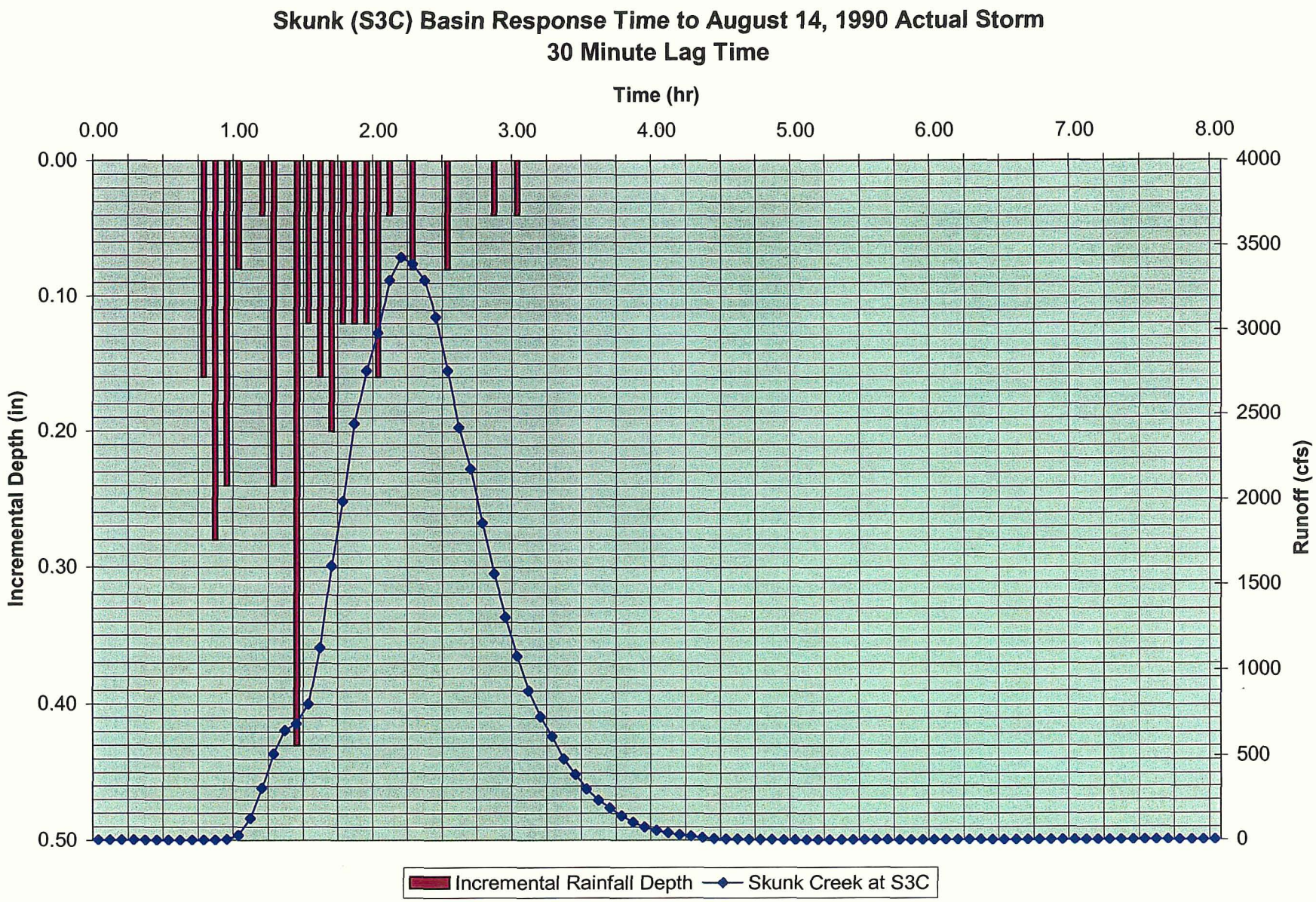

Cline Creek (CCO-2) Basin Response Time to Hypothetical 24-Hour Rainfall Distribution
35 Minute Lag Time
Time (hr)
0.00
3.00
6.00
9.00
12.00
15.00
18.00
21.00
24.00
Incremental Depth (in)
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
Runoff (cfs)
16000
14000
12000
10000
8000
6000
4000
2000
0
Incremental Rainfall Depth
Cline Creek at CCO-2

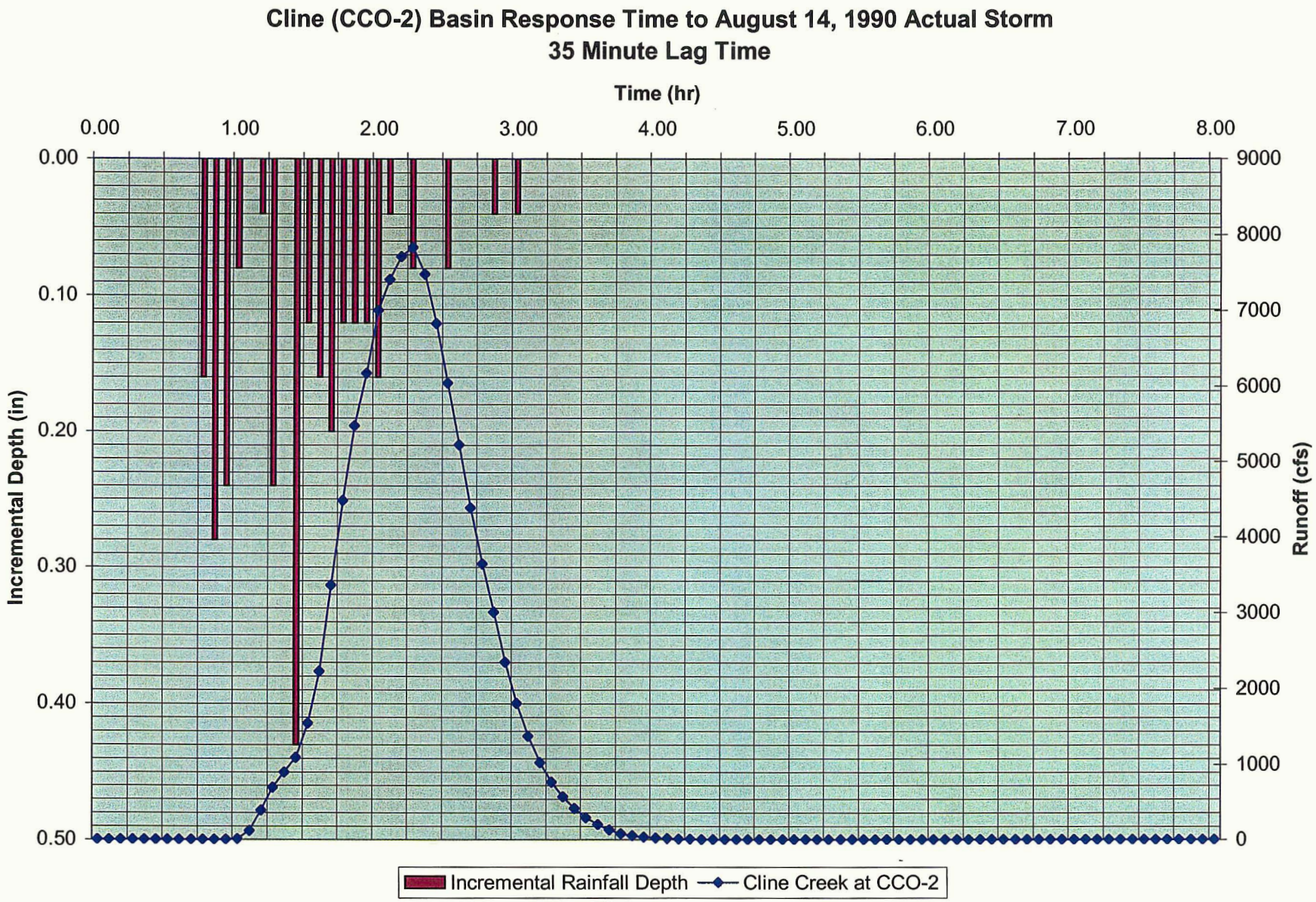

Skunk Creek (S3C) Basin Response Time to February 28, 1991 Actual Storm
22 Minute Lag Time
Time (hr)
0.00
3.00
6.00
9.00
12.00
15.00
18.00
21.00
24.00
27.00
30.00
33.00
36.00
39.00
42.00
45.00
48.00
Incremental Depth (in)
0.00
0.10
0.20
0.30
0.40
0.50
Runoff (cfs)
500
450
400
350
300
250
200
150
100
50
0
Incremental Rainfall Depth
Skunk Creek at S3C

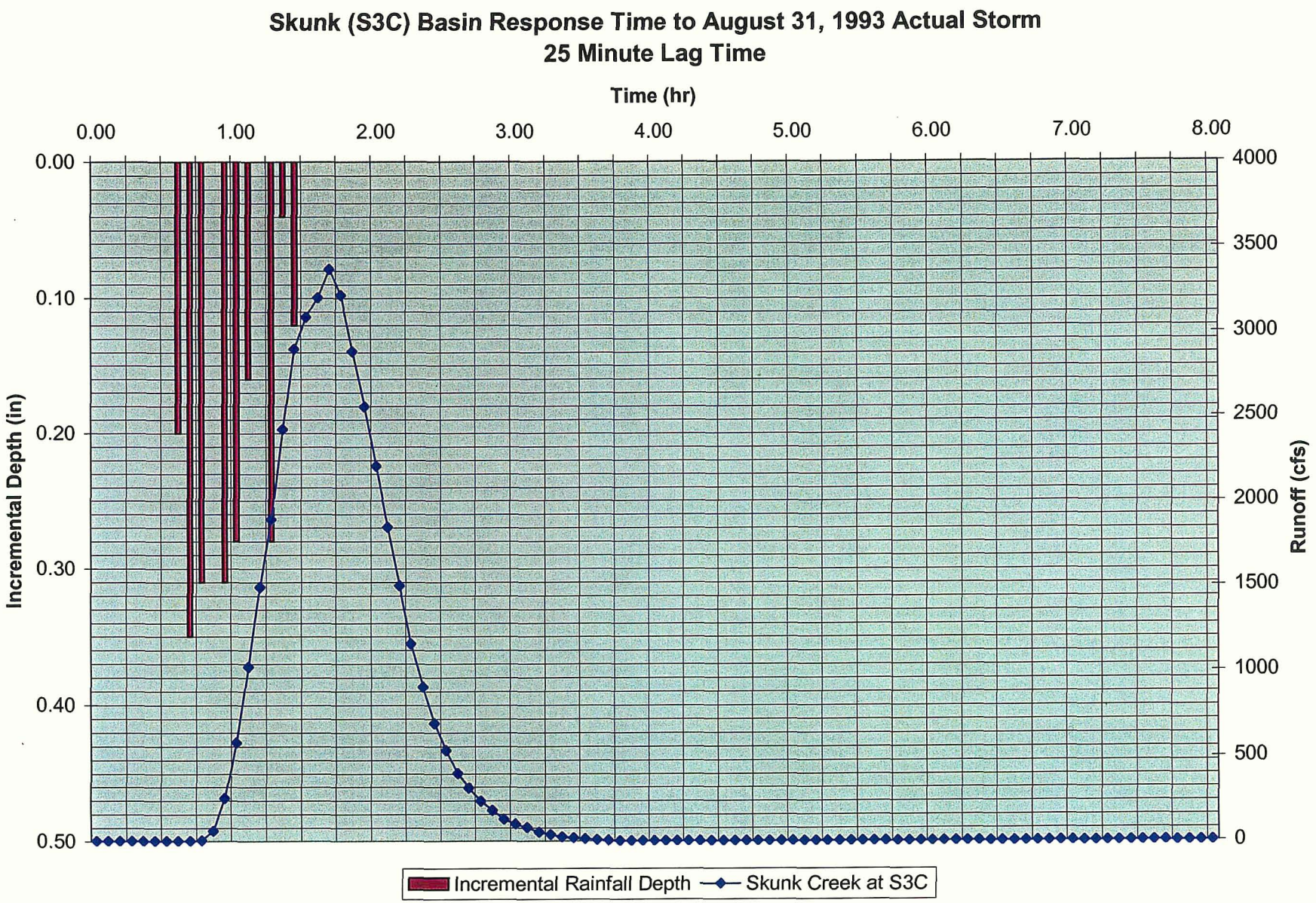

Cline Creek (CCO-2) Basin Response Time to February 28, 1991 Actual Storm
28 Minute Lag Time
Time (hr)
0.00
3.00
6.00
9.00
12.00
15.00
18.00
21.00
24.00
27.00
30.00
33.00
36.00
39.00
42.00
45.00
48.00
Incremental Depth (in)
0.00
0.10
0.20
0.30
0.40
0.50
Runoff (cfs)
700
600
500
400
300
200
100
0
Incremental Rainfall Depth
Cline Creek at CCO-2

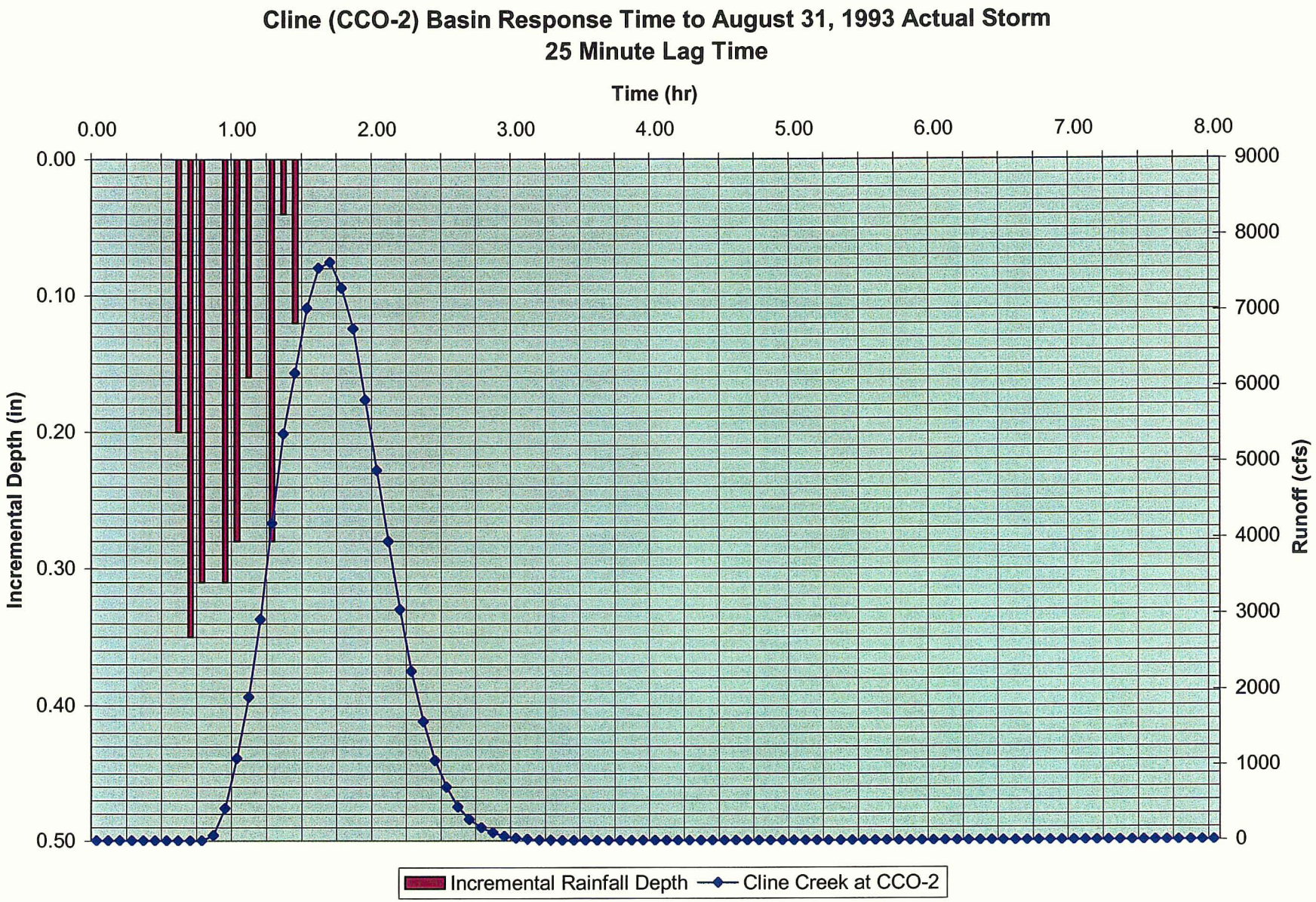

Skunk Creek (S3C) Basin Response Time to July 7, 1990 Actual Storm
30 Minute Lag Time
Time (hr)
0.00
1.00
2.00
3.00
4.00
5.00
6.00
7.00
8.00
Incremental Depth (in)
0.00
0.10
0.20
0.30
0.40
0.50
Runoff (cfs)
2500
2000
1500
1000
500
0
Incremental Rainfall Depth
Skunk Creek at S3C


Cline Creek (CCO-2) Basin Response Time to July 7, 1990 Actual Storm
30 Minute Lag Time
Time (hr)
0.00
1.00
2.00
3.00
4.00
5.00
6.00
7.00
8.00
Incremental Depth (in)
0.00
0.10
0.20
0.30
0.40
0.50
Runoff (cfs)
4500
4000
3500
3000
2500
2000
1500
1000
500
0
Incremental Rainfall Depth
Cline Creek at CCO-2

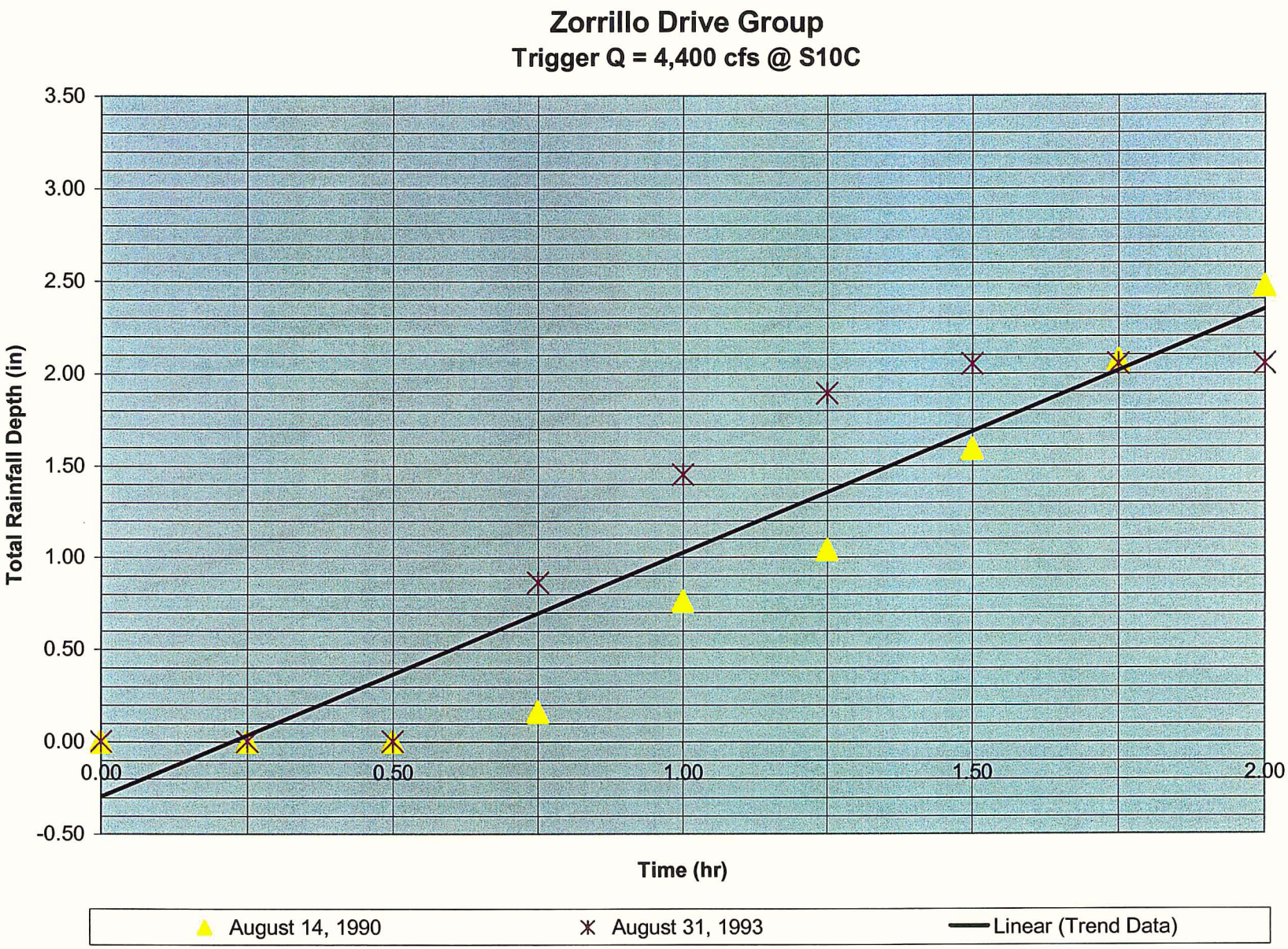

Skunk (S3C) Basin Response Time to August 14, 1990 Actual Storm
30 Minute Lag Time
Time (hr)
0.00
1.00
2.00
3.00
4.00
5.00
6.00
7.00
8.00
Incremental Depth (in)
0.00
0.10
0.20
0.30
0.40
0.50
Runoff (cfs)
4000
3500
3000
2500
2000
1500
1000
500
0
Incremental Rainfall Depth
Skunk Creek at S3C

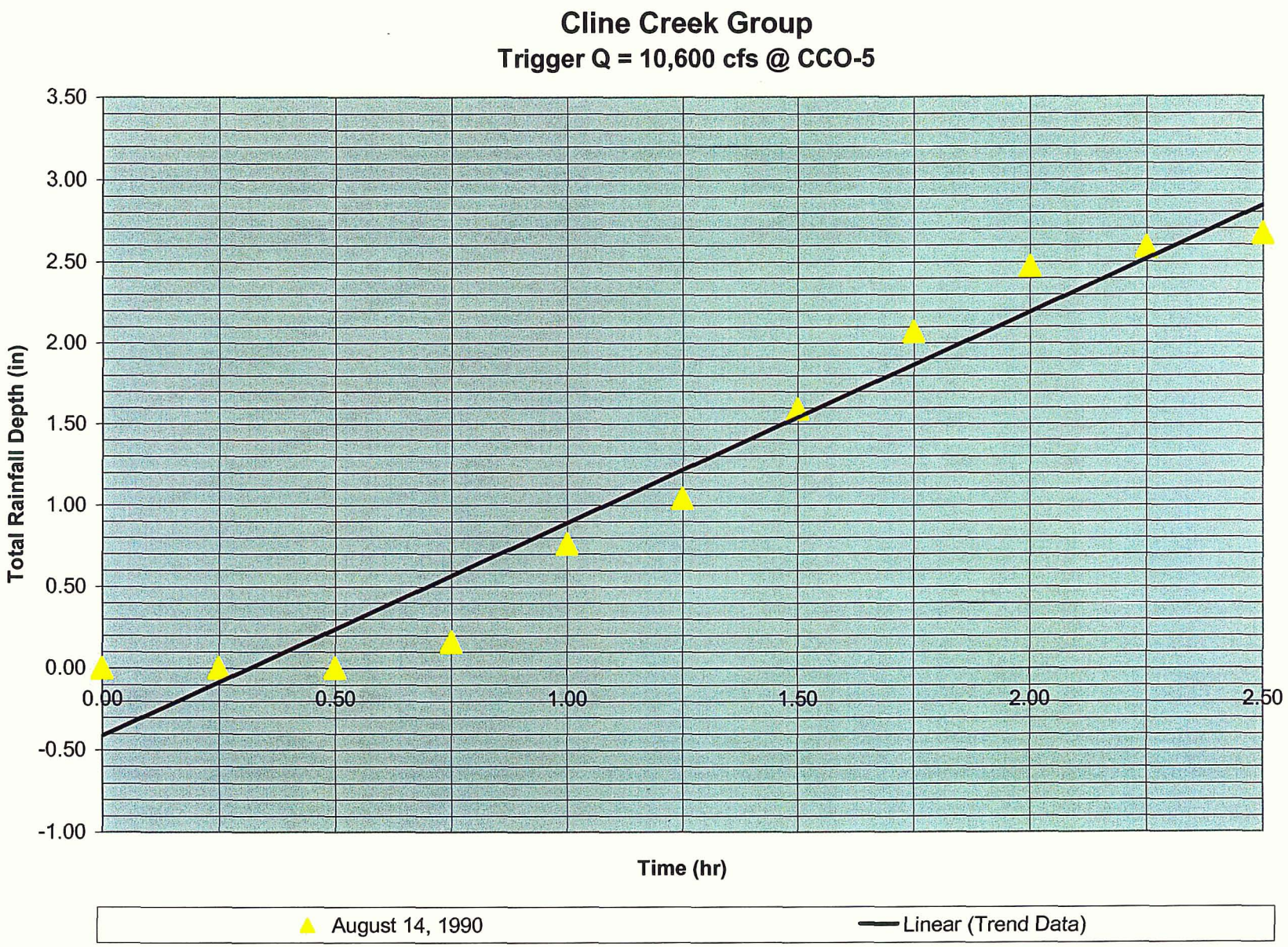

Cline (CCO-2) Basin Response Time to August 14, 1990 Actual Storm
35 Minute Lag Time
Time (hr)
0.00
1.00
2.00
3.00
4.00
5.00
6.00
7.00
8.00
Incremental Depth (in)
0.00
0.10
0.20
0.30
0.40
0.50
Runoff (cfs)
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
Incremental Rainfall Depth
Cline Creek at CCO-2

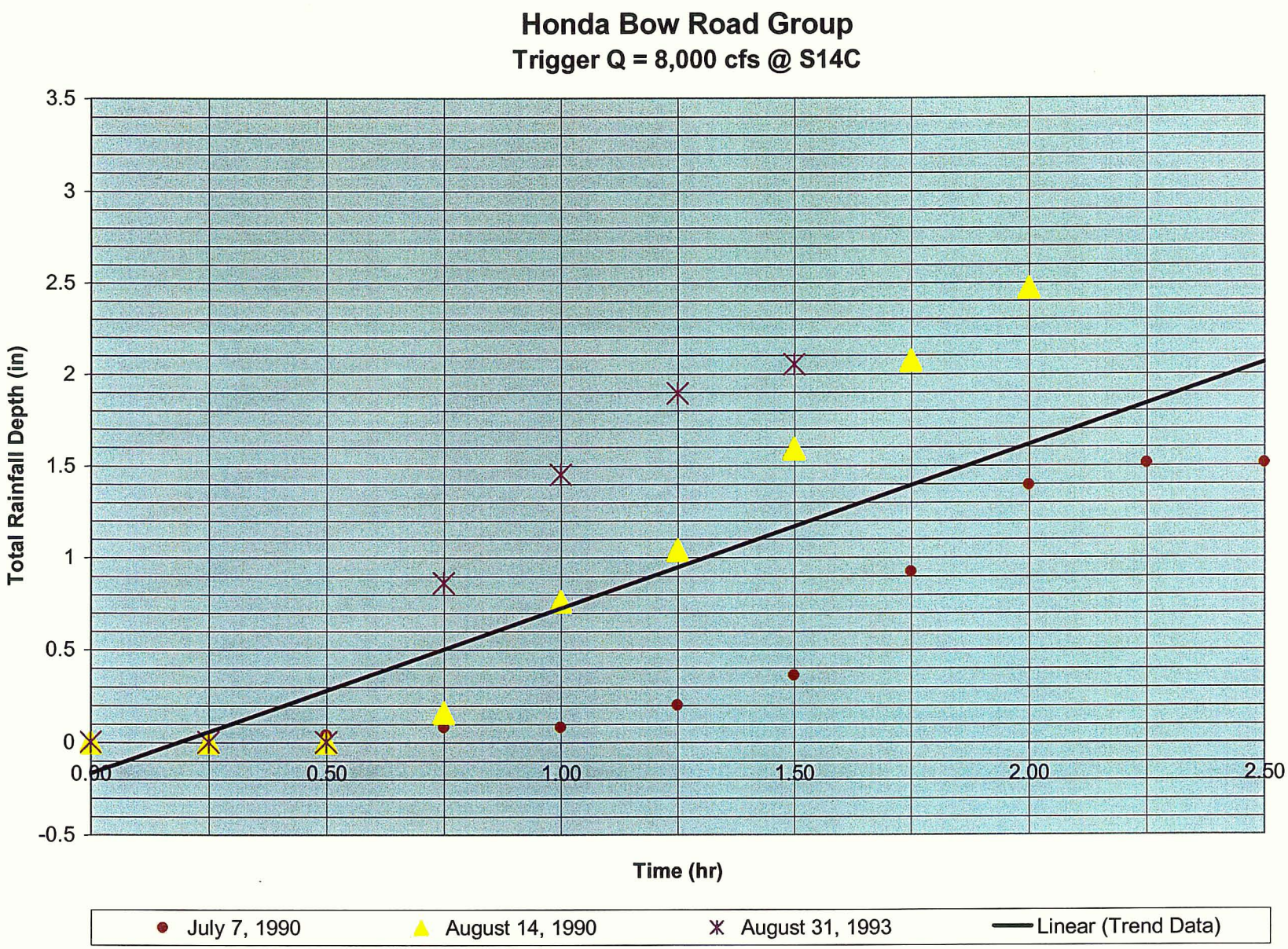

Skunk (S3C) Basin Response Time to August 31, 1993 Actual Storm
25 Minute Lag Time
Time (hr)
0.00
1.00
2.00
3.00
4.00
5.00
6.00
7.00
8.00
Incremental Depth (in)
0.00
0.10
0.20
0.30
0.40
0.50
Runoff (cfs)
4000
3500
3000
2500
2000
1500
1000
500
0
Incremental Rainfall Depth
Skunk Creek at S3C

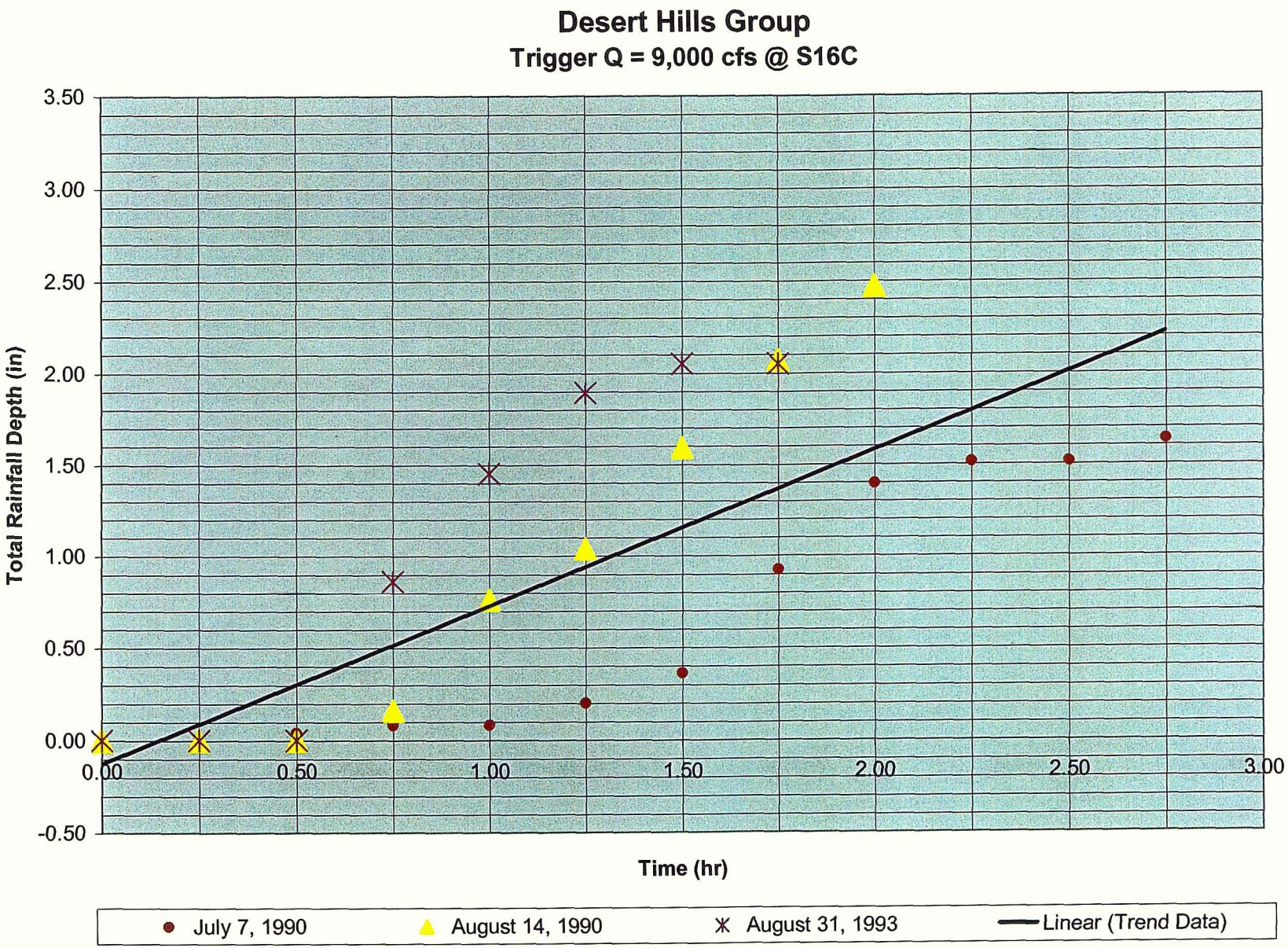

Cline (CCO-2) Basin Response Time to August 31, 1993 Actual Storm
25 Minute Lag Time
Time (hr)
0.00
1.00
2.00
3.00
4.00
5.00
6.00
7.00
8.00
Incremental Depth (in)
0.00
0.10
0.20
0.30
0.40
0.50
Runoff (cfs)
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
Incremental Rainfall Depth
Cline Creek at CCO-2

APPENDIX C-2: Threshold Precipitation Depth Plots


Zorrillo Drive Group
Trigger Q = 4,400 cfs @ S10C
Total Rainfall Depth (in)
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
-0.50
0.00
0.50
1.00
1.50
2.00
Time (hr)
August 14, 1990
August 31, 1993
Linear (Trend Data)


Cline Creek Group
Trigger Q = 10,600 cfs @ CCO-5
Total Rainfall Depth (in)
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
-0.50
-1.00
0.00
0.50
1.00
1.50
2.00
2.50
Time (hr)
August 14, 1990
Linear (Trend Data)


Honda Bow Road Group
Trigger Q = 8,000 cfs @ S14C
Total Rainfall Depth (in)
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
0.00
0.50
1.00
1.50
2.00
2.50
Time (hr)
July 7, 1990
August 14, 1990
August 31, 1993
Linear (Trend Data)


Desert Hills Group
Trigger Q = 9,000 cfs @ S16C
Total Rainfall Depth (in)
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
-0.50
0.00
0.50
1.00
1.50
2.00
2.50
3.00
Time (hr)
July 7, 1990
August 14, 1990
August 31, 1993
Linear (Trend Data)

APPENDIX C-3: Recurrence Interval Curves

sla
SIMONS, LI & ASSOCIATES, INC.

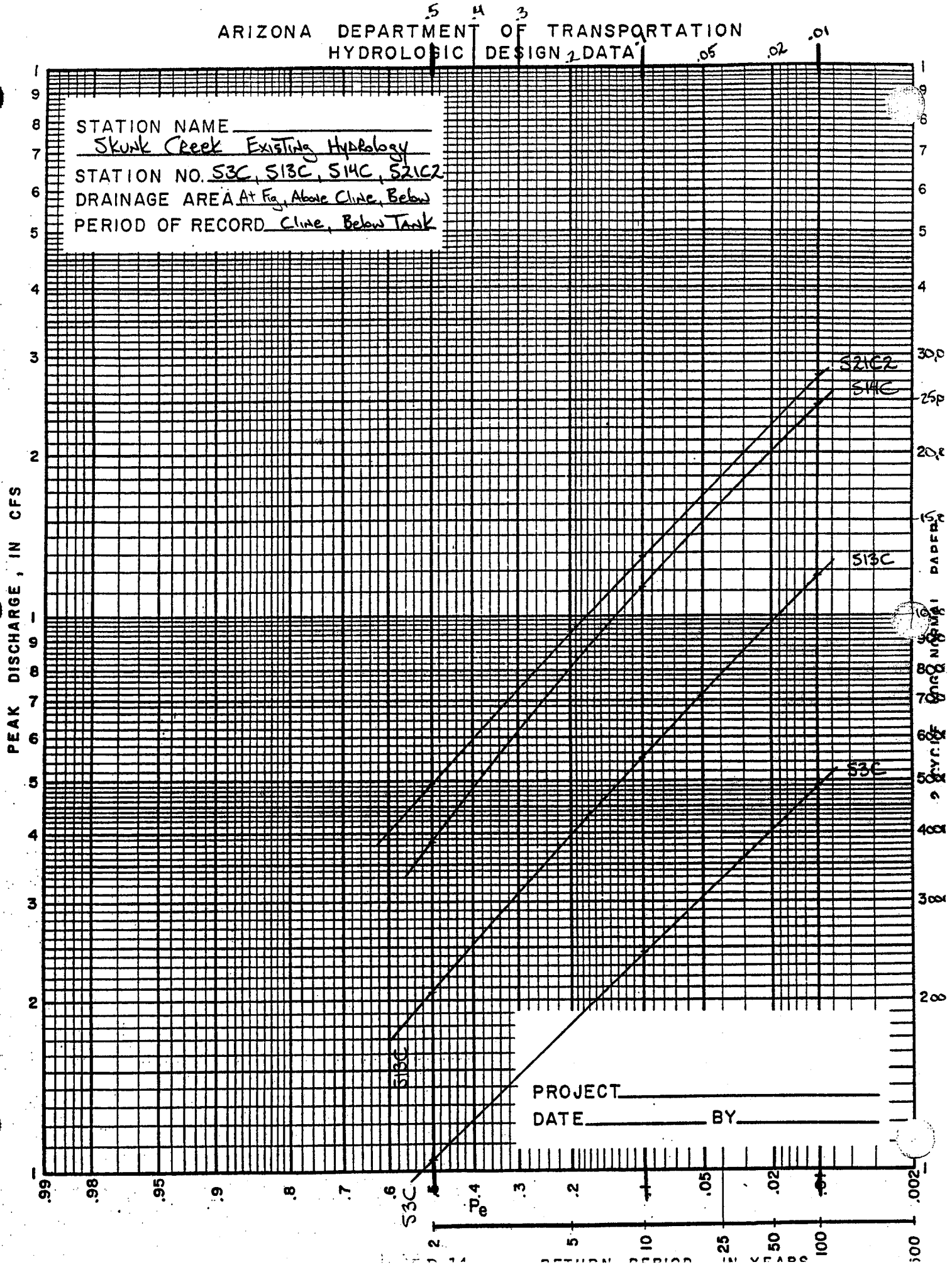
CLIENT Skunk Creek
PROJECT Hydrology DATA
DETAIL

JOB NO.
DATE CHECKED
CHECKED BY

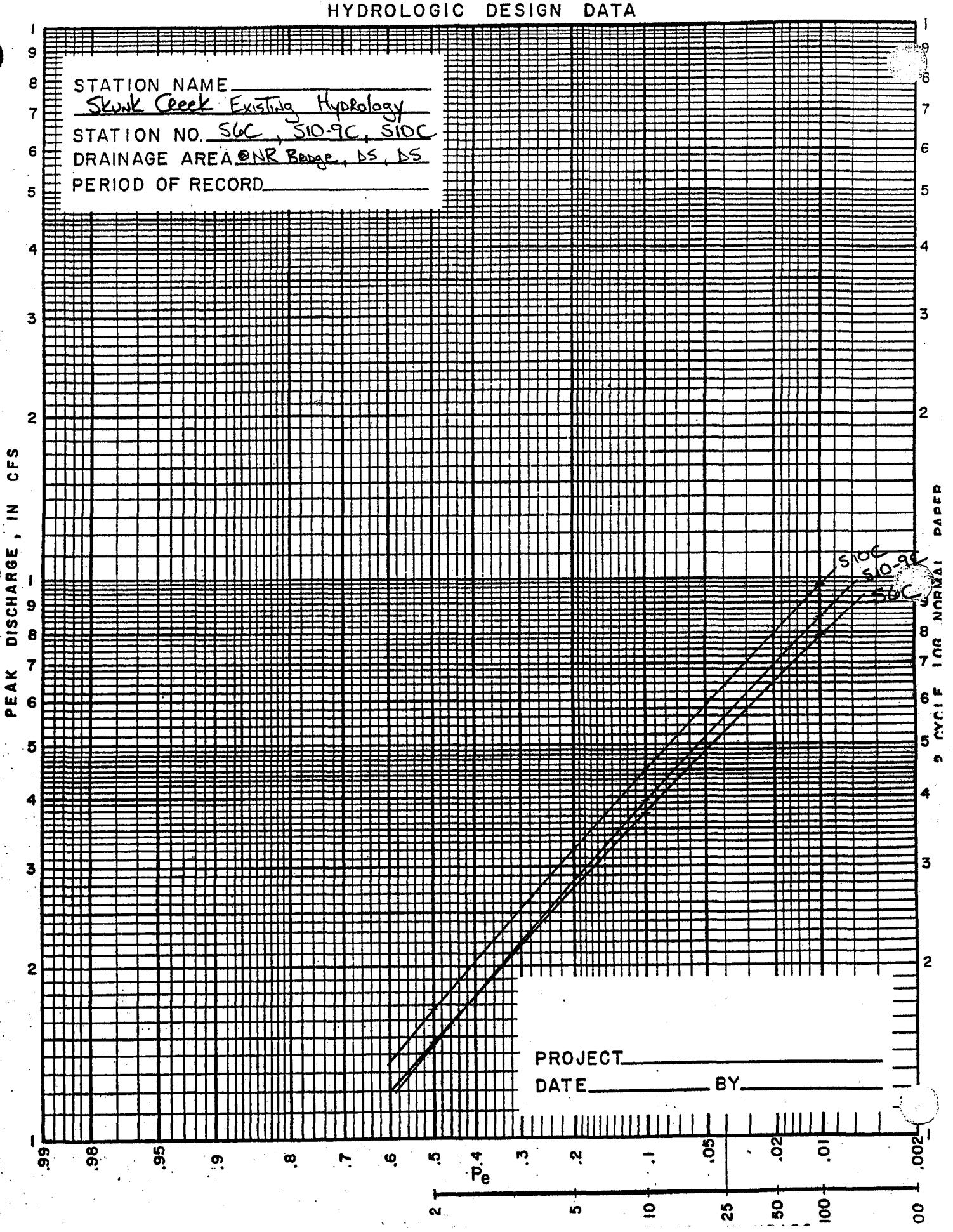
PAGE
DATE 4/19/0
COMPUTED BY 1

		0.5 Existing 2-yr	0.1 Existing 10-yr	0.01 Existing 100-yr	Time to Peak [hrs] SCS 24-hour distribution 2-yr	10-yr	100-yr
At Fig Bo. (gage)	S3C	1,036	2,419	4,899	12.25	12.25	12.25
Above Cline	S13C	2,070	5,485	11,811	12.50	12.50	12.50
Cline US (gage)	CCO-2	1,460	4,887	10,883	12.42	12.25	12.25
Cline	CCO-5	2,149	6,322	13,747	12.58	12.67	12.67
below Cline	S14C	3,845	11,155	24,427	12.67	12.67	12.67
Rodger	CO-2	1,699	3,082	5,624	12.58	12.58	12.58
below Rodger	S16C	4,868	12,778	27,332	12.83	12.92	12.92
At Tank	S21C2	4,948	12,807	27,733	13.25	13.33	13.33
	S10C	1,674	4,494	9,741	12.50	12.50	12.50
	S10-9C	1,458	3,916	8,532		—	—
New Rue Bridge	S6C	1,463	3,718	7,840	12.67	12.58	12.58
Rodger Gage	CO-1	1,519	2,713	4,800	12.25	12.25	12.25

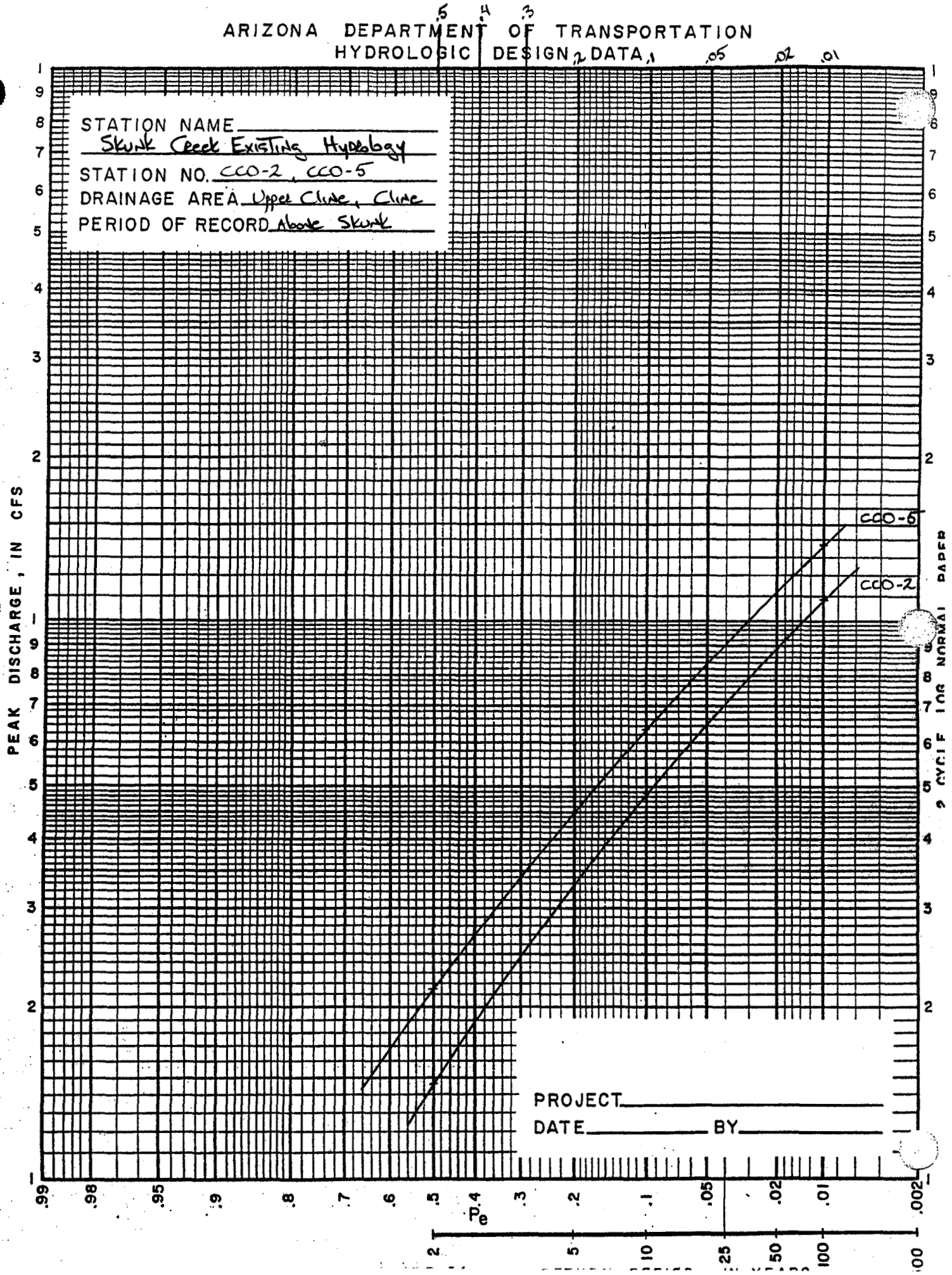
ARIZONA DEPARTMENT OF TRANSPORTATION
HYDROLOGIC DESIGN DATA



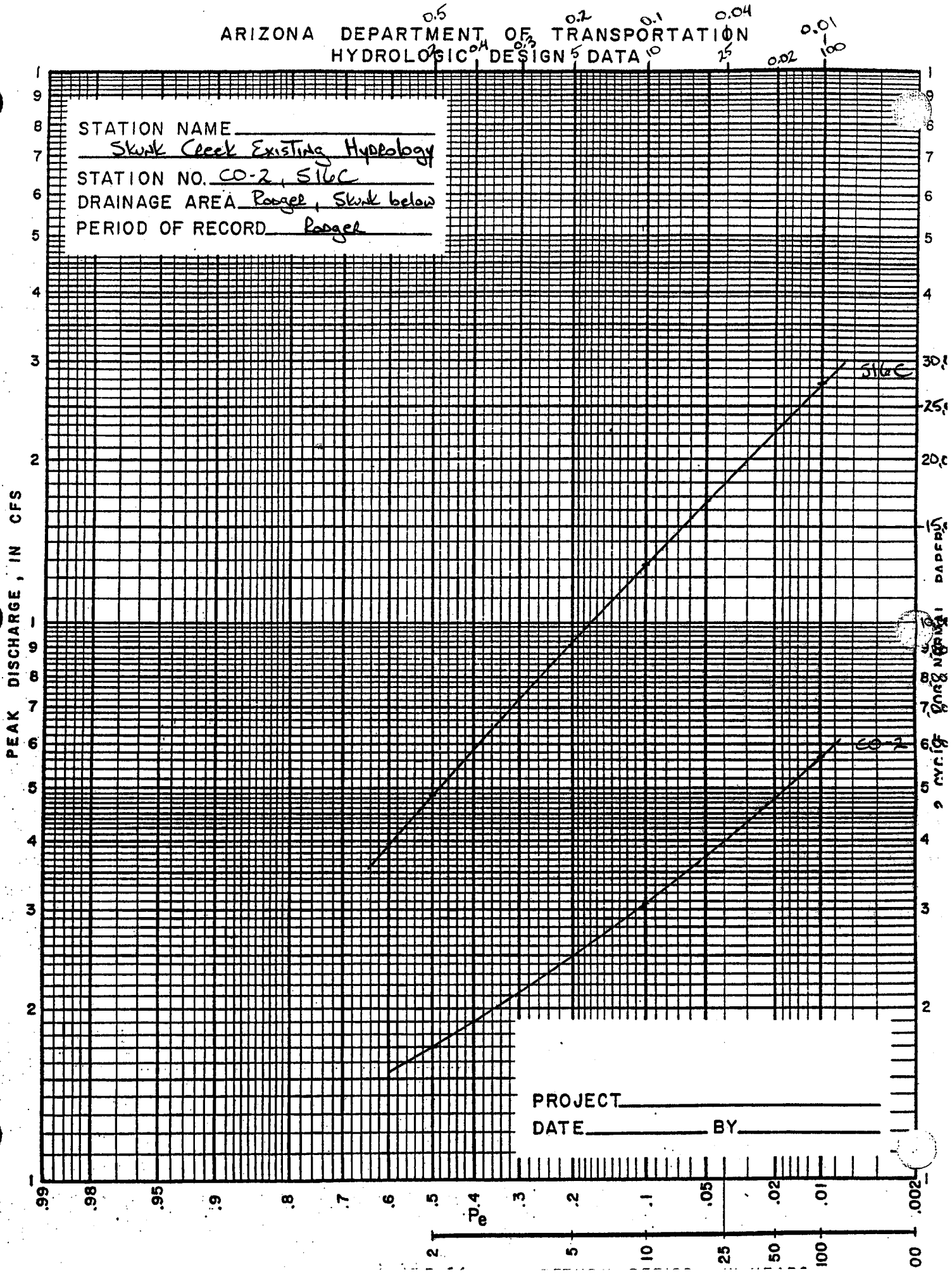
ARIZONA DEPARTMENT OF TRANSPORTATION
HYDROLOGIC DESIGN DATA



ARIZONA DEPARTMENT OF TRANSPORTATION
HYDROLOGIC DESIGN DATA



ARIZONA DEPARTMENT OF TRANSPORTATION
HYDROLOGIC DESIGN DATA

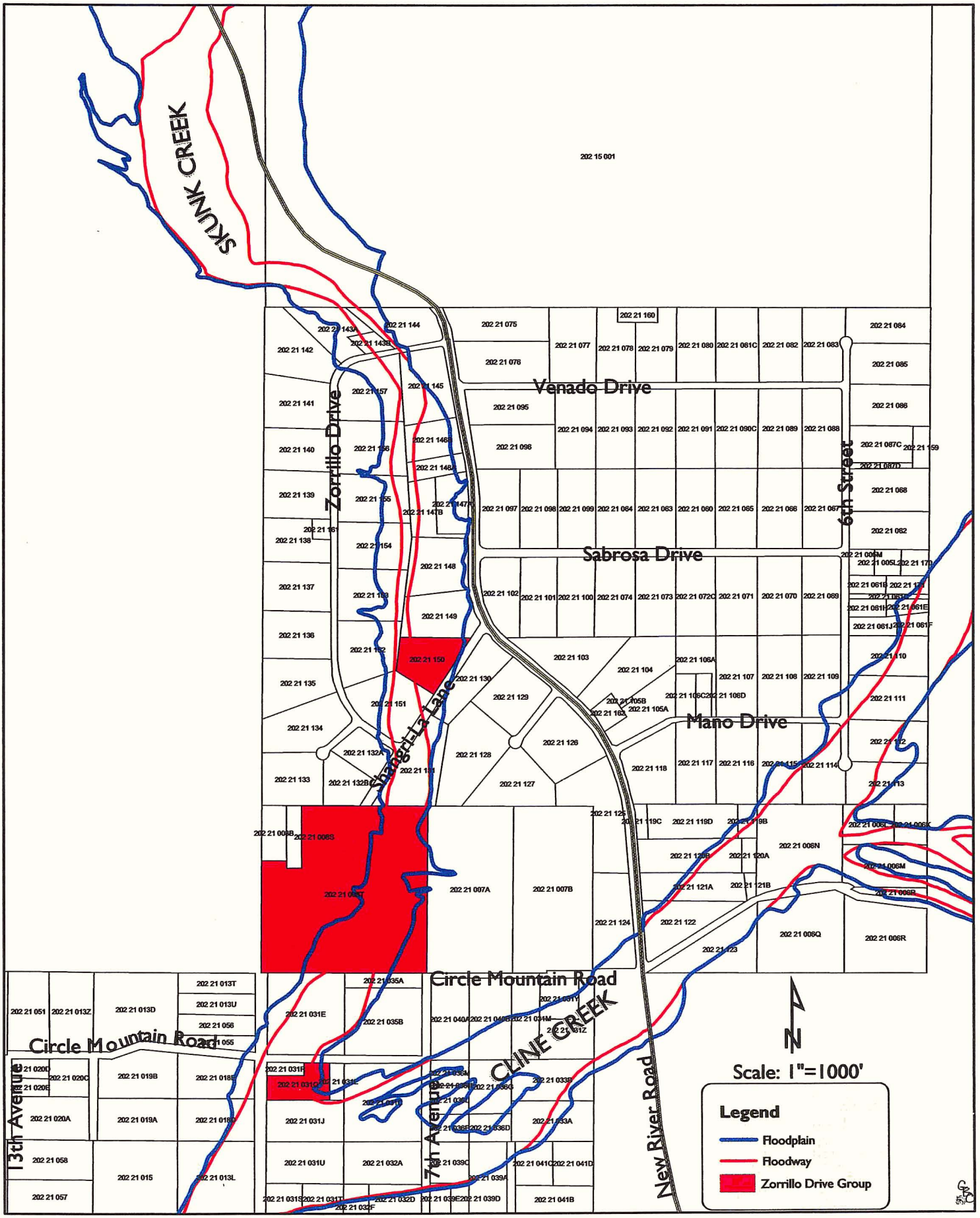


APPENDIX D

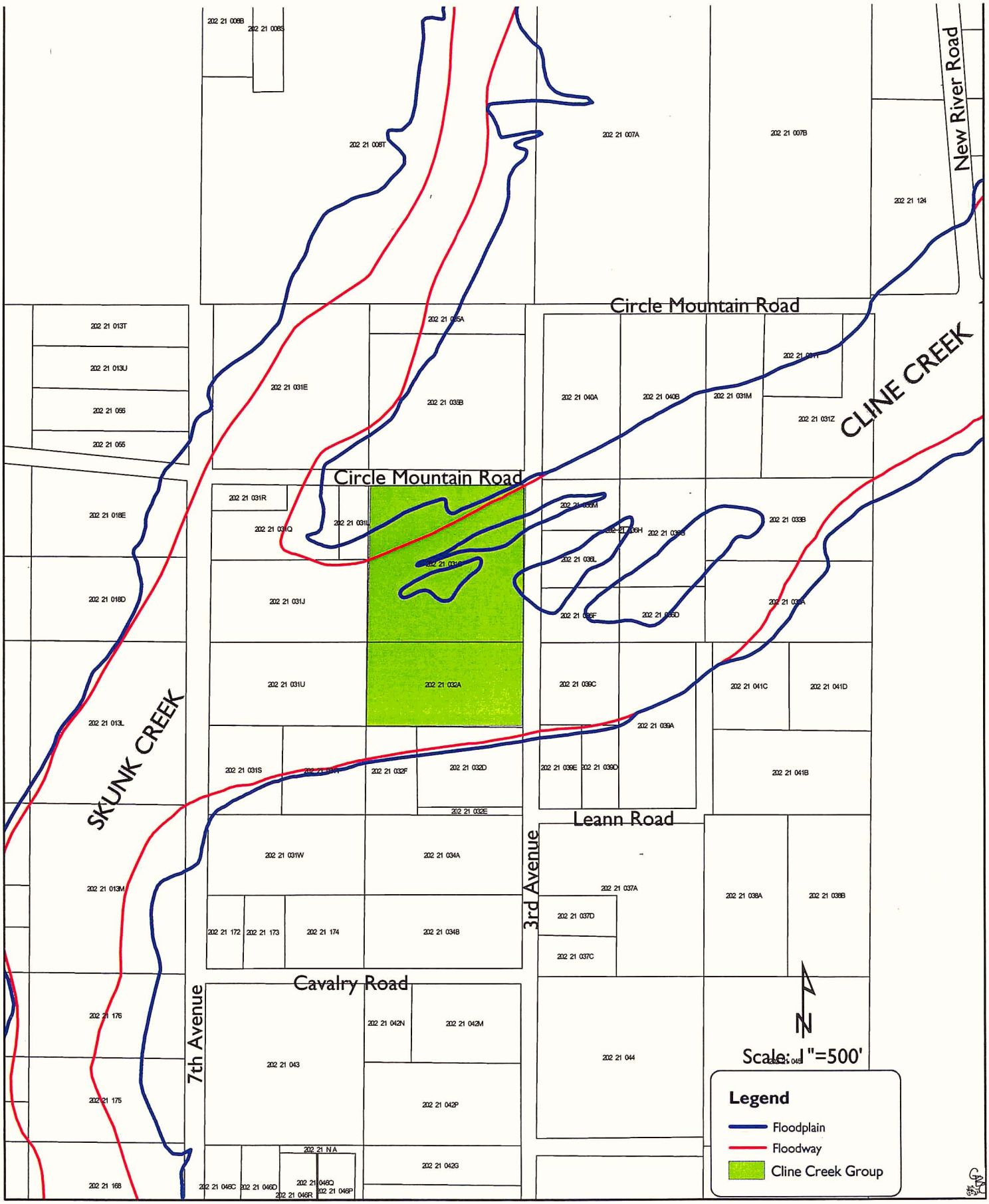
HYDRAULIC ANALYSIS SUPPORTING DATA

D-1: FRP Structure Data
D-2: Roadway Overtopping Plots

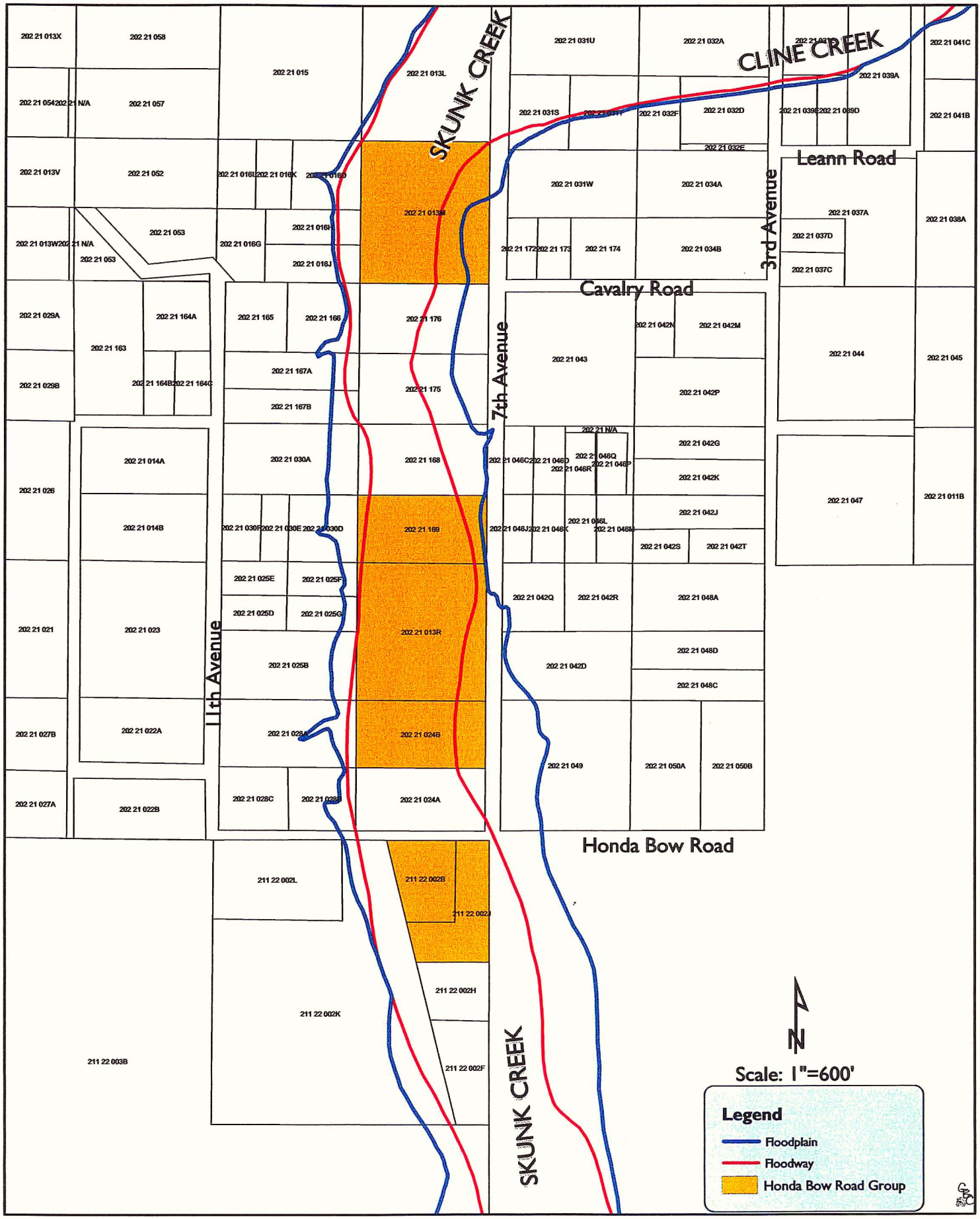
APPENDIX D-1: FRP Structure Data



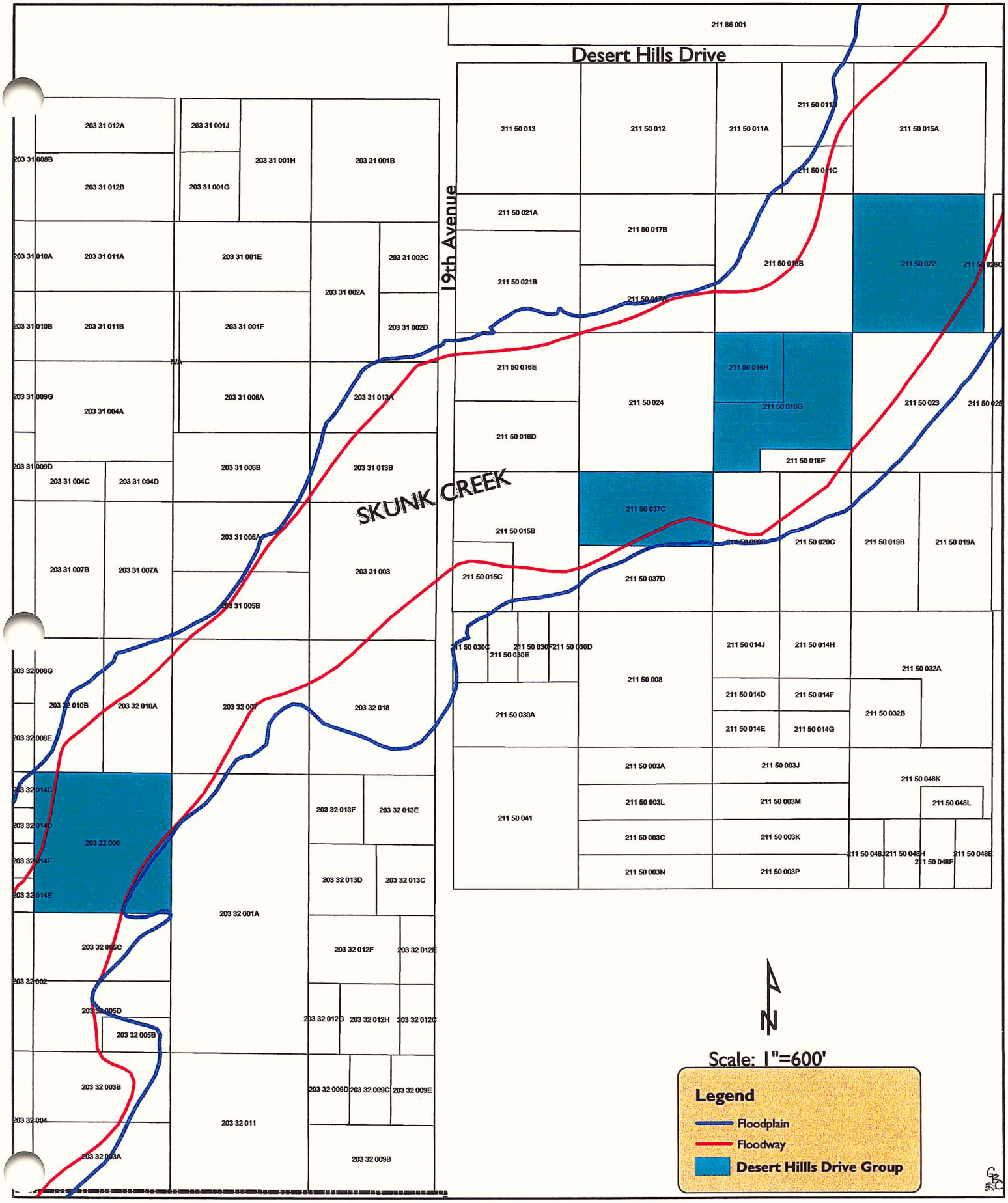
ZORRILLO DRIVE FLOOD HAZARD GROUP



CLINE CREEK FLOOD HAZARD GROUP



HONDA BOW ROAD FLOOD HAZARD GROUP



DESERT HILLS DRIVE FLOOD HAZARD GROUP

SKUNK CREEK FLOOD RESPONSE PLAN

Flow to Reach Finished Floor Elevation and Associated Recurrence Interval

Parcel #	Tag ID	Name	Structure	HEC-RAS Cross Section	100-yr WSEL	FFE Elev	Difference	RAS model Q_{100} [cfs]	Q_{FFE} (or Q_{ground}, mobiles) [cfs]	Approx. Recurrence Interval	Overbank Flow Velocity‡ [fps]
211-50-037C	104	Mathis	Mobile	20.26	1830.65	1831.54	-0.89	27,300	13,600	12	5 to 6
211-50-037C	104	Mathis	House	20.32	1833.30	1832.54	0.76	27,300	19,600	31	5 to 6
211-50-016H	929	Birdsell	Mobile	---	1837.22	?	---	27,300	25,000	71	5 to 6
211-50-016J	84	Harper	Mobile 3	20.45	1839.39	1840.43	-1.04	27,300	13,500	12-yr	5 to 6
211-50-016J	84	Harper	Mobile 2	20.45	1839.39	1840.32	-0.93	27,300	14,250	13-yr	5 to 6
211-50-016J	84	Harper	Mobile 1	20.47	1840.58	1842.17	-1.59	27,300	13,000	11-yr	5 to 6
211-50-022	62	Hopwood Trust	Mobile 2	20.53	1843.80	1844.34	-0.54	27,300	11,700	8-yr	4 to 5
211-50-022	62	Hopwood Trust	House 1	20.55	1844.89	1844.87	0.02	27,300	27,000	100-yr	4 to 5
211-50-022	62	Hopwood Trust	Mobile 3	20.56	1845.66	1845.22	0.44	27,300	9,000	5-yr	4 to 5
211-50-022	62	Hopwood Trust	Mobile 1	20.61	1847.62	1848.55	-0.93	27,300	15,000	15-yr	4 to 5
211-50-022	62	Hopwood Trust	House 2	---	1845.66[1]	1845.48	0.18	27,300	25,000	71-yr	4 to 5
211-22-002J	6	Geraci	Mobile	22.87	1965.40	1965.42	-0.02	24,400	13,500	16	5
211-22-002B	5	McKeag	House	22.90	1968.29	1965.25	3.04	24,400	8,000	5	5
202-21-024B	616	Albert	House	22.95	1973.36	1971.42	1.94	24,400	12,200	13	4 to 5
202-21-013R	585	Eller	House	23.12	1980.24	1979.29	0.95	24,400	18,000	34	4
202-21-169	847	Hines	House	23.20	1984.20	1980.93	3.27	24,400	8,000	5	4
202-21-013M	584	Funk	House	23.44	1997.41	1996.58	0.83	24,400	19,000	42	3 to 7
202-21-032A	647	Caldwell	House	---	2021.74	2021.44	0.30	16,700	13,300	91-yr	2 to 6
202-21-031C	634	Selleys	House	---	2024.80	?	---	16,700	10,600[2]	40-yr	?
202-21-031Q	639	Sartain	House 1	23.83	2016.49	2017.10	-0.61	11,800	>11,800	>100-yr	3 to 4

[1] WSEL set to match neighboring structure from model

[2] Flow interpolated to estimated ground elevation (EGE)

‡By Stantech, from floodplain model

Used "Desert Hills Split Flow" model for these homes; Minimum Breakout Flow = 8,000 cfs

Interpolated WSEL between cross-sections

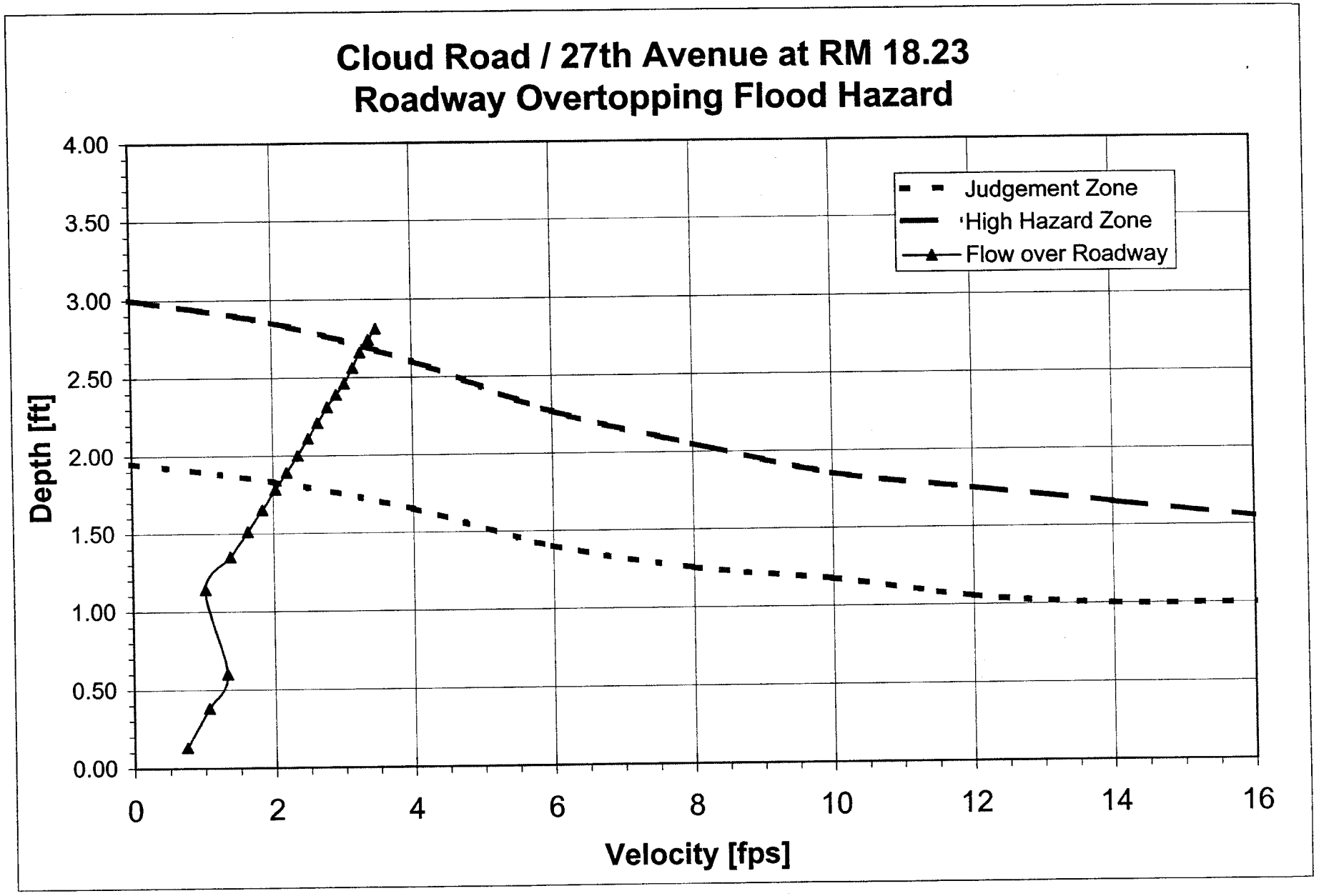
all structures recurrence int.xls
8/24/01

SKUNK CREEK FLOOD RESPONSE PLAN
Flow to Estimated Ground Elevation and Associated Recurrence Interval

Parcel #	Tag ID	Name	Structure	DS Xsec	US Xsec	Estimated Ground Elevation (EGE)	Flow to EGE - 6"	Flow to EGE	Flow to EGE + 6"	Flow to EGE + 12"	HEC-1 Conc. Pt.	HEC-1 100-yr Flow	Return Frequency to EGE - 6"	Return Frequency to EGE	Return Frequency to EGE + 6"	Return Frequency to EGE + 12"
202-21-008T	579	Kraus Investmnt	Mobile	24.03	24.12	2024	3,400	4,400	5,600	7,000	S13C	11,800	4	6	11	19
202-21-008T	579	Kraus Investmnt	Mobile	24.03	24.12	2025	3,800	5,000	6,200	8,000	S13C	11,800	5	8	13	26
202-21-008T	579	Kraus Investmnt	2 Mobiles	24.12	24.25	2029	5,800	7,200	9,000	—	S13C	11,800	11	20	38	—
202-21-008T	579	Kraus Investmnt	Restaurant	24.03	24.12	2026	6,600	8,600	10,200	11,600	S13C	11,800	16	33	62	95
202-21-150	826	Parry	Mobile	24.48	24.61	2045	4,000	5,000	6,400	—	S10C	9,700	8	13	26	—
202-21-150	826	Parry	House	24.48	24.61	2046	5,000	6,200	7,800	>9,700	S10C	9,700	13	24	45	>100
202-21-031C	634	Selleys	House	CL 0.327	CL 0.403	2024		10,600			CCO-5	13,750		40		
202-21-032A	647	Caldwell	House	CL 0.247	CL 0.327	2021.4*		13,300	*to FFE		CCO-5	13,750		91		

*Surveyed finished floor elevation

APPENDIX D-2: Roadway Overtopping Plots

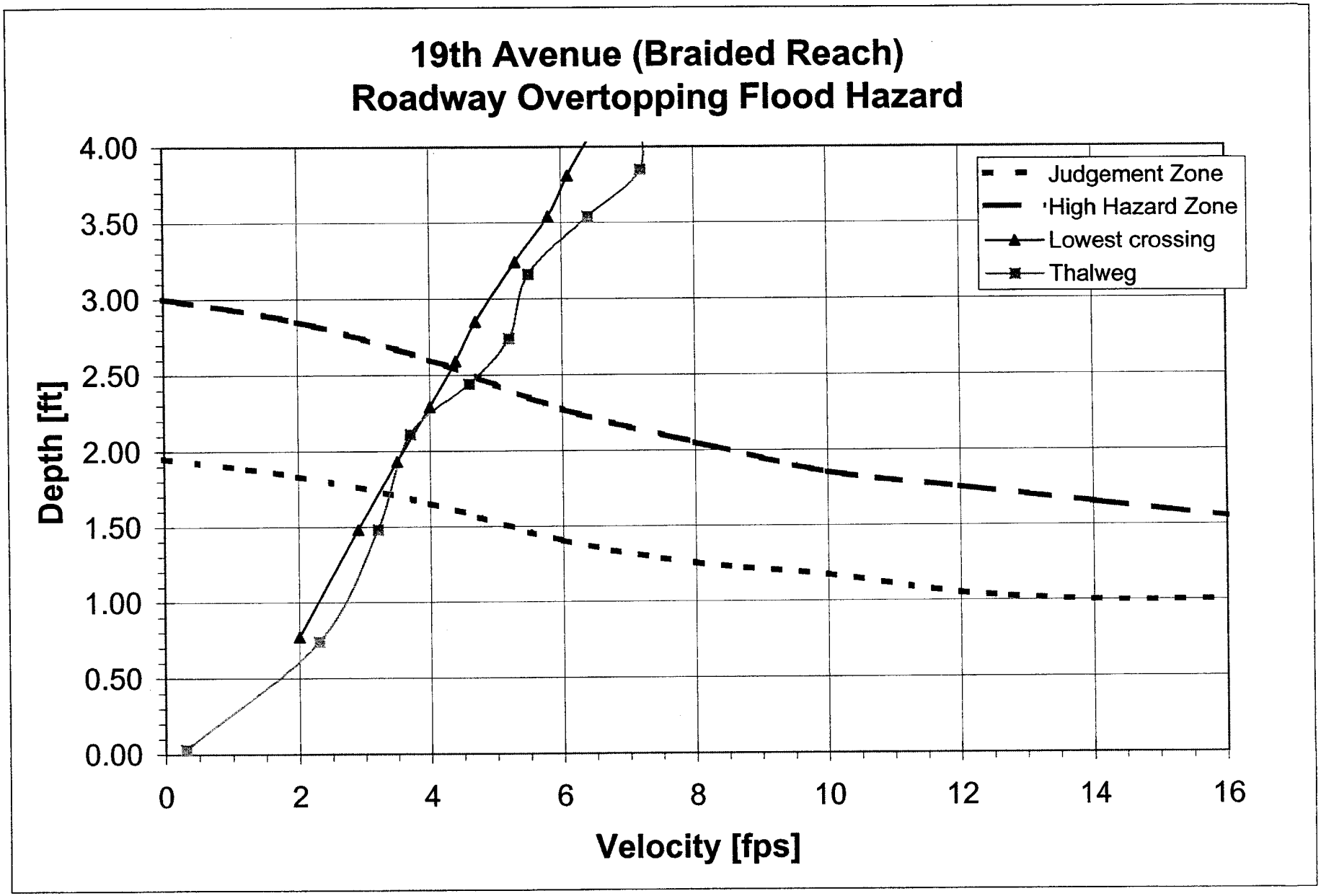

Cloud Road / 27th Avenue at RM 18.23
Roadway Overtopping Flood Hazard
Judgement Zone
High Hazard Zone
Flow over Roadway
Depth [ft]
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
0
2
4
6
8
10
12
14
16
Velocity [fps]

Roadway Overtopping Analysis

Graph Data

Cloud Rd / 27th Avenue at RM 18.23
(culvert capacity ignored)

Q Total (cfs)	Depth (ft)	Velocity (ft/s)	Q Overtop (cfs)
9,000	0.13	0.7	8
10,000	0.38	1.1	34
11,000	0.60	1.3	81
12,000	1.14	1.0	244
13,000	1.35	1.4	547
14,000	1.51	1.6	832
15,000	1.65	1.8	1,144
16,000	1.78	2.0	1,463
17,000	1.89	2.2	1,762
18,000	2.00	2.4	2,105
19,000	2.11	2.5	2,454
20,000	2.21	2.6	2,802
21,000	2.31	2.8	3,163
22,000	2.39	2.9	3,517
23,000	2.46	3.0	3,844
24,000	2.56	3.2	4,238
25,000	2.66	3.3	4,657
26,000	2.74	3.4	5,043
27,000	2.81	3.5	5,420


19th Avenue (Braided Reach)
Roadway Overtopping Flood Hazard
Depth [ft]
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
0
2
4
6
8
10
12
14
16
Velocity [fps]
Judgement Zone
High Hazard Zone
Lowest crossing
Thalweg

Roadway Overtopping Analysis

Graph Data

19th Avenue, lowest point on topo

HEC-RAS X-sec	Q Total (cfs)	W.S. Elev (ft)	Depth Chnl (ft)	Vel Chnl (ft/s)	Q Channel (cfs)
20.08	500	1814.77	0.77	2.0	83
20.08	1,000	1815.48	1.48	2.9	293
20.08	1,500	1815.93	1.93	3.5	504
20.08	2,000	1816.29	2.29	4.0	731
20.08	2,500	1816.59	2.59	4.4	944
20.08	3,000	1816.85	2.85	4.7	1,154
20.08	4,000	1817.24	3.24	5.3	1,521
20.08	5,000	1817.54	3.54	5.8	1,851
20.08	6,000	1817.81	3.81	6.1	2,160
20.08	7,000	1818.04	4.04	6.4	2,456
20.08	8,000	1818.24	4.24	6.7	2,709
20.08	9,000	1818.44	4.44	6.9	2,949
20.08	10,000	1818.62	4.62	7.0	3,183
20.08	11,000	1818.79	4.79	7.2	3,411
20.08	12,000	1818.96	4.96	7.4	3,643
20.08	13,000	1819.12	5.12	7.5	3,870
20.08	14,000	1819.27	5.27	7.6	4,079
20.08	15,000	1819.42	5.42	7.7	4,293
20.08	16,000	1819.57	5.57	7.8	4,488
20.08	17,000	1819.72	5.72	7.9	4,681
20.08	18,000	1819.85	5.85	8.0	4,877
20.08	19,000	1819.98	5.98	8.1	5,070
20.08	20,000	1820.10	6.10	8.2	5,273
20.08	21,000	1820.22	6.22	8.3	5,474

Roadway Overtopping Analysis

Graph Data

19th Avenue, thalweg

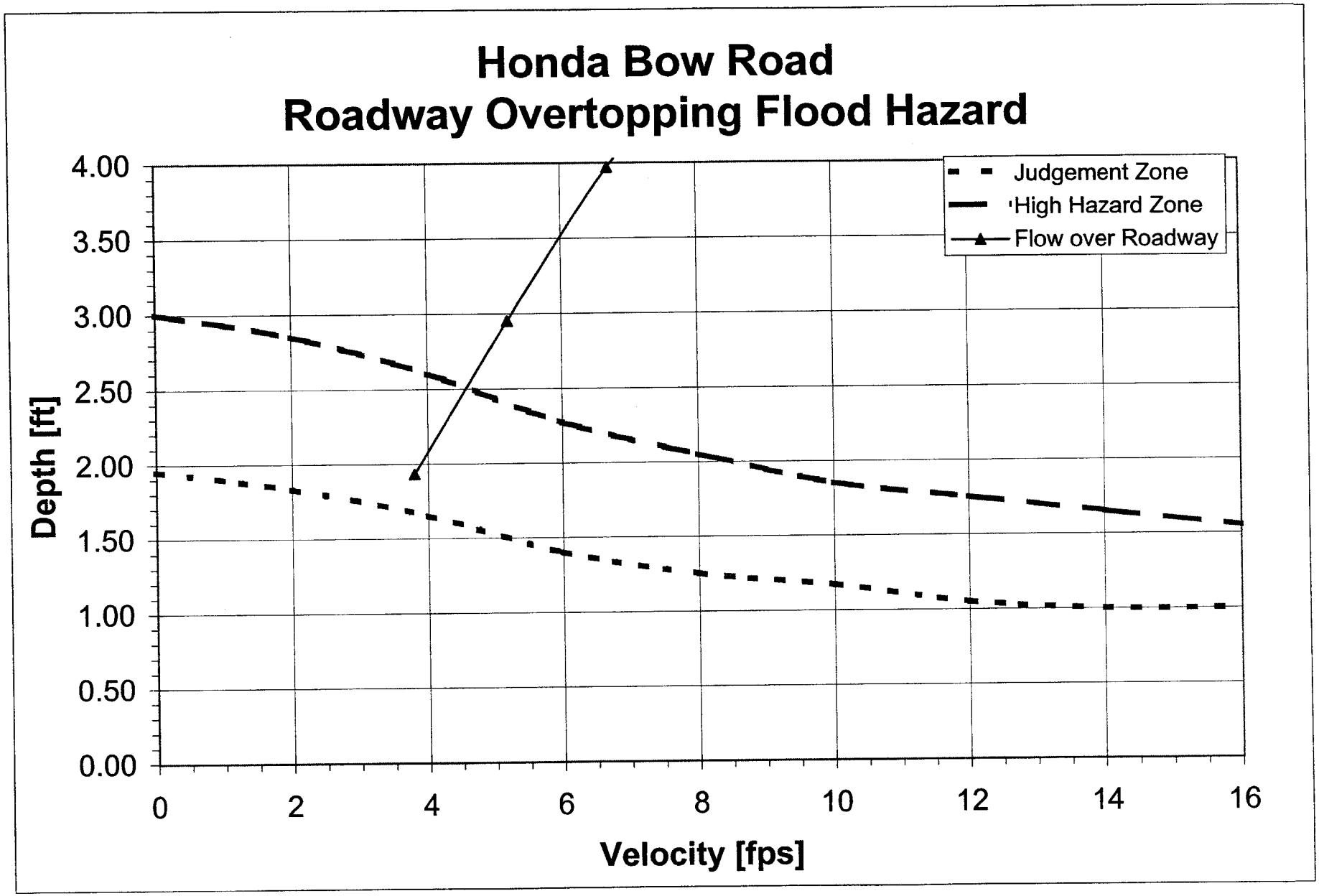
HEC-RAS X-sec	Q Total (cfs)	W.S. Elev (ft)	Depth Chnl (ft)	Vel Chnl (ft/s)	Q Channel (cfs)
20.13	200	1816.03	0.03	0.3	0
20.13	500	1816.74	0.74	2.3	16
20.13	1,000	1817.48	1.48	3.2	108
20.13	1,500	1818.11	2.11	3.7	294
20.13	2,000	1818.44	2.44	4.6	498
20.13	2,500	1818.74	2.74	5.2	717
20.13	3,000	1819.16	3.16	5.5	977
20.13	4,000	1819.54	3.54	6.4	1,392
20.13	5,000	1819.85	3.85	7.2	1,806
20.13	6,000	1820.25	4.25	7.2	2,151
20.13	7,000	1820.50	4.50	7.4	2,461
20.13	8,000	1820.74	4.74	7.6	2,787
20.13	9,000	1820.93	4.93	7.7	3,065
20.13	10,000	1821.12	5.12	7.9	3,401
20.13	11,000	1821.26	5.26	8.2	3,758
20.13	12,000	1821.36	5.36	8.6	4,071
20.13	13,000	1821.48	5.48	8.8	4,365
20.13	14,000	1821.59	5.59	9.0	4,658
20.13	15,000	1821.69	5.69	9.3	4,950
20.13	16,000	1821.78	5.78	9.6	5,241
20.13	17,000	1821.85	5.85	9.9	5,535
20.13	18,000	1821.97	5.97	10.0	5,805
20.13	19,000	1822.08	6.08	10.1	6,092
20.13	20,000	1822.16	6.16	10.3	6,370
20.13	21,000	1822.25	6.25	10.5	6,639

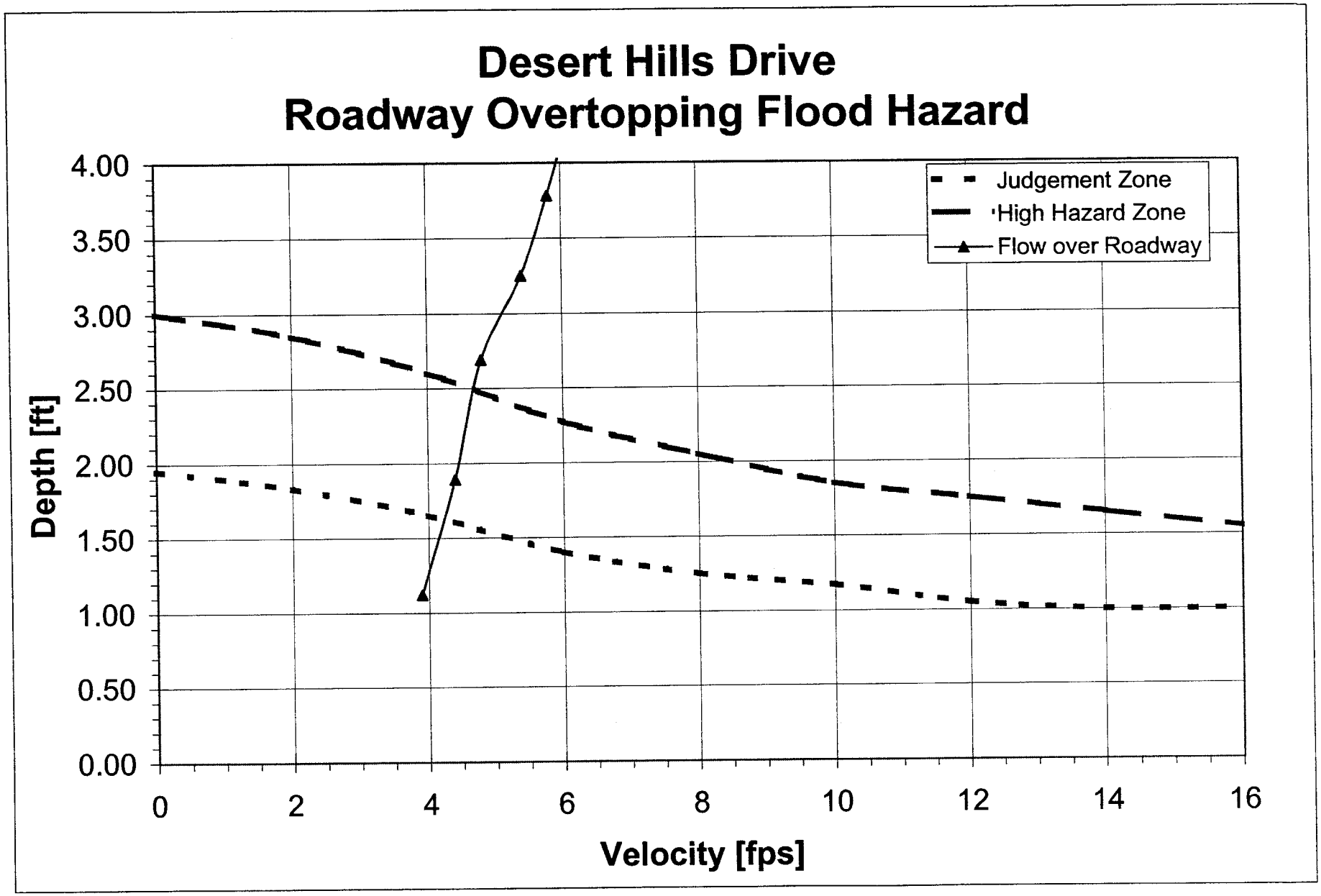
Roadway Overtopping Analysis

Graph Data

Desert Hills Drive

HEC-RAS X-sec	Q Total (cfs)	W.S. Elev (ft)	Depth Chnl (ft)	Vel Chnl (ft/s)	Q Channel (cfs)
20.77	200	1847.12	1.12	3.9	200
20.77	500	1847.89	1.89	4.4	500
20.77	1,000	1848.69	2.69	4.8	1,000
20.77	1,500	1849.25	3.25	5.4	1,500
20.77	2,000	1849.78	3.78	5.8	2,000
20.77	2,500	1850.24	4.24	6.1	2,494
20.77	3,000	1850.63	4.63	6.4	2,955
20.77	4,000	1851.32	5.32	6.7	3,768
20.77	5,000	1851.80	5.80	7.1	4,519
20.77	6,000	1851.92	5.92	8.2	5,364
20.77	7,000	1852.19	6.19	9.0	6,243
20.77	8,000	1852.46	6.46	9.3	6,850
20.77	9,000	1852.98	6.98	8.5	6,988
20.77	10,000	1853.18	7.18	8.7	7,422
20.77	11,000	1853.30	7.30	9.1	7,935
20.77	12,000	1853.46	7.46	9.3	8,352
20.77	13,000	1853.59	7.59	9.5	8,763
20.77	14,000	1853.74	7.74	9.7	9,132
20.77	15,000	1853.82	7.82	10.0	9,601
20.77	16,000	1854.13	8.13	9.7	9,772
20.77	17,000	1854.19	8.19	10.0	10,219
20.77	18,000	1854.29	8.29	10.2	10,575
20.77	19,000	1854.43	8.43	10.1	10,766
20.77	20,000	1854.49	8.49	10.4	11,154
20.77	21,000	1854.55	8.55	10.7	11,555


Honda Bow Road
Roadway Overtopping Flood Hazard
Judgement Zone
High Hazard Zone
Flow over Roadway
Depth [ft]
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
0
2
4
6
8
10
12
14
16
Velocity [fps]

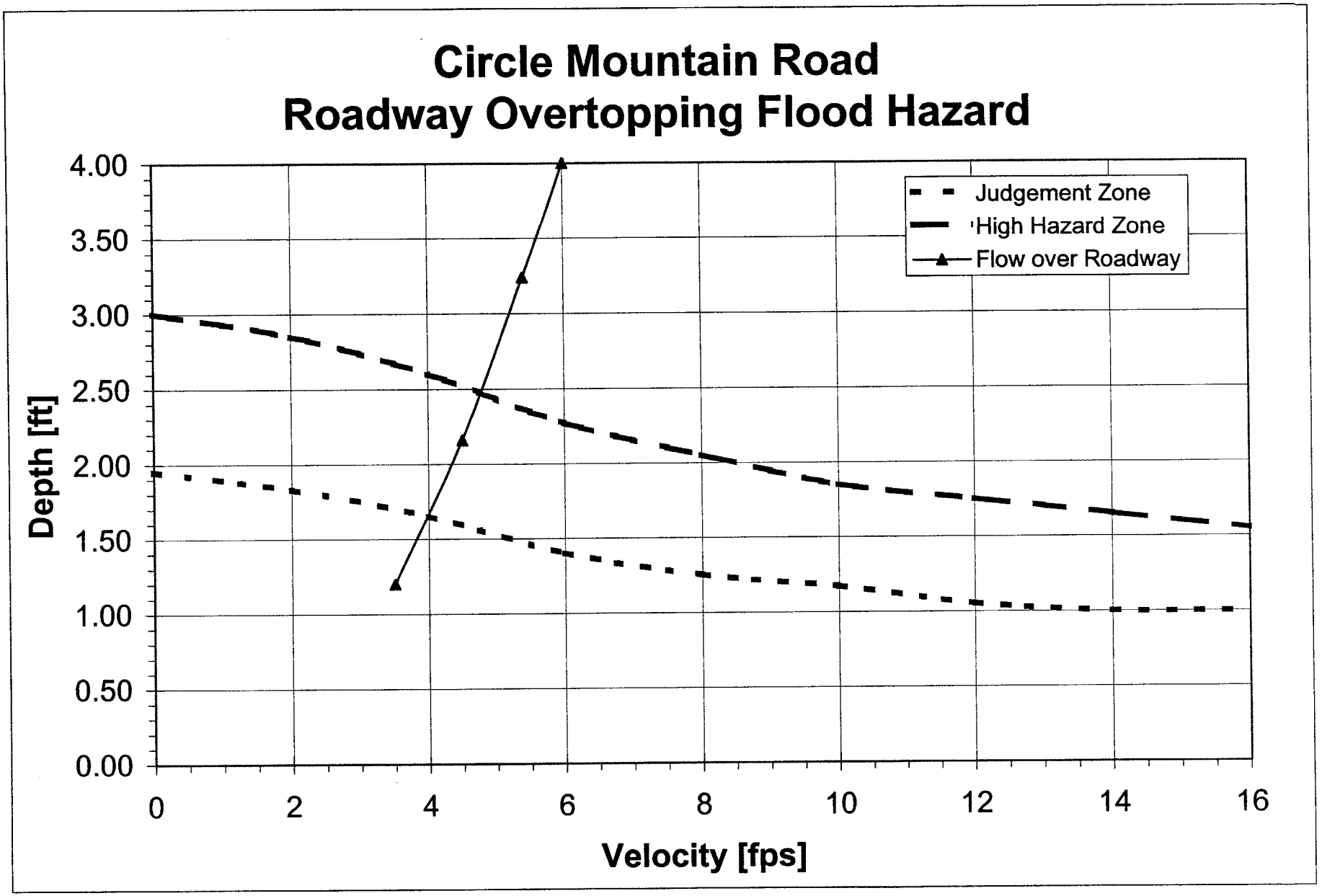

Desert Hills Drive
Roadway Overtopping Flood Hazard
Judgement Zone
High Hazard Zone
Flow over Roadway
Depth [ft]
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
0
2
4
6
8
10
12
14
16
Velocity [fps]

Roadway Overtopping Analysis

Graph Data

Honda Bow Road

HEC-RAS X-sec	Q Total (cfs)	W.S. Elev (ft)	Depth Chnl (ft)	Vel Chnl (ft/s)	Q Channel (cfs)
22.86	200	1955.43	1.93	3.8	200
22.86	500	1956.45	2.95	5.2	500
22.86	1,000	1957.47	3.97	6.7	1,000
22.86	1,500	1958.16	4.66	8.0	1,498
22.86	2,000	1958.70	5.20	9.0	1,967
22.86	2,500	1959.16	5.66	9.7	2,408
22.86	3,000	1959.56	6.06	10.3	2,827
22.86	4,000	1960.92	7.42	9.0	3,268
22.86	5,000	1961.43	7.93	9.2	3,651
22.86	6,000	1961.78	8.28	9.6	4,033
22.86	7,000	1962.04	8.54	10.1	4,425
22.86	8,000	1962.39	8.89	10.1	4,644
22.86	9,000	1962.68	9.18	10.0	4,789
22.86	10,000	1962.84	9.34	10.3	5,068
22.86	11,000	1963.00	9.50	10.7	5,328
22.86	12,000	1963.13	9.63	11.0	5,598
22.86	13,000	1963.25	9.75	11.3	5,855
22.86	14,000	1963.38	9.88	11.6	6,096
22.86	15,000	1963.49	9.99	11.9	6,335
22.86	16,000	1963.61	10.11	12.1	6,556
22.86	17,000	1963.71	10.21	12.5	6,809
22.86	18,000	1963.80	10.30	12.7	7,041
22.86	19,000	1963.92	10.42	12.9	7,233
22.86	20,000	1963.99	10.49	13.3	7,492
22.86	21,000	1964.06	10.56	13.6	7,743

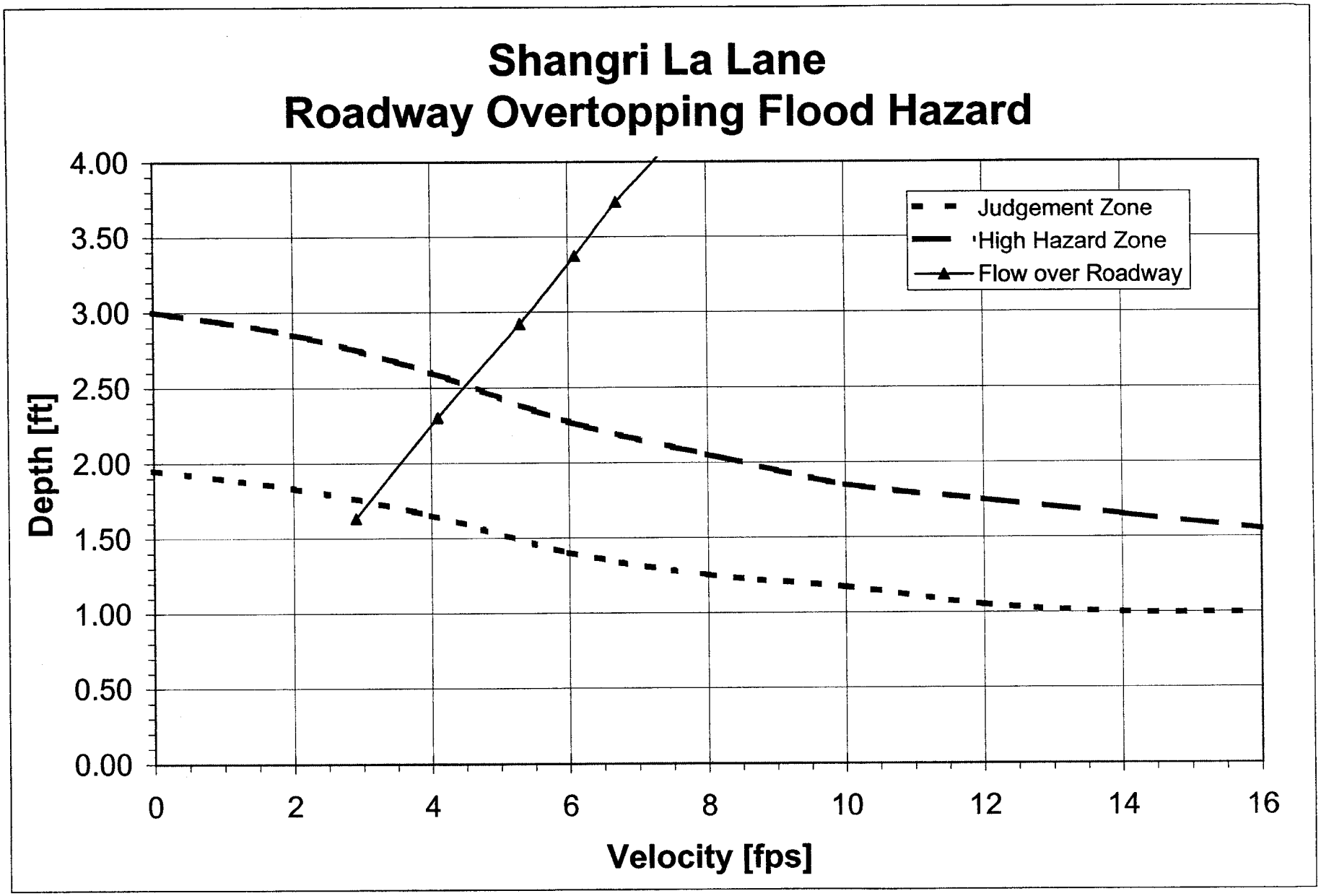

Circle Mountain Road
Roadway Overtopping Flood Hazard
Depth [ft]
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
0
2
4
6
8
10
12
14
16
Velocity [fps]
Judgement Zone
High Hazard Zone
Flow over Roadway

Roadway Overtopping Analysis

Graph Data

Circle Mtn Road

HEC-RAS X-sec	Q Total (cfs)	W.S. Elev (ft)	Depth Chnl (ft)	Vel Chnl (ft/s)	Q Channel (cfs)
23.83	200	2009.20	1.20	3.5	200
23.83	500	2010.16	2.16	4.5	500
23.83	1,000	2011.24	3.24	5.4	980
23.83	1,500	2012.00	4.00	6.0	1,420
23.83	2,000	2012.63	4.63	6.4	1,835
23.83	2,500	2013.15	5.15	6.6	2,199
23.83	3,000	2013.57	5.57	6.8	2,526
23.83	4,000	2014.25	6.25	7.2	3,176
23.83	5,000	2014.71	6.71	7.5	3,676
23.83	6,000	2015.11	7.11	7.9	4,156
23.83	7,000	2015.48	7.48	8.2	4,618
23.83	8,000	2015.81	7.81	8.4	5,072
23.83	9,000	2016.16	8.16	8.9	5,656
23.83	10,000	2016.45	8.45	9.1	6,074
23.83	11,000	2016.67	8.67	9.5	6,515
23.83	12,000	2016.93	8.93	9.7	6,915
23.83	13,000	2017.12	9.12	10.0	7,342
23.83	14,000	2017.37	9.37	10.1	7,709
23.83	15,000	2017.59	9.59	10.3	8,091
23.83	16,000	2017.79	9.79	10.6	8,471
23.83	17,000	2017.99	9.99	10.7	8,837
23.83	18,000	2018.19	10.19	10.9	9,203
23.83	19,000	2018.38	10.38	11.1	9,573
23.83	20,000	2018.58	10.58	11.2	9,929
23.83	21,000	2018.77	10.77	11.4	10,310

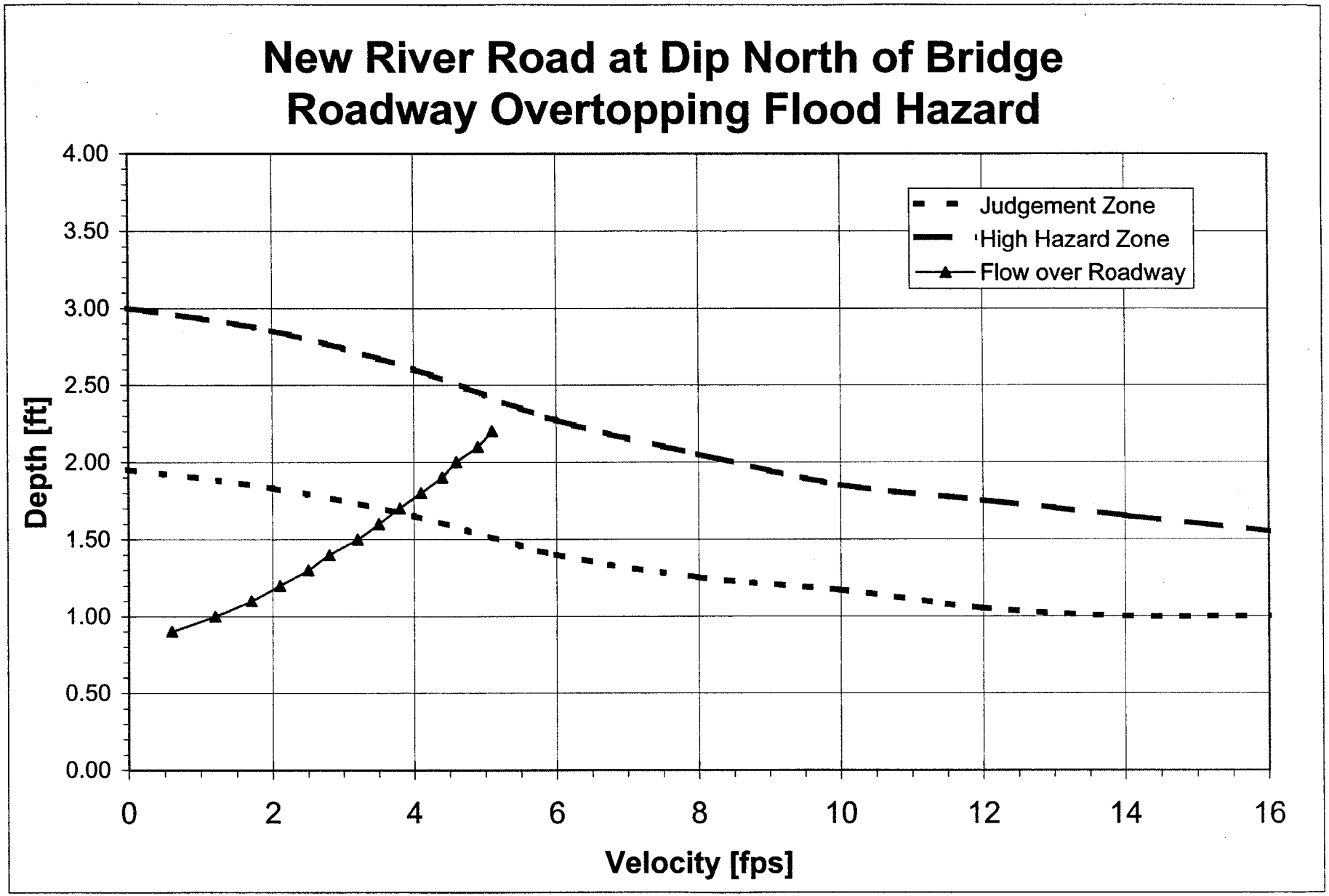

Shangri La Lane
Roadway Overtopping Flood Hazard
Depth [ft]
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
0
2
4
6
8
10
12
14
16
Velocity [fps]
Judgement Zone
High Hazard Zone
Flow over Roadway

Roadway Overtopping Analysis

Graph Data

Shangri La Lane

HEC-RAS X-sec	Q Total (cfs)	W.S. Elev (ft)	Depth Chnl (ft)	Vel Chnl (ft/s)	Q Channel (cfs)
24.48	200	2038.43	1.63	2.9	200
24.48	500	2039.10	2.30	4.1	494
24.48	1,000	2039.72	2.92	5.3	926
24.48	1,500	2040.17	3.37	6.1	1,299
24.48	2,000	2040.53	3.73	6.7	1,652
24.48	2,500	2040.83	4.03	7.3	1,977
24.48	3,000	2041.12	4.32	7.7	2,283
24.48	4,000	2041.55	4.75	8.5	2,873
24.48	5,000	2041.94	5.14	9.2	3,448
24.48	6,000	2042.26	5.46	9.7	3,922
24.48	7,000	2042.58	5.78	10.0	4,370
24.48	8,000	2042.83	6.03	10.4	4,811
24.48	9,000	2043.09	6.29	10.7	5,216
24.48	10,000	2043.36	6.56	10.9	5,593
24.48	11,000	2043.56	6.76	11.2	5,970
24.48	12,000	2043.75	6.95	11.5	6,329
24.48	13,000	2043.92	7.12	11.8	6,690
24.48	14,000	2044.11	7.31	12.0	7,021
24.48	15,000	2044.30	7.50	12.2	7,341
24.48	16,000	2044.48	7.68	12.3	7,651
24.48	17,000	2044.66	7.86	12.5	7,955
24.48	18,000	2044.84	8.04	12.6	8,253
24.48	19,000	2045.01	8.21	12.7	8,552
24.48	20,000	2045.18	8.38	12.8	8,841
24.48	21,000	2045.35	8.55	12.9	9,126

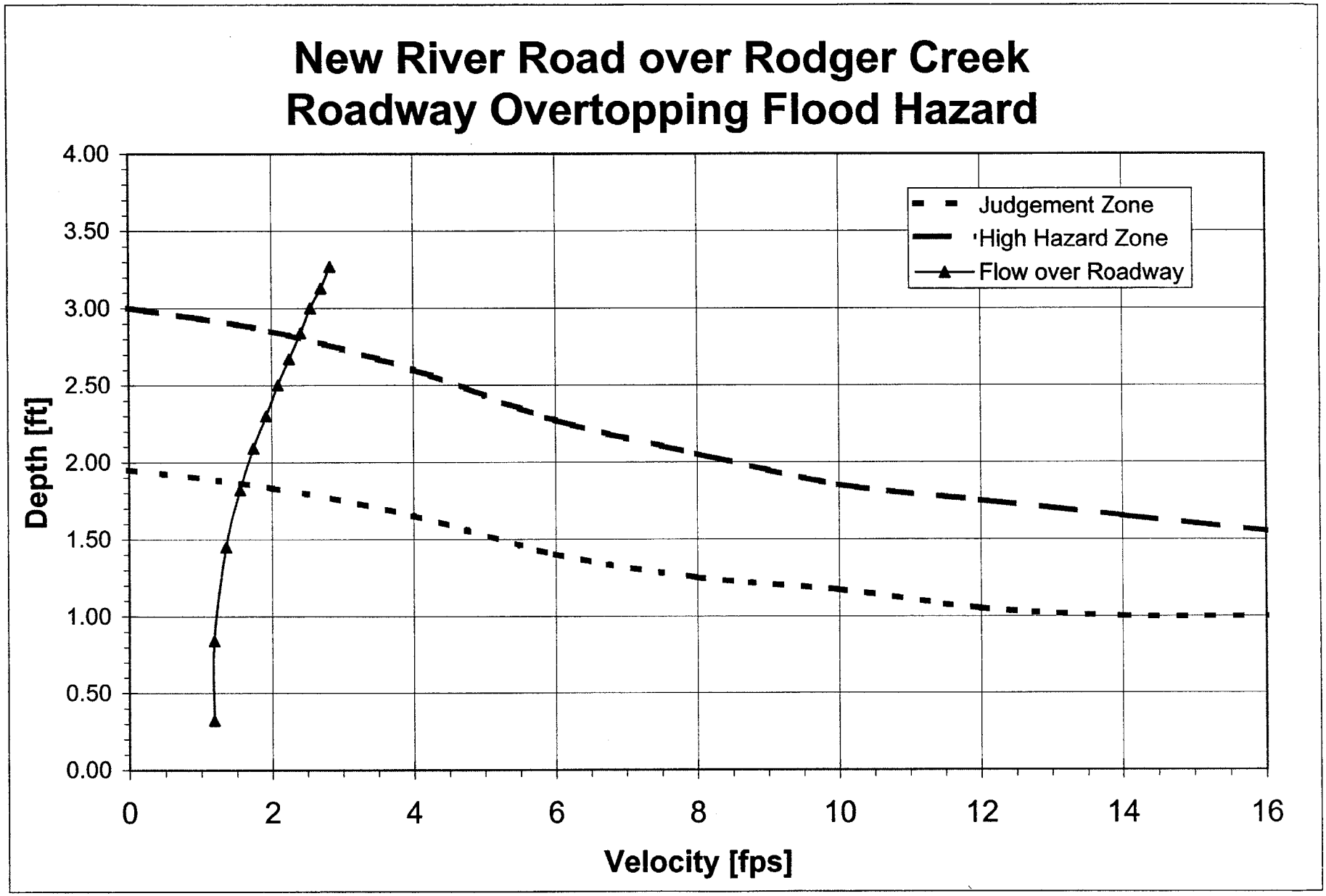

New River Road at Dip North of Bridge
Roadway Overtopping Flood Hazard
Depth [ft]
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
0
2
4
6
8
10
12
14
16
Velocity [fps]
Judgement Zone
High Hazard Zone
Flow over Roadway

Roadway Overtopping Analysis

Graph Data

New River Road at dip north of the bridge
(Manning spreadsheet data)

Q Total (cfs)	Depth (ft)	Velocity (ft/s)	Q Overtop (cfs)
7,954	2.2	5.1	3,705
7,446	2.1	4.9	3,259
7,033	2.0	4.6	2,837
6,565	1.9	4.4	2,438
6,181	1.8	4.1	2,063
5,789	1.7	3.8	1,714
5,378	1.6	3.5	1,392
4,995	1.5	3.2	1,096
4,639	1.4	2.8	830
4,300	1.3	2.5	594
3,989	1.2	2.1	391
3,635	1.1	1.7	223
3,233	1.0	1.2	95
3,000	0.9	0.6	15


New River Road over Rodger Creek
Roadway Overtopping Flood Hazard
Depth [ft]
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
0
2
4
6
8
10
12
14
16
Velocity [fps]
Judgement Zone
High Hazard Zone
Flow over Roadway

Roadway Overtopping Analysis

Graph Data

New River Road over Rodger Creek
(HEC-2 model)

Q Total (cfs)	Depth (ft)	Velocity (ft/s)
1,300	0.32	1.18
1,500	0.84	1.18
2,000	1.45	1.35
2,500	1.82	1.55
3,000	2.09	1.74
3,500	2.30	1.92
4,000	2.50	2.09
4,500	2.67	2.25
5,000	2.84	2.41
5,500	3.00	2.55
6,000	3.13	2.70
6,500	3.27	2.83

APPENDIX E

RECOMMENDED INFORMATION DISSEMINATION OPTION

Skunk Creek WCMP Flood Warning/ Response Plan
OPTION E – NOAA WEATHER RADIO/ PAGER
Overview Information

Products and Services
National Oceanic and Atmospheric Administration (NOAA) Weather Radio Service
NOAA Weather Radios – Radio Shack
Pagers and Group Paging Service – Arch Wireless (formerly PageNet)
Private Vendor Weather Paging Service – I3 Mobile

Contact Information
Steve Waters, FCDMC ALERT Program Manager (602) 506-4694
David Runyan, NWS Meteorologist/ EAS Warning Coordinator (602) 275-7002 x223
Tom Beckett, MCDEM Communications/ Warning Coordinator (602) 273-1411
Mark Rainey - Arch Wireless 1(888) 483-3875
I3 Mobile Customer Service 1(203) 428-3200

Features
- NOAA Weather Radio is currently a NWS warning notification system.
- Phoenix National Weather Service (NWS) office broadcasts weather information 24 hours per day on 162.55 MHz from its transmitter located on South Mountain.
- During severe weather, the routine weather broadcasts are interrupted for special information such as weather warnings.
- FCDMC hydrologists currently monitor ALERT and Unisys data input on a continual basis. Pre-set alarm thresholds trigger heightened awareness on the part of ALERT group personnel.
- FCDMC Meteorological Services Program (MSP) meteorologist is available to interpret weather data.
- FCDMC will establish dialogue with NWS, MCDOT, and MCDEM via telephone or radio when conditions in proximity to and within the Skunk Creek basin warrant.
- MCDEM Duty Officer available 24 hours per day, 7 days per week. MCDEM establishes contact with Maricopa County Sheriff's Office (MCSO).
- MCDOT crews place barricades across roadway dip crossings.
- NWS issues warning messages to the public via:
  - Emergency Alert System (EAS) – consists of radio and television broadcast stations in the Phoenix operational area which voluntarily disseminate emergency information and warnings to the public

- NOAA Weather Radio Service – tone alarm and voice messages received on special weather radios

- FCDMC sends text flood alert messages via pager to residents at risk in the Skunk Creek floodway and floodplain, as appropriate and in the proper sequence, with the NWS flash flood watch and flash flood warning message suite.

- NWS issues flash flood watch and flash flood warning messages via NOAA Weather Radio according to standard protocol using tone alarms followed by voice messages.

- Notification via multiple paths for redundancy:

  - FCDMC pager tone followed by text messages describing nature of flood alert.
  - NWS initiates NOAA Weather Radio tone alarm followed by voice message describing nature of flash flood watch or flash flood warning.
  - OPTIONAL: Weather paging service offered by private vendor automatically dials-up pagers with NWS flash flood watch and flash flood warning messages for a specified area designated by a 6-digit code for Phoenix and Maricopa County.

Warning Message	Alpha Code	Alpha-numeric Code
Flash Flood Watch	PHXFFAPHX	AZZ023
Flash Flood Warning	PHXFFWPHX	AZC013

  - EAS broadcast radio and television flood watch and warning messages (voluntary)
  - Multiple messages possible

- Pagers provides redundancy for weather radio owners.

- Almost instantaneous action time barring system malfunction or interagency communication problems

- Can be implemented on or about August, 2001 given timely procurement of pagers and radios, and fast resolution of interference and/or transmission problems, if any exist.

Cost

- NOAA Weather Radios range in price from $20-$60 each depending on features
- FEMA grant program exists to fund distribution of NOAA radios to floodprone areas
- Pagers - $10.95-13.95 ea. per month for 1-year lease OR $139 to purchase
- Paging Service - ~$3.50 / month/ pager with purchase option only
- Group Paging Service – additional $1.50/ month/ pager
- OPTIONAL Weather Paging Service – additional ~$2/ month/ pager

Considerations

- FCDMC, MCDEM, and NWS will establish in advance warning protocol and message content specific to Skunk Creek for dissemination via NOAA Weather Radio and EAS to minimize time required for message relay

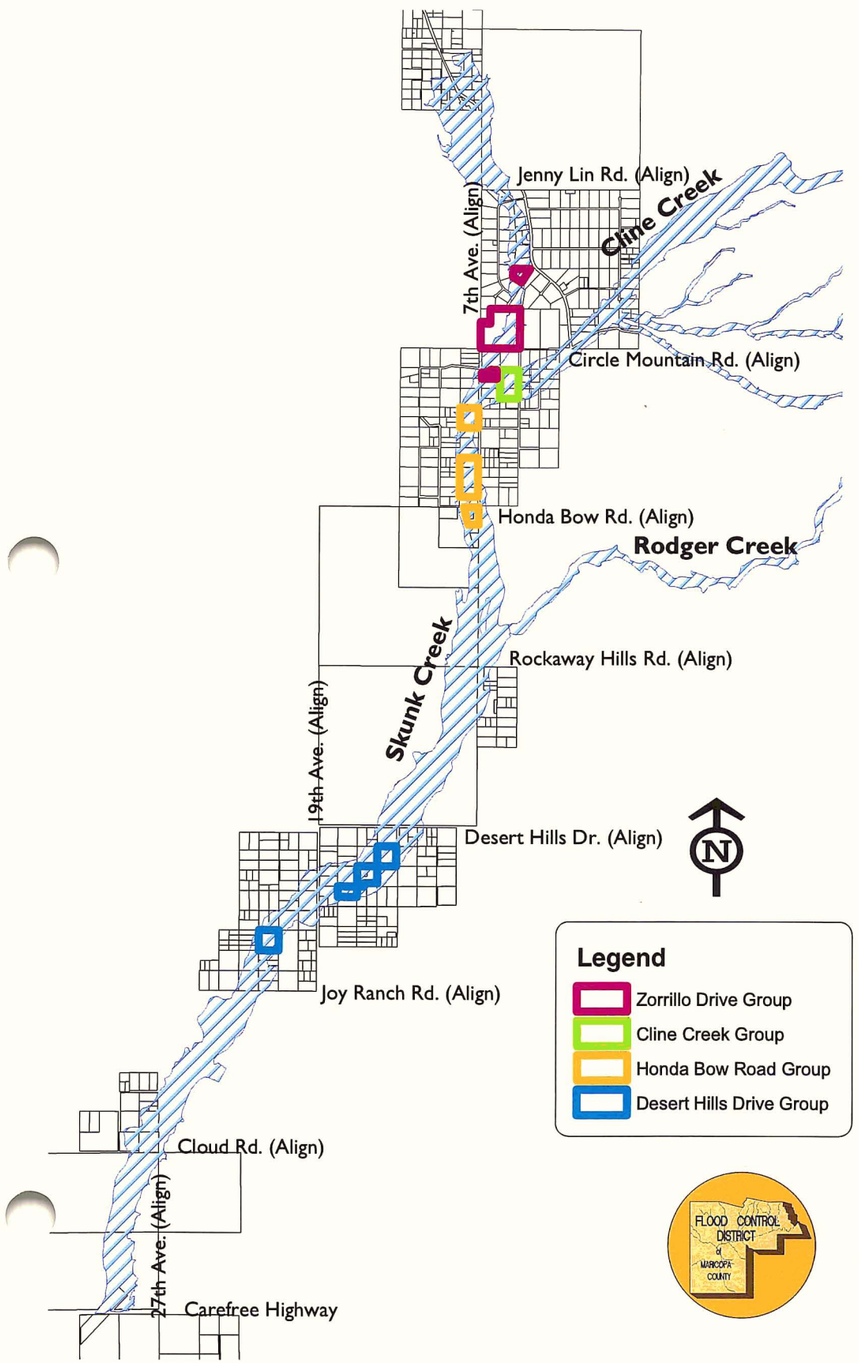
- Meets August, 2001 implementation deadline if timely and successful coordination between FCDMC, MCDEM, and NWS is achieved and timely procurement of equipment is successful.

APPENDIX F

FLOOD RESPONSE PLAN MENUS

SKUNK CREEK FLOOD RESPONSE PLAN

ZORRILLO DRIVE GROUP



MESSAGE	WHAT IT MEANS	WHAT YOU NEED TO DO
(NOAA Radio) National Weather Service Flash Flood Watch (begin time/end time)	→ Flash flooding possible in north central Maricopa County, including Skunk Creek or Cline Creek → Be alert!	→ Monitor your FCDMC pager and NOAA weather radio continually for updates. Other sources of flood information: - Some commercial radio and TV stations voluntarily broadcast NWS flash flood watch and flash flood warning information - Real-time FCDMC rainfall and flood information is always available by monitoring their web page at: http://www.fcd.maricopa.gov/alert/alert.htm - 24-hour hydrologic and weather information for the entire state is available at: http://www.afws.org
(FCDMC Pager) Skunk Creek Message 1 Weather Alert (begin time/end time)	→ Flash flooding possible in north central Maricopa County, especially in the Upper Skunk Creek and Cline Creek areas → Be alert!	
(FCDMC Pager) Skunk Creek Message 2 Flash Flood Alert (begin time/end time)	→ Heavy rainfall detected in upper Skunk or Cline Creeks Watersheds → Moderate flow volumes detected by stream gages → Potential for life-threatening flooding exists → Take necessary precautions!	→ You MAY be instructed to EVACUATE and will need to do so in a moment's notice. You may only have minutes! Get Prepared! → Monitor your FCDMC pager and NOAA weather radio continually for updates. → Locate all residents of your home, pets and livestock. Collect absolute necessities and load in your vehicle(s). Include a flashlight. Secure premises. → Find a light-colored sheet or towel to hang on your doorway in case you evacuate.
(NOAA Radio) National Weather Service Flash Flood Warning (begin time/end time)	→ Flash flooding imminent or occuring in north central Maricopa County, including Skunk Creek or Cline Creek → Take necessary precautions!	
(FCDMC Pager) Skunk Creek Message 3 Severe Flood Warning (effective time/all clear)	→ Extreme rainfall detected in the upper Skunk Creek or Cline Creek watersheds. → Critical flow volumes detected by stream gages. → Severe flash flooding is imminent or occuring. → Many or all of roadway crossings in the area are impassable. → Residents MUST monitor pagers and NOAA weather radios. → Follow the instructions listed under "What You Need To Do"!	→ IMMEDIATELY EVACUATE all residents and pets from your home and get to the evacuation site (see map on reverse). Act quickly! → Turn off lights, heating and air-conditioning units. → Hang a light-colored sheet or towel over your door to indicate to emergency personnel that you have evacuated. → Monitor your FCDMC pager and NOAA weather radio for updates. → Follow the evacuation route shown on the map. Avoid travel on roadways through wash crossings. DO NOT cross any barricaded roads! NEVER drive through flooded roadways, especially at night when dangers are harder to recognize. → Report to evacuation site for registration, even if you do not plan to stay. → Seek medical care at the nearest hospital, if needed. Food, clothing, and first aid may be available from emergency aid organizations such as the Red Cross.
(FCDMC Pager) Skunk Creek Message 4 All Clear (effective time)	→ Floods on Skunk Creek and Cline Creek have dropped below critical levels. → Potential for additional extreme flooding is minimal	→ Leave the evacuation site and return to your home using the same route in reverse. → Use flashlights to examine buildings. Flammables may be inside. → Electrical equipment should be dried and checked before being returned to service.. → Boil drinking water before using. Wells should be pumped out and water tested for purity before drinking. → Throw out any fresh food that has come in contact with flood waters.

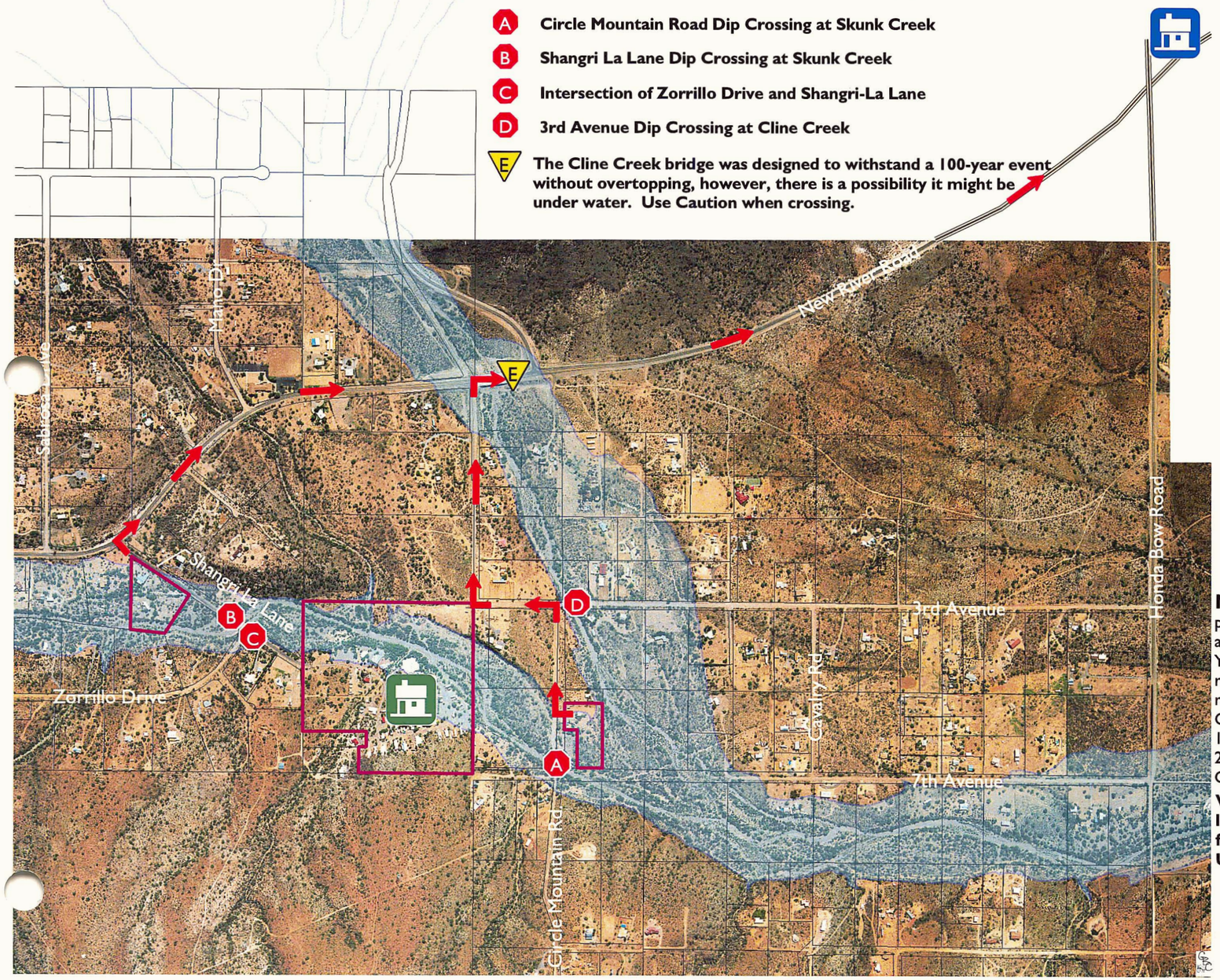
NOTE: The message progression may shortcut to FCDMC Message 3 or 4 at any point in the sequence as evolving flood conditions warrant. If a NWS Flash Flood Watch is in effect early in the day, the warning message sequence may shortcut to NWS Flash Flood Warning, as appropriate to changing weather conditions

SKUNK CREEK FLOOD RESPONSE PLAN

ZORRILLO DRIVE GROUP

POTENTIAL TROUBLE AREAS

- **A** Circle Mountain Road Dip Crossing at Skunk Creek
- **B** Shangri La Lane Dip Crossing at Skunk Creek
- **C** Intersection of Zorrillo Drive and Shangri-La Lane
- **D** 3rd Avenue Dip Crossing at Cline Creek
- **E** The Cline Creek bridge was designed to withstand a 100-year event without overtopping, however, there is a possibility it might be under water. Use Caution when crossing.



EVACUATION ROUTE

Evacuation Site: **Desert Valley Baptist Church**
42425 North New River Road
New River, Arizona 85086
(623) 465-9461

Parry

a. South (Right) on New River Road to Honda Bow Road
b. South (Straight) on New River Road a short distance to Desert Valley Baptist Church on East (Left) Side of New River Road Just South of Honda Bow Road

Sartain

c. East (Right) on Circle Mountain Road to 3rd Avenue
d. North (Left) on 3rd Avenue to Circle Mountain Road
e. East (Right) on Circle Mountain Road to New River Road
f. South (Right) on New River Road to Honda Bow Road
g. South (Straight) on New River Road a short distance to Desert Valley Baptist Church on East (Left) Side of New River Road Just South of Honda Bow Road

Evacuation Route Shangri La Residents Only

Evacuation Site: **Shangri La Main Office**
46834 North Shangri-La Lane
New River, Arizona 85027
(623) 465-5959

Shangri La

a. Evacuate to Shangri La Main Office

NOTE: The Flood Control District of Maricopa County (FCDMC) and National Weather Service (NWS) will provide timely weather information and flood warning messages to you to the best of their abitlity using currently available technology. Be advised that prediction of flash floods is complex and conditions can change very rapidly. You have a responsibility to do what you can to remain alert for changing flood conditions impacting your residence. Closely monitor local conditions around your residence. Use the pager, weather radio, commercial radio, and television to stay informed. You may also contact FCDMC Flood Warning Branch directly for Skunk Creek flood information two ways.

1. Telephone (602) 506-8701
2. Web site http://156.42.96.39/alert/skunk_frp/sc.html

Call 911 if you need emergency assistance during a flood event

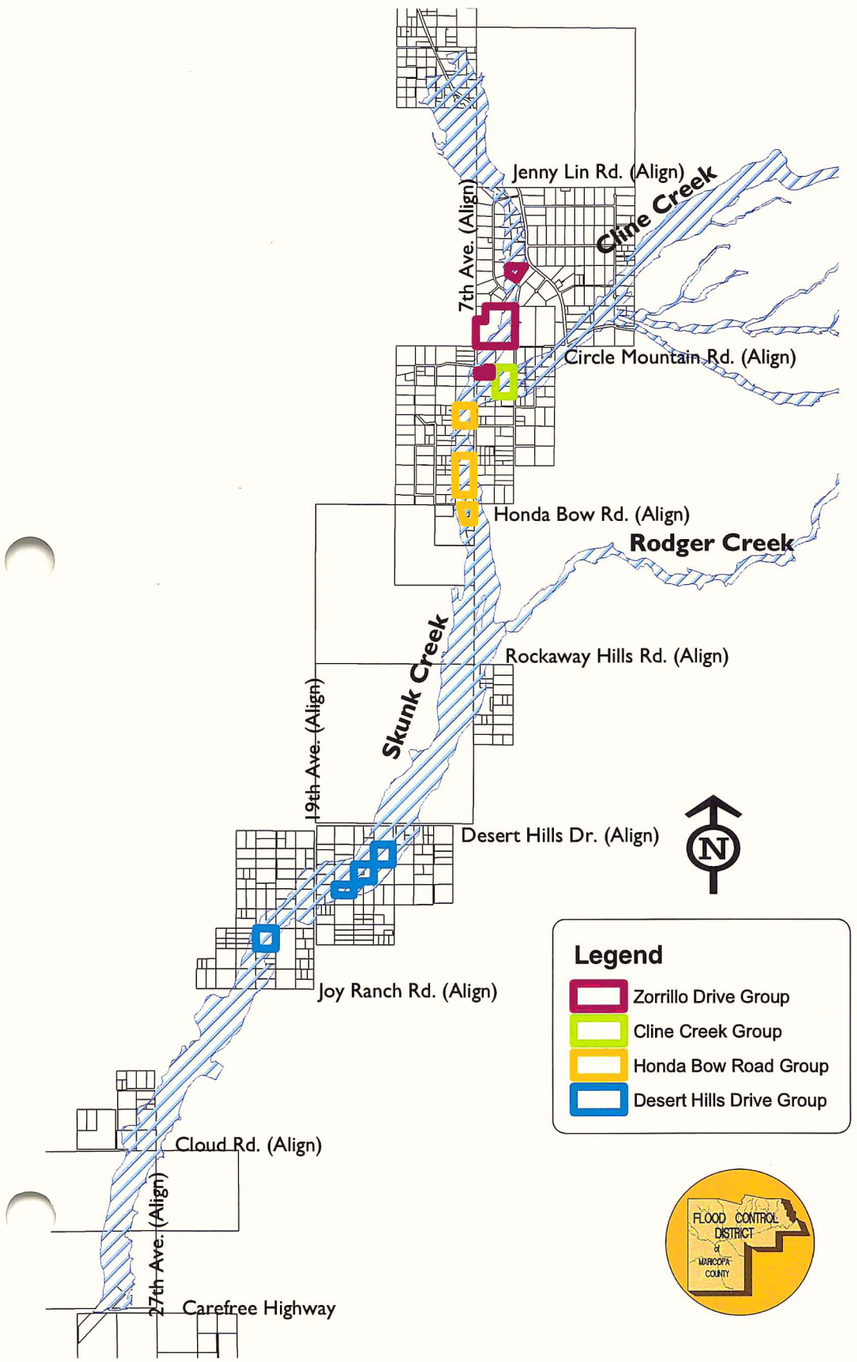
When rainfall increases rapidly or flood conditions worsen significantly, follow the instructions listed under "What You Need To Do" even if you have not received a pager or weather radio flood warning message.
USE COMMON SENSE!

NTS
Aerial Photo Date: 7/1999

FLOOD CONTROL DISTRICT of MARICOPA COUNTY

SKUNK CREEK FLOOD RESPONSE PLAN

CLINE CREEK GROUP



MESSAGE	WHAT IT MEANS	WHAT YOU NEED TO DO
(NOAA Radio) National Weather Service Flash Flood Watch (begin time/end time)	→ Flash flooding possible in north central Maricopa County, including Skunk Creek or Cline Creek → Be alert!	→ Monitor your FCDMC pager and NOAA weather radio continually for updates. Other sources of flood information: - Some commercial radio and TV stations voluntarily broadcast NWS flash flood watch and flash flood warning information - Real-time FCDMC rainfall and flood information is always available by monitoring their web page at: http://www.fcd.maricopa.gov/alert/alert.htm - 24-hour hydrologic and weather information for the entire state is available at: http://www.afws.org
(FCDMC Pager) Skunk Creek Message 1 Weather Alert (begin time/end time)	→ Flash flooding possible in north central Maricopa County, especially in the Upper Skunk Creek and Cline Creek areas → Be alert!	
(FCDMC Pager) Skunk Creek Message 2 Flash Flood Alert (begin time/end time)	→ Heavy rainfall detected in upper Skunk or Cline Creeks Watersheds → Moderate flow volumes detected by stream gages → Potential for life-threatening flooding exists → Take necessary precautions!	→ You MAY be instructed to EVACUATE and will need to do so in a moment's notice. You may only have minutes! Get Prepared! → Monitor your FCDMC pager and NOAA weather radio continually for updates. → Locate all residents of your home, pets and livestock. Collect absolute necessities and load in your vehicle(s). Include a flashlight. Secure premises. → Find a light-colored sheet or towel to hang on your doorway in case you evacuate.
(NOAA Radio) National Weather Service Flash Flood Warning (begin time/end time)	→ Flash flooding imminent or occuring in north central Maricopa County, including Skunk Creek or Cline Creek → Take necessary precautions!	
(FCDMC Pager) Skunk Creek Message 3 Severe Flood Warning (effective time/all clear)	→ Extreme rainfall detected in the upper Skunk Creek or Cline Creek watersheds. → Critical flow volumes detected by stream gages. → Severe flash flooding is imminent or occuring. → Many or all of roadway crossings in the area are impassable. → Residents MUST monitor pagers and NOAA weather radios. → Follow the instructions listed under "What You Need To Do"!	→ IMMEDIATELY EVACUATE all residents and pets from your home and get to the evacuation site (see map on reverse). Act quickly! → Turn off lights, heating and air-conditioning units. → Hang a light-colored sheet or towel over your door to indicate to emergency personnel that you have evacuated. → Monitor your FCDMC pager and NOAA weather radio for updates. → Follow the evacuation route shown on the map. Avoid travel on roadways through wash crossings. DO NOT cross any barricaded roads! NEVER drive through flooded roadways, especially at night when dangers are harder to recognize. → Report to evacuation site for registration, even if you do not plan to stay. → Seek medical care at the nearest hospital, if needed. Food, clothing, and first aid may be available from emergency aid organizations such as the Red Cross.
(FCDMC Pager) Skunk Creek Message 4 All Clear (effective time)	→ Floods on Skunk Creek and Cline Creek have dropped below critical levels. → Potential for additional extreme flooding is minimal	→ Leave the evacuation site and return to your home using the same route in reverse. → Use flashlights to examine buildings. Flammables may be inside. → Electrical equipment should be dried and checked before being returned to service.. → Boil drinking water before using. Wells should be pumped out and water tested for purity before drinking. → Throw out any fresh food that has come in contact with flood waters.

NOTE: The message progression may shortcut to FCDMC Message 3 or 4 at any point in the sequence as evolving flood conditions warrant. If a NWS Flash Flood Watch is in effect early in the day, the warning message sequence may shortcut to NWS Flash Flood Warning, as appropriate to changing weather conditions

SKUNK CREEK FLOOD RESPONSE PLAN

CLINE CREEK GROUP

POTENTIAL TROUBLE AREAS

- (A) Circle Mountain Road Dip Crossing at Skunk Creek
- (B) 3rd Avenue Dip Crossing at Cline Creek
- (C) Use Caution in Dip Crossing on 3rd Avenue between Cavalry Road and Honda Bow Road
- (D) The Cline Creek bridge was designed to withstand a 100-year event without overtopping, however, there is a possibility it might be under water. Use Caution when crossing.

EVACUATION ROUTE

Evacuation Site: **Desert Valley Baptist Church**
42425 North New River Road
New River, Arizona 85086
(623) 465-9461

Selleys/Caldwell

a. South (Right) on 3rd Avenue to Honda Bow Road (USE CAUTION)
b. East (Left) on Honda Bow Road to New River Road
c. South (Right) on New River Road a short distance to Desert Valley Baptist Church on East (Left) Side of New River Road Just South of Honda Bow Road

NOTE: The Flood Control District of Maricopa County (FCDMC) and National Weather Service (NWS) will provide timely weather information and flood warning messages to you to the best of their abitlity using currently available technology. Be advised that prediction of flash floods is complex and conditions can change very rapidly. You have a responsibility to do what you can to remain alert for changing flood conditions impacting your residence. Closely monitor local conditions around your residence. Use the pager, weather radio, commercial radio, and television to stay informed. You may also contact FCDMC Flood Warning Branch directly for Skunk Creek flood information two ways.

1. Telephone (602) 506-8701
2. Web site http://156.42.96.39/alert/skunk_frp/sc.html

Call 911 if you need emergency assistance during a flood event

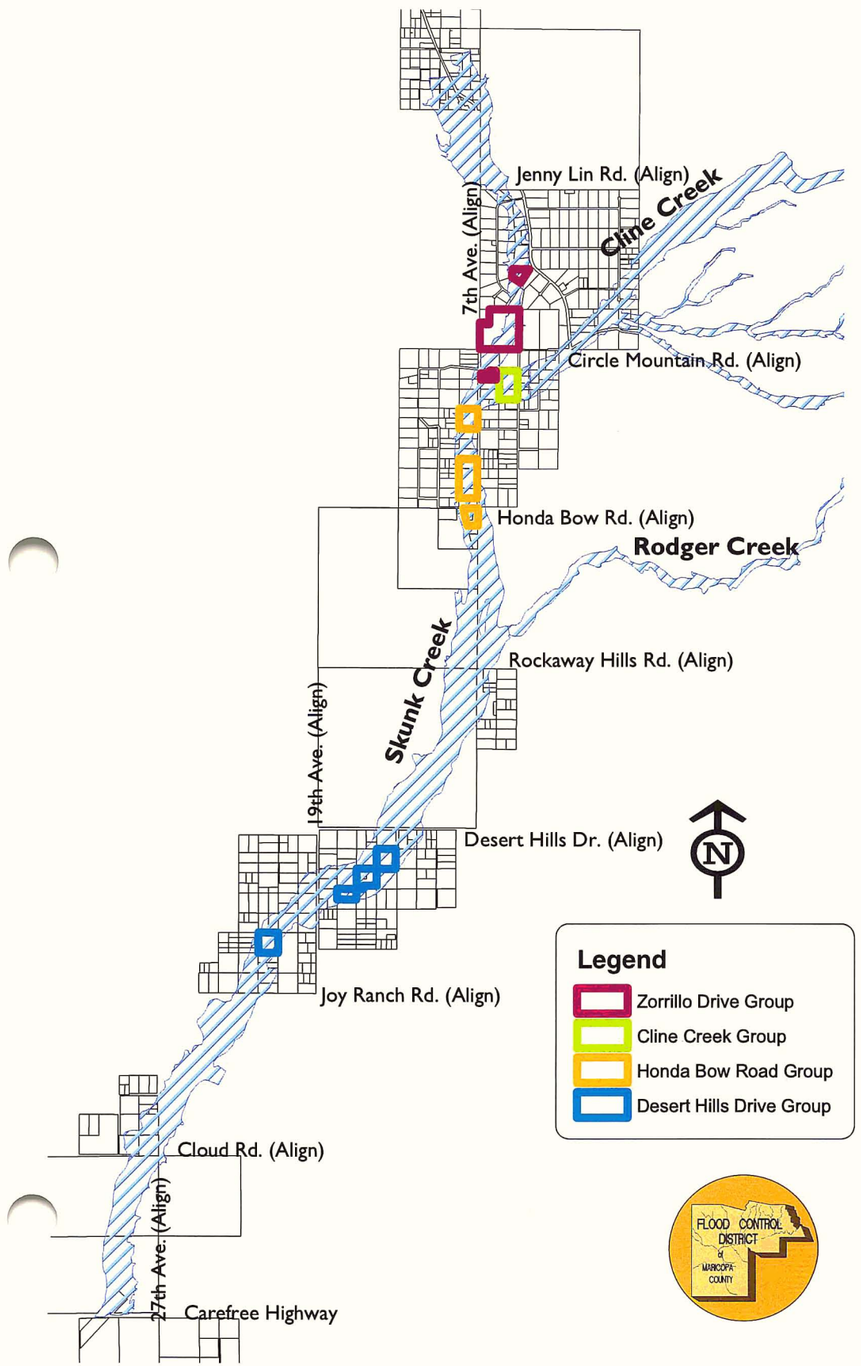
When rainfall increases rapidly or flood conditions worsen significantly, follow the instructions listed under "What You Need To Do" even if you have not received a pager or weather radio flood warning message.
USE COMMON SENSE!

NTS
Aerial Photo Date: 7/1999

FLOOD CONTROL DISTRICT of MARICOPA COUNTY

SKUNK CREEK FLOOD RESPONSE PLAN

HONDA BOW ROAD GROUP



MESSAGE	WHAT IT MEANS	WHAT YOU NEED TO DO
(NOAA Radio) National Weather Service Flash Flood Watch (begin time/end time)	→ Flash flooding possible in north central Maricopa County, including Skunk Creek or Cline Creek → Be alert!	→ Monitor your FCDMC pager and NOAA weather radio continually for updates. Other sources of flood information: - Some commercial radio and TV stations voluntarily broadcast NWS flash flood watch and flash flood warning information - Real-time FCDMC rainfall and flood information is always available by monitoring their web page at: http://www.fcd.maricopa.gov/alert/alert.htm - 24-hour hydrologic and weather information for the entire state is available at: http://www.afws.org
(FCDMC Pager) Skunk Creek Message 1 Weather Alert (begin time/end time)	→ Flash flooding possible in north central Maricopa County, especially in the Upper Skunk Creek and Cline Creek areas → Be alert!	
(FCDMC Pager) Skunk Creek Message 2 Flash Flood Alert (begin time/end time)	→ Heavy rainfall detected in upper Skunk or Cline Creeks Watersheds → Moderate flow volumes detected by stream gages → Potential for life-threatening flooding exists → Take necessary precautions!	→ You MAY be instructed to EVACUATE and will need to do so in a moment's notice. You may only have minutes! Get Prepared! → Monitor your FCDMC pager and NOAA weather radio continually for updates. → Locate all residents of your home, pets and livestock. Collect absolute necessities and load in your vehicle(s). Include a flashlight. Secure premises. → Find a light-colored sheet or towel to hang on your doorway in case you evacuate.
(NOAA Radio) National Weather Service Flash Flood Warning (begin time/end time)	→ Flash flooding imminent or occuring in north central Maricopa County, including Skunk Creek or Cline Creek → Take necessary precautions!	
(FCDMC Pager) Skunk Creek Message 3 Severe Flood Warning (effective time/all clear)	→ Extreme rainfall detected in the upper Skunk Creek or Cline Creek watersheds. → Critical flow volumes detected by stream gages. → Severe flash flooding is imminent or occuring. → Many or all of roadway crossings in the area are impassable. → Residents MUST monitor pagers and NOAA weather radios. → Follow the instructions listed under "What You Need To Do"!	→ IMMEDIATELY EVACUATE all residents and pets from your home and get to the evacuation site (see map on reverse). Act quickly! → Turn off lights, heating and air-conditioning units. → Hang a light-colored sheet or towel over your door to indicate to emergency personnel that you have evacuated. → Monitor your FCDMC pager and NOAA weather radio for updates. → Follow the evacuation route shown on the map. Avoid travel on roadways through wash crossings. DO NOT cross any barricaded roads! NEVER drive through flooded roadways, especially at night when dangers are harder to recognize. → Report to evacuation site for registration, even if you do not plan to stay. → Seek medical care at the nearest hospital, if needed. Food, clothing, and first aid may be available from emergency aid organizations such as the Red Cross.
(FCDMC Pager) Skunk Creek Message 4 All Clear (effective time)	→ Floods on Skunk Creek and Cline Creek have dropped below critical levels. → Potential for additional extreme flooding is minimal	→ Leave the evacuation site and return to your home using the same route in reverse. → Use flashlights to examine buildings. Flammables may be inside. → Electrical equipment should be dried and checked before being returned to service.. → Boil drinking water before using. Wells should be pumped out and water tested for purity before drinking. → Throw out any fresh food that has come in contact with flood waters.

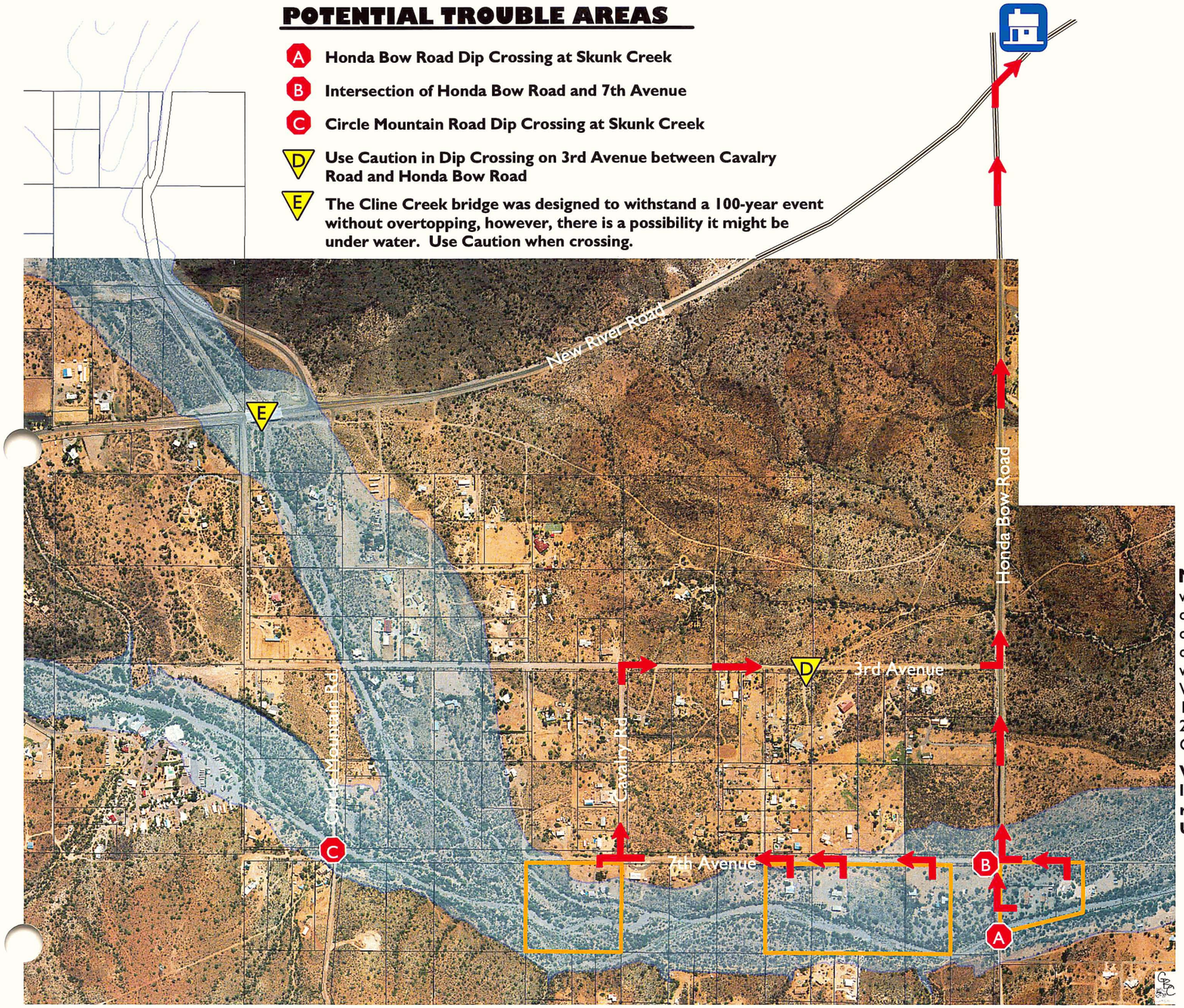
NOTE: The message progression may shortcut to FCDMC Message 3 or 4 at any point in the sequence as evolving flood conditions warrant. If a NWS Flash Flood Watch is in effect early in the day, the warning message sequence may shortcut to NWS Flash Flood Warning, as appropriate to changing weather conditions

SKUNK CREEK FLOOD RESPONSE PLAN

HONDA BOW ROAD GROUP

POTENTIAL TROUBLE AREAS

- **A** Honda Bow Road Dip Crossing at Skunk Creek
- **B** Intersection of Honda Bow Road and 7th Avenue
- **C** Circle Mountain Road Dip Crossing at Skunk Creek
- **D** Use Caution in Dip Crossing on 3rd Avenue between Cavalry Road and Honda Bow Road
- **E** The Cline Creek bridge was designed to withstand a 100-year event without overtopping, however, there is a possibility it might be under water. Use Caution when crossing.



EVACUATION ROUTE

Evacuation Site: **Desert Valley Baptist Church**
42425 North New River Road
New River, Arizona 85086
(623) 465-9461

Albert/Eller/Hines/Funk

a. North (Left) on 7th Avenue to Cavalry Road
b. East (Right) on Cavalry Road to 3rd Avenue
c. South (Right) on 3rd Avenue to Honda Bow Road (USE CAUTION)
d. East (Left) on Honda Bow Road to New River Road
e. South (Right) on New River Road a short distance to Desert Valley Baptist Church on East (Left) Side of New River Road Just South of Honda Bow Road

McKeag/Geraci

f. East (Right) on Honda Bow Road to New River Road
g. South (Right) on New River Road a short distance to Desert Valley Baptist Church on East (Left) Side of New River Road Just South of Honda Bow Road

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2. Web site http://156.42.96.39/alert/skunk_frp/sc.html

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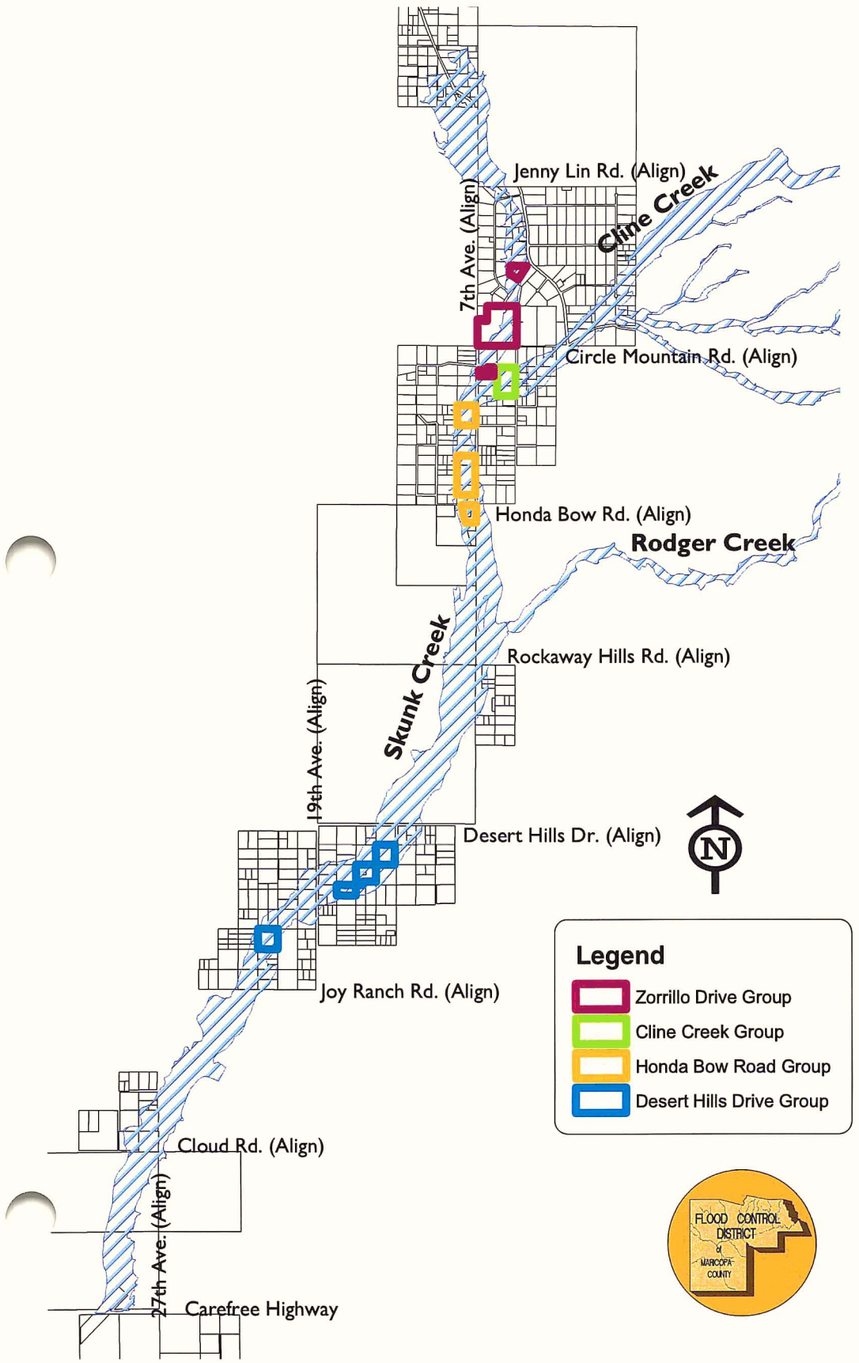
USE COMMON SENSE!

NTS
Aerial Photo Date: 7/1999

FLOOD CONTROL DISTRICT of MARICOPA COUNTY

SKUNK CREEK FLOOD RESPONSE PLAN

DESERT HILLS DRIVE GROUP



MESSAGE	WHAT IT MEANS	WHAT YOU NEED TO DO
(NOAA Radio) National Weather Service Flash Flood Watch (begin time/end time)	→ Flash flooding possible in north central Maricopa County, including Skunk Creek or Cline Creek → Be alert!	→ Monitor your FCDMC pager and NOAA weather radio continually for updates. Other sources of flood information: - Some commercial radio and TV stations voluntarily broadcast NWS flash flood watch and flash flood warning information - Real-time FCDMC rainfall and flood information is always available by monitoring their web page at: http://www.fcd.maricopa.gov/alert/alert.htm - 24-hour hydrologic and weather information for the entire state is available at: http://www.afws.org
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(NOAA Radio) National Weather Service Flash Flood Warning (begin time/end time)	→ Flash flooding imminent or occuring in north central Maricopa County, including Skunk Creek or Cline Creek → Take necessary precautions!	
(FCDMC Pager) Skunk Creek Message 3 Severe Flood Warning (effective time/all clear)	→ Extreme rainfall detected in the upper Skunk Creek or Cline Creek watersheds. → Critical flow volumes detected by stream gages. → Severe flash flooding is imminent or occuring. → Many or all of roadway crossings in the area are impassable. → Residents MUST monitor pagers and NOAA weather radios. → Follow the instructions listed under "What You Need To Do"!	→ IMMEDIATELY EVACUATE all residents and pets from your home and get to the evacuation site (see map on reverse). Act quickly! → Turn off lights, heating and air-conditioning units. → Hang a light-colored sheet or towel over your door to indicate to emergency personnel that you have evacuated. → Monitor your FCDMC pager and NOAA weather radio for updates. → Follow the evacuation route shown on the map. Avoid travel on roadways through wash crossings. DO NOT cross any barricaded roads! NEVER drive through flooded roadways, especially at night when dangers are harder to recognize. → Report to evacuation site for registration, even if you do not plan to stay. → Seek medical care at the nearest hospital, if needed. Food, clothing, and first aid may be available from emergency aid organizations such as the Red Cross.
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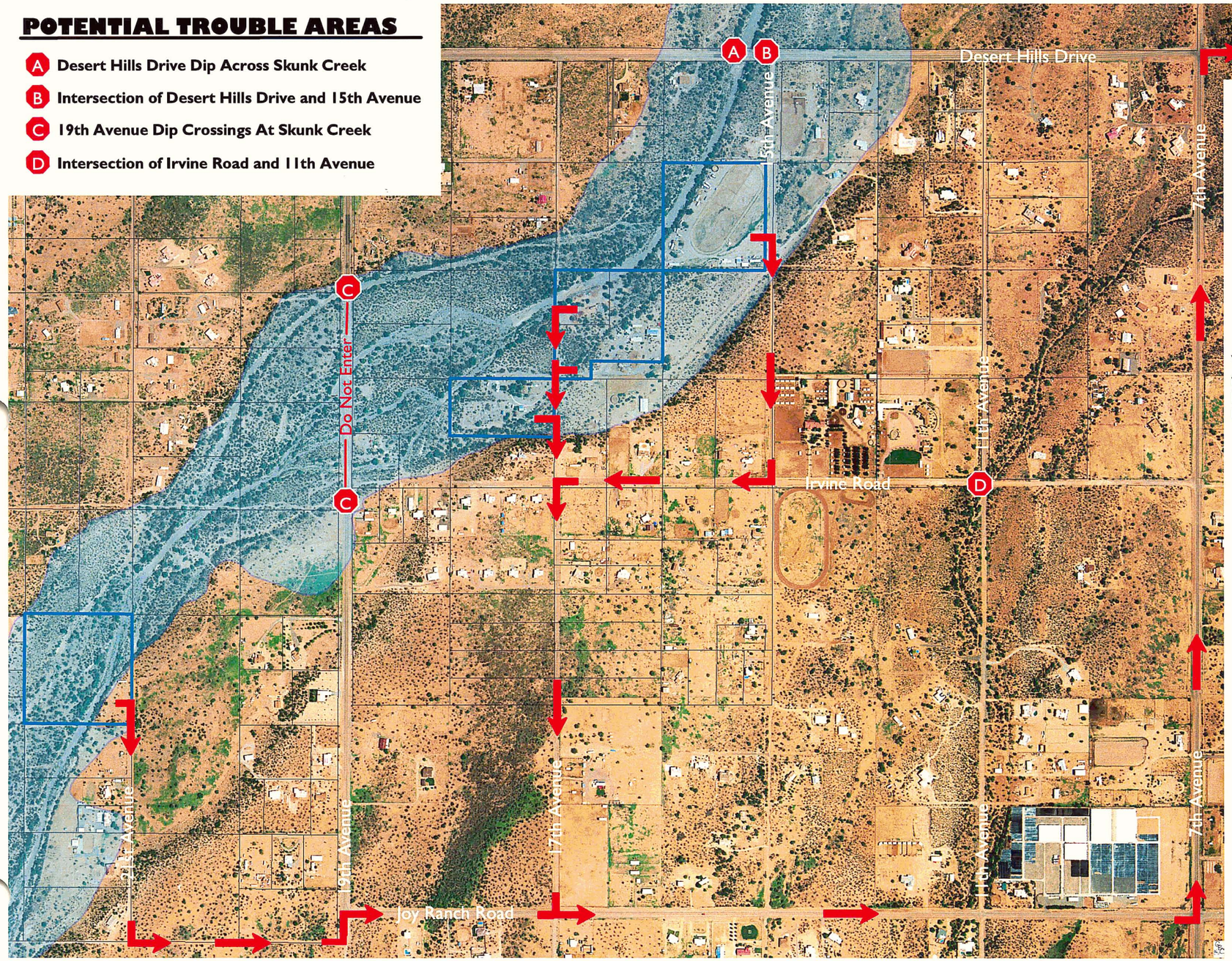
SKUNK CREEK FLOOD RESPONSE PLAN

DESERT HILLS DRIVE GROUP

POTENTIAL TROUBLE AREAS

- **A** Desert Hills Drive Dip Across Skunk Creek
- **B** Intersection of Desert Hills Drive and 15th Avenue
- **C** 19th Avenue Dip Crossings At Skunk Creek
- **D** Intersection of Irvine Road and 11th Avenue



NOTE: The Flood Control District of Maricopa County (FCDMC) and National Weather Service (NWS) will provide timely weather information and flood warning messages to you to the best of their abitlity using currently available technology. Be advised that prediction of flash floods is complex and conditions can change very rapidly. You have a responsibility to do what you can to remain alert for changing flood conditions impacting your residence. Closely monitor local conditions around your residence. Use the pager, weather radio, commercial radio, and television to stay informed. You may also contact FCDMC Flood Warning Branch directly for Skunk Creek flood information two ways.

1. Telephone (602) 506-8701
2. Web site http://156.42.96.39/alert/skunk_frp/sc.html

Call 911 if you need emergency assistance during a flood event

When rainfall increases rapidly or flood conditions worsen significantly, follow the instructions listed under "What You Need To Do" even if you have not received a pager or weather radio flood warning message. USE COMMON SENSE!

EVACUATION ROUTE

Evacuation Site: **Daisy Mountain Fire Department Station**
251 West Desert Hills Drive
Phoenix, Arizona 85086
(623) 465-7400

Hopwood Trust

a. South (Right) on 15th Avenue to Irvine Road
b. West (Right) on Irvine Road to 17th Avenue

Hopwood Trust/Harper/Mathis/Birdsell

c. South (Left) on 17th Avenue to Joy Ranch Road
d. East (Left) on Joy Ranch Road to 7th Avenue
e. North (Left) on 7th Avenue to Desert Hills Drive
f. East (Right) on Desert Hills Drive to Daisy Mountain Fire Station on South (Right) Side of Desert Hills Drive Just West of Central Avenue

Parks

g. South (Right) on 21st Avenue to Joy Ranch Road
h. East (Left) on Joy Ranch Road to 7th Avenue
i. North (Left) on 7th Avenue to Desert Hills Drive
j. East (Right) on Desert Hills Drive to Daisy Mountain Fire Station on South (Right) Side of Desert Hills Drive Just West of Central Avenue

N

NTS

Aerial Photo Date: 7/1999

FLOOD CONTROL DISTRICT of MARICOPA COUNTY

Appendix B

Lists of Property Ownership Information for the WCMP Study Area

APPENDIX B, TABLE B-1
SKUNK CREEK WATERCOURSE MASTER PLAN, PHASES 1 and 2
List of Property Ownership Information Sorted by TAG Number

TAG No. (1)	Assessors's Parcel Number (2)	Assessors's Parcel Area (3)	Name of Owner First (4)	Name of Owner Last (5)	Phone Number (6)	e-mail Address	Mailing Address 1 (7)	Mailing Address 2 (8)	Site Address 1 (9)	Site Adress 2 (10)
1	211 22 003A	478.9		Anthem by Del Webb. Maryanne Kumiega	(623) 742-6107		3701 Anthem Way	Anthem AZ 85086	*No Site Address*	Az
2	211 22 003B	121.2		Anthem by Del Webb. Maryanne Kumiega	(623) 742-6107		3701 Anthem Way	Anthem AZ 85086	*No Site Address*	Az
3	211 22 002L	5.3	Gary M & N R	Schmertmann			6117 W West Wind Dr	Glendale Az 85310	*No Site Address*	Az
4	211 22 002K	25.2								
5	211 22 002B	2.5	James F & Kasey L	McKeag	H (623) 465-5222, cell (602) 743-5338		515 E Carefree Hwy. #311	Phoenix AZ 85085	755 W Honda Bow Rd	New River AZ 85086
6	211 22 002J	3.0	Sharon K	Geraci	H (623) 465-2687, cell (623) 363-1395		PMB, 47515 E. Carefree Hwy	Phoenix AZ 85085	705 W Honda Bow Rd	New River Az 85086
7	211 22 002H	2.0	Sharon K	Geraci	H (623) 465-2687, cell (623) 363-1395		PMB, 47515 E. Carefree Hwy	Phoenix AZ 85085	705 W Honda Bow Rd	New River Az 85086
8	211 22 002F	2.5	Donna M & Ryan	Toon			PO Box 100	Salome Az 85348	*No Site Address*	Az
9	211 86 001	636.6		Anthem by Del Webb. Maryanne Kumiega	(623) 742-6107		3701 Anthem Way	Anthem AZ 85086	*No Site Address*	Az
10	211 73 003S	16.5	Garland	Crews			5035 E North Regency Cir	Tucson Az 85711	40809 N 7Th Ave	Phoenix Az 85027
11	211 73 003X	4.9	Walter G & Dian	Johnson			515 W Rockaway Hills Rd	Phoenix Az 85027	515 W Rockaway Hills Rd	Phoenix Az 85027
12	211 73 005	5.1	Richard S & Vir	Malatin			9445 N 7Th Ave	Phoenix Az 85021	40414 N 3Rd Ave	Phoenix Az 85027
13	211 73 004	4.8	Richard S & Vir	Malatin			9445 N 7Th Ave	Phoenix Az 85021	*No Site Address*	Az
14	211 73 003Z	1.5	MK INT INC				PO Box 41161	Phoenix Az 85080	*No Site Address*	Az
15	211 73 043	1.5	MK INT INC				PO Box 41161	Phoenix Az 85080	*No Site Address*	Az
16	211 73 056	5.2	Jennifer Ann	Browne			422 W Marconi Ave	Phoenix Az 85023	*No Site Address*	Az
17	211 73 057B	2.5	Sharon	Garman			40604 N 3Rd Ave	Phoenix Az 85027	40604 N 3Rd Ave	Phoenix Az 85027
18	211 73 057A	1.2	Patrick Robert	Meenan			PO Box 1363	Carefree Az 85377	*No Site Address*	Az
19	211 73 057C	1.5	William N & Dor	Canfield			PO Box 4362	Cave Creek Az 85327	40600 N 3Rd Ave	Phoenix Az 85027
20	211 73 003U	1.0	Kevin Hastings	Jones			PO Box 145	Cave Creek Az 85327	*No Site Address*	Az
21	211 73 011A	5.0	Kevin H & Lois	Jones			PO Box 145	Cave Creek Az 85327	*No Site Address*	Az
22	211 73 015C	2.0	Garland G	Crews			5035 E North Regency Cir	Tucson Az 85711	506 W Azure Hills Dr	Phoenix Az 85027
23	211 73 015B	1.2	Garland G	Crews			5035 E North Regency Cir	Tucson Az 85711	*No Site Address*	Az
24	211 73 015A	1.5	Garland G	Crews			5035 E North Regency Cir	Tucson Az 85711	*No Site Address*	Az
25	211 73 011B	4.7	Dale A & Lynett	Bohlander			40414 N 3Rd Ave	Phoenix Az 85027	40414 N 3Rd Ave	Phoenix Az 85027
26	211 73 016	5.0	Azar	Corson			4538 W Cinnabar Ave	Glendale Az 85302	*No Site Address*	Az
27	211 73 012	5.2	Ruth G	Rice			2877 Polk Ave	San Diego Ca 92104	*No Site Address*	Az
28	211 73 013	5.0	James J & Judit	Kropid			12 Wild Dunes Ct	Las Vegas Nv 89113	*No Site Address*	Az
29	211 73 003Q	2.6	Michael Robert	Feldman			9971 N 128Th St	Scottsdale Az 85259	*No Site Address*	Az
30	211 73 003R	2.7	James P & Shell	McLaughlin			4343 W Creedance Blvd	Glendale Az 85310	4343 W Creedance Blvd	Glendale Az 85310
31	211 50 034B	9.2	Stanton V & Kay	Weckerly			28681 Walnut Grv	Mission Viejo Ca 92692	*No Site Address*	Az
32	211 50 009G	1.3	Robert L & Lind	Milby Sr.			PO Box 201843	Anchorage Ak 99520	*No Site Address*	Az
33	211 50 009F	1.2	Michael A & Jud	Davis					*No Site Address*	Az
34	211 50 009A	4.5	REEVES UNDERGRO				4738 W Wahalla Ln	Glendale Az 85308	1211 W Desert Hills Dr	Phoenix Az
35	211 50 007A	2.2	Kathleen J	McCartney			PO Box 42642	Phoenix Az 85080	*No Site Address*	Az
36	211 50 007C	4.2	Paul & Marilyn	Nicholson	(623) 465-8710	(623) 465-5064	39019 N. 15th Ave.	Cave Creek Az 85087	39019 N. 15th Ave.	Cave Creek Az 85087
37	211 50 013	8.5	Gerda A & David	Ross			6064 E Snowdon St	Mesa Az 85215	*No Site Address*	Az
38	211 50 012	9.2	Ronald & Phylli	Lee			1725 W Desert Hills Dr	Phoenix Az 85027	1725 W Desert Hills Dr	Phoenix Az 85027
39	211 50 011A	4.5	James H & Phyll	Cherry Jr.			15430 N 30Th St	Phoenix Az 85032	*No Site Address*	Az
40	211 50 011D	3.1	Joe & Shelley	Cantelme			1601 W Desert Hills Dr	Phoenix Az 85027	*No Site Address*	Az
41	211 50 015A	9.0	Jeffery E & Marilynn	Gellerman			22238 N 90Th Ave	Peoria Az 85382	1537 W Desert Hills Dr	Phoenix Az 85027
42	203 31 008A	4.4	Doug D	Ockinga			336 N Elm St	Red Cloud NE 68970	2225 W Desert Hills Dr	Phoenix Az 85027
43	203 31 008B	4.3	Gerald E P & Ro	Pedersen Jr.			Hc 4 1276-B 2215 W Des	Phoenix Az 85027	2215 W Desert Hills Dr	Phoenix Az 85027
44	203 31 012A	4.0	Rosina L	Pedersen					*No Site Address*	Az
45	203 31 001J	1.7	Paul E & Julian	Thiessen			2140 E Michigan Ave #22	Phoenix Az 85022	1731 W Behrend Dr	Phoenix Az 85027
46	203 31 001H	4.6	Terry Lynn	Hollan			PO Box 1294B	Phoenix Az 85001	*No Site Address*	Az
47	203 31 001B	8.2	Hans H & Carol	Zimmerman			828 W Indianola Ave	Phoenix Az 85013	*No Site Address*	Phoenix Az
48	211 50 009D	1.1	James A & Mary	Ivey			1000 Granada Ct	Virginia Beach Va 23456	*No Site Address*	Az
49	211 50 009B	1.2	Kenneth J & Lau	Lawless			5012 W Avalon Dr	Phoenix Az 85031	*No Site Address*	Az
50	211 50 007B	2.2	Ray H & Jean M	Jorgensen			4444 E Wescott Dr	Phoenix Az 85050	39206 N 11Th Ave	Phoenix Az 85027
51	211 50 011C	1.8	Salvatore J & D	Cantelme II			524 W San Juan Ave	Phoenix Az 85013	*No Site Address*	Az
52	203 31 001G	2.2	James V & Linda	Caywood			2005 Arthur St	Wichita Falls Tx 76309	*No Site Address*	Az
53	203 31 012B	5.0	Gerald E & Rosi	Pedersen Jr.					*No Site Address*	Az

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List of Property Ownership Information Sorted by TAG Number

TAG No. (1)	Assessors's Parcel Number (2)	Assessors's Parcel Area (3)	Name of Owner First (4)	Name of Owner Last (5)	Phone Number (6)	e-mail Address	Mailing Address 1 (7)	Mailing Address 2 (8)	Site Address 1 (9)	Site Adress 2 (10)
54	211 50 034F	3.1	Larry J & Sharo	Babcock			102 W Oraibi Dr	Phoenix Az 85027	102 W Oraibi Dr	Phoenix Az 85027
55	211 50 034J	0.5	Rochelle L	Parrish			3902 N 11Th St	Phoenix Az 85014	*No Site Address*	Az
56	211 50 028F	2.8	Richard D & Pat	Boone			3116 E Shea Blvd #236	Phoenix Az 85028	39040 N 11Th Ave	Phoenix Az 85027
57	211 50 021A	2.4	Mark & Ellen	Miraldi			16625 N 34Th Dr	Phoenix Az 85053	*No Site Address*	Az
58	211 50 028E	2.2	Richard D & Pat	Boone			3116 E Shea Blvd #236	Phoenix Az 85028	*No Site Address*	Az
59	211 50 017B	5.0	Ellis & Jean	Lorimor			8005 W Patrick Ln	Peoria Az 85382	Not Available	Az
60	211 50 028C	9.8	David R & Patri	Jones			16024 N 23Rd Pl	Phoenix Az 85022	*No Site Address*	Az
61	211 50 016B	10.0	Joseph P & Elsi	Hsu			3223 Heatherfield Ct	Newbury Park Ca 91320	*No Site Address*	Az
62	211 50 022	9.6	Family Trust	Hopwood			39030 N. 15th Avenue	New River AZ 85086	39030 N 15Th Ave	New River AZ 85086
63	203 31 010A	5.1	Dwight D & Jane	Turmo			4337 W Acoma Dr	Glendale Az 85306	39111 N 24Th St	Phoenix Az 85027
64	203 31 011A	5.2	Gerald E & Rosi	Pedersen Jr.					*No Site Address*	Az
65	203 31 001E	5.0	E Arthur	Patterson			7508 N 13Th Ave	Phoenix Az 85021	*No Site Address*	Az
66	203 31 002A	5.0	Patrick K & Syl	Foley			7952 La Cosa Dr	Dallas Tx 75248	*No Site Address*	Az
67	203 31 002C	2.2	J Michael	Foley			7125 E Lincoln Dr	Scottsdale Az 85253	*No Site Address*	Az
68	211 50 021B	6.7	James B	Theiss			3144 W Pierce St	Phoenix Az 85009	39009 N 19Th Ave	Phoenix Az 85027
69	211 50 034G	3.0	Daniel E & Andr	Brunson			39029 N 11Th Ave	Phoenix Az 85027	39029 N 11Th Ave	Phoenix Az 85027
70	211 50 028B	4.9	Joseph & Adua M	Rotella			5465 N Nottingham Ave	Chicago Il 60656	*No Site Address*	Az
71	211 50 017A	4.8	Billy D & Joan	Mathis			39020 N 17Th Ave	Phoenix Az 85027	39020 N 17Th Ave	Phoenix Az 85027
72	211 50 034H	3.2	Michael H & Kay	Reed			7245 E Jenan Dr	Scottsdale Az 85260	39019 N 11Th Ave	Phoenix Az 85027
73	203 31 001F	4.8	James L & Cynth	Trikoff			39013 N 21St Ave	Phoenix Az 85027	39021 N 21St Ave	Phoenix Az 85027
74	N/A	0.4								
75	203 31 011B	5.1	Gerald E & Rosi	Pedersen Jr.					*No Site Address*	Az
76	203 31 010B	5.0	Dwight D & Jane	Turmo			4337 W Acoma Dr	Glendale Az 85306	*No Site Address*	Az
77	203 31 002D	2.2	Patrick K	Foley			7952 La Cosa Dr	Dallas Tx 75248	*No Site Address*	Az
78	211 50 026A	9.9	Lawrence Arthur	Lee			38827 N 11Th Ave	Phoenix Az 85027	38827 N 11Th Ave	Phoenix Az 85027
79	211 50 026E	2.5	Joseph & Auda M	Rotella			5465 N Nottingham Ave	Chicago Il 60656	*No Site Address*	Az
80	211 50 026C	2.5	Gary Lawrence &	Lee			38838 N 11Th Ave	Phoenix Az 85027	38833 N 11Th Ave	Phoenix Az 85027
81	211 50 025	9.9	John W & Sheila	Barto II			5523 W Park View Ln	Glendale Az 85310	*No Site Address*	Az
82	211 50 016E	4.5	David J	McHenry			PO Box 9356	Phoenix Az 85068	1718 W Maryland Ave	Phoenix Az 85015
83	211 50 024	9.8	J	Anthony			485 Glencastle Dr Nw	Atlanta Ga 30327	*No Site Address*	Az
84	211 50 016J	6.5	Willis E	Harper			38821 N 17Th Ave	New River Az 85027	*No Site Address*	Az
85	211 50 023	10.4	Gerald E & Shar	Pearson			5230 W Fallen Leaf Ln	Glendale Az 85310	*No Site Address*	Az
86	203 31 009E	1.9	David	Bealer			38909 N 23Rd Ave	Phoenix Az 85027	38909 N 23Rd Ave	Phoenix Az 85027
87	203 31 009H	1.6	Darin L	Deherrera			4337 W Acoma Dr	Glendale Az 85306	4337 W Acoma Dr	Glendale Az 85306
88	203 31 009G	1.7	James F & Dana	Frandrup			3406 W Acoma Dr	Phoenix Az 85053	3406 W Acoma Dr	Phoenix Az 85053
89	203 31 004A	7.3								
90	203 31 006A	4.9	Karen W	Spencer			7119 E Bellingham Dr	Tucson Az 85730	38800 N 21St Ave	Phoenix Az 85027
91	203 31 013A	4.7	Clifford P & Ro	Jennings			220 W Bell Rd #1011	Phoenix Az 85023	39000 N 19Th Ave	Phoenix Az 85027
92	211 50 016D	4.6	David J	McHenry			PO Box 9356	Phoenix Az 85068	1718 W Maryland Ave	Phoenix Az 85015
93	211 50 026F	5.0	Ronald W	Raper			22207 N 90Th Ave	Peoria Az 85382	38822 N 11Th Ave	Phoenix Az 85027
94	203 31 009C	2.5	James A & Cynth	Tullis			38815 N 23Rd Ave	Phoenix Az 85027	38815 N 23Rd Ave	Phoenix Az 85027
95	203 31 009D	2.5	Daniel R & Sher	Kibler Sr.			3507 W Carefree Hwy	Phoenix Az 85027	38805 N 23Rd Ave	Phoenix Az 85027
96	203 31 013B	4.7	Joyce	Barker			15852 Cliff Ave	White Rock	*No Site Address*	Az
97	203 31 006B	5.0	Steven B & Juli	Parizek			PO Box 41398	Phoenix Az 85080	38811 N 21St Ave	Phoenix Az 85027
98	211 50 016F	1.1	Willis E	Harper			38821 N 17Th Ave	New River Az 85027	*No Site Address*	Az
99	203 31 004D	1.4	Mary L	Vasquez			9122 N Cave Creek Rd	Phoenix Az 85020	38808 N 21St Ave	Phoenix Az 85027
100	203 31 004C	1.5	Judith A & Guad	Romero			PO Box 2142	Carefree Az 85377	*No Site Address*	Az
101	211 50 029	8.7	Daniel Brian &	Diaz			PO Box 1374	Phoenix Az 85001	38625 N 17Th Ave	Phoenix Az 85027
102	211 50 018	10.0	Paul A & Marily	Nicholson	(623) 465-8710		609 Pass Creek Rd	Parkman Wy 82838	1148 W Irvine Rd	Phoenix Az 85027
103	211 50 015B	7.1	DESERT HILLS IN				PO Box 4071	Springfield Mo 65808	*No Site Address*	Az
104	211 50 037C	5.2	Tim & Tammy R	Mathis	(623) 465-8731	timandtam@qwest.net	38640 N 17Th Ave	New River, AZ 85086	38640 N 17Th Ave	New River, AZ 85086
105	211 50 027	9.9	Lee R & Sharon	Hilton			1440 W Irvine Rd	Phoenix Az 85027	1440 W Irvine Rd	Phoenix Az 85027
106	211 50 020F	4.9	Warren R & Cand	Read			1632 W Irvine Rd	Phoenix Az 85027	1632 W Irvine Rd	Phoenix Az 85027

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107	211 50 020C	5.3	Curtis J & Mari	Masters			1610 W Irvine Rd	Phoenix Az 85027	1632 W Irvine Rd	Phoenix Az 85027
108	211 50 019B	5.0	TMN LIMITED PAR				5830 W Del Lago Cir	Glendale Az 85308	1538 W Erwin Rd	Az
109	211 50 019A	5.4	L P	Tmn					*No Site Address*	Az
110	203 31 014A	5.1	Shawn	Heath			625 S Westwood #175	Mesa Az 85210	38605 N 23Rd Ave	Phoenix Az 85027
111	203 31 014B	4.9	Corydon Michael	Cooley			PO Box 2080	Show Low Az 85902	*No Site Address*	Az
112	203 31 007B	5.1	Coyden & Patric	Cooley			PO Box 2080	Show Low Az 85902	*No Site Address*	Az
113	203 31 007A	5.0	Odette Marie	Fuller			PO Box 400	Whiteriver Az 85941	*No Site Address*	Az
114	203 31 005A	5.1	Raymond D & Nan	Lawhorn			38715 N 21St Ave #1	Phoenix Az 85027	38715 N 21St Ave #1	Phoenix Az 85027
115	203 31 003	9.2	James W & Robin	Gavin			1111 E Stella Ln	Phoenix Az 85014	*No Site Address*	Az
116	211 50 015C	2.2		DESERT HILLS INESTMENT CO LLC			PO Box 4071	Springfield Mo 65808	*No Site Address*	Az
117	211 50 037D	4.6	Edwin Eugene &	Hospelhorn			24432 N 89Th Ave	Peoria Az 85382	*No Site Address*	Az
118	203 31 005B	4.9	Eugene V	Murray			507 Cherry Ln	Glenview Il 60025	38615 N 23Rd Ave	Phoenix Az 85027
119	211 50 030C	1.3	Larry G & Debra	Lambertus			1837 W Irvine Rd	Phoenix Az 85027	1837 W Irvine Rd	Phoenix Az 85027
120	211 50 030E	1.1	Tamara L	Solem			PO Box 5055	Carefree Az 85377	*No Site Address*	Az
121	211 50 030F	1.2	Donald A & Joan	Pryor			7810 N Via De La Sombre	Scottsdale Az 85258	7810 N Via De La Sombre	Scottsdale Az 85258
122	211 50 030D	1.1	Joseph H & Cath	Bowers			1829 W Irvine Rd	Phoenix Az 85027	1829 W Irvine Rd	Phoenix Az 85027
123	211 50 008	9.6								
124	211 50 032A	7.7	Daniel W	Twitchell Jr.			1535 W Irvine Rd	Phoenix Az 85027	1535 W Irvine Rd	Phoenix Az 85027
125	211 50 014J	2.4	Newton & Barbar	Burk			1619 W Irvine Rd	Phoenix Az 85027	1619 W Irvine Rd	Phoenix Az 85027
126	211 50 014H	2.5								
127	203 32 008J	1.3	Mario V & Jean	Giorda			272 Meadowview Dr	Torrington Ct 06790	2243 W Irvine Rd	Phoenix Az 85027
128	203 32 008H	1.2	David J & Donna	Manthey			5730 W Glenrosa Ave	Phoenix Az 85031	2233 W Irvine Rd	Phoenix Az 85027
129	203 32 008G	2.3	George & Jane M	Huntley			20257 N 10Th Ave	Phoenix Az 85027	20257 N 10Th Ave	Phoenix Az 85027
130	203 32 010B	4.9	Wyona B & Alva	Kimbrel			1529 W Desert Cv	Phoenix Az 85029	2137 W Irvine Rd	Phoenix Az 85027
131	203 32 010A	4.9	Michael Lee & L	Collins			326 W Topeka Dr	Phoenix Az 85027	*No Site Address*	Az
132	203 32 007	9.8	Richard L	Belveal					*No Site Address*	Az
133	203 32 018	9.0								
134	211 50 014D	1.2	James R	Bliss			38425 N 17Th Ave	Phoenix Az 85027	38425 N 17Th Ave	Phoenix Az 85027
135	211 50 014F	1.2	William C & Jac	McGriff			501 W Sequoia Dr	Phoenix Az 85027	*No Site Address*	Az
136	211 50 032B	2.6	Michael W	Thompson			38405 N 16Th Ave	Phoenix Az 85027	38405 N 16Th Ave	Phoenix Az 85027
137	211 50 030A	4.3	Timothy K & Cyn	Miller			240 E Helena Dr	Phoenix Az 85022	38405 N 19Th Ave	Phoenix Az 85027
138	203 32 008E	5.0	J Michael	Foley			7125 E Lincoln Dr	Scottsdale Az 85253	*No Site Address*	Az
139	211 50 014E	1.3	Robert Dean & D	Bado			38407 N 17Th Ave	Phoenix Az 85027	38407 N 17Th Ave	Phoenix Az 85027
140	211 50 014G	1.4	William C & Jac	McGriff Sr.			9232 N 2Nd Ave	Phoenix Az 85021	38405 N 17Th Ave	Phoenix Az 85027
141	211 50 041	9.4	Hans H & Carol	Zimmerman			828 W Indianola Ave	Phoenix Az 85013	*No Site Address*	Az
142	211 50 003A	2.6	Michael Frankli	Ryan			905 Martinez St	San Diego Ca 92106	*No Site Address*	Az
143	211 50 003J	2.6	Anita Margaret	Evenson			2445 Brant St #501	San Diego Ca 92101	*No Site Address*	Az
144	211 50 048K	4.3	Family Trust	Hamby			PO Box 1387	Phoenix Az 85001	*No Site Address*	Az
145	203 33 001Y	1.3	Paul D	Cook			PO Box 41103	Phoenix Az 85080	38348 N 23Rd Ave	Phoenix Az 85027
146	203 32 014C	2.6	Bobby G & Cathy	Rhudy			38245 N 23Rd Ave	Phoenix Az 85027	38245 N 23Rd Ave	Phoenix Az 85027
147	203 33 001Q	2.6	Dale J & Cheryl	Reinhold			4404 W Chama Dr	Glendale Az 85310	4404 W Chama Dr	Glendale Az 85310
148	203 32 006	10.2	Patricia E	Parks			3002 W Muriel Dr	Phoenix Az 85053	38210 N 21St Ave	Phoenix Az 85027
149	203 32 001A	20.3	Richard L	Belveal			12915 Foxglove Dr Nw	Gig Harbor Wa 98332	*No Site Address*	Az
150	203 32 013F	2.0	Alan Joseph	Caylor			38252 N 19Th Ave	Phoenix Az 85027	38252 N 19Th Ave	Phoenix Az 85027
151	203 32 013E	2.6	Billy D & Glady	Caylor			PO Box 1969	Cave Creek Az 85327	*No Site Address*	Az
152	211 50 003M	2.6	Anita Margaret	Evenson			2445 Brant St #501	San Diego Ca 92101	*No Site Address*	Az
153	211 50 003L	2.5	Michael Frankli	Ryan			905 Martinez St	San Diego Ca 92106	*No Site Address*	Az
154	211 50 048L	1.1	Darrin Ray & De	Hamby			8650 N 35Th Ave #109	Phoenix Az 85051	*No Site Address*	Az
155	203 33 001Z	1.3	Paul & Yescavag	Cook			PO Box 41103	Phoenix Az 85080	*No Site Address*	Az
156	203 32 014D	2.6	Leland E	Mathis			PO Box 1268	Phoenix Az 85001	*No Site Address*	Az
157	211 50 048E	1.4	Delbert K & Kri	Skinner			38207 N 16Th St	Phoenix Az 85027	38214 N 15Th Ave	Phoenix Az 85027
158	211 50 048F	1.3	Delbert K & Kri	Skinner			38207 N 16Th St	Phoenix Az 85027	38216 N 15Th Ave	Phoenix Az 85027
159	211 50 048H	1.3	Sue Carol	Fyke			2123 W Surrey Ave	Phoenix Az 85029	*No Site Address*	Az

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160	211 50 048J	1.3	Delbert K & Kri	Skinner II			2156 W Wickieup Ln	Phoenix Az 85027	38207 N 16Th Ave	Phoenix Az 85027
161	211 50 003K	2.5	Jeannette Marjo	Evenson			2445 Brant St #501	San Diego Ca 92101	*No Site Address*	Az
162	211 50 003C	2.5	Amy Anne	Ryan			340 San Gorgonio St	San Diego Ca 92106	*No Site Address*	Az
163	203 33 017	1.3	Scott W & Tamar	Bruske			38215 N 24Th Ave	Phoenix Az 85027	38215 N 24Th Ave	85027 Az
164	203 33 001U	1.3	Joseph H & Mari	Meier			926 Cleveland St #A212	Greenville Sc 29601	*No Site Address*	Az
165	203 32 014F	2.5	Jonathan	Wohl			PO Box 1269	Phoenix Az 85001	*No Site Address*	Az
166	203 32 013D	2.5	James E	Dekarske			7162 N 56Th Ave #A	Glendale Az 85301	38222 N 19Th Ave	Phoenix Az 85027
167	203 32 013C	2.2	Rodney Wayne	Beeman			40043 N 7Th St	Phoenix Az 85027	40043 N 7Th St	Phoenix Az 85027
168	211 50 003N	2.4	Amy Anne	Ryan			340 San Gorgonio St	San Diego Ca 92106	*No Site Address*	Az
169	211 50 003P	2.5	Jeannette Major	Evenson			2445 Brant St #501	San Diego Ca 92101	*No Site Address*	Az
170	203 33 018	1.3	Terry M & Susan	McIver Jr.			38211 N 24Th Ave	Phoenix Az 85027	38211 N 24Th Ave	85027 Az
171	203 33 001V	1.3	David E & Lilli	Meintel			38204 N 23Rd Ave	Phoenix Az 85027	38204 N 23Rd Ave	Phoenix Az 85027
172	203 32 014E	2.5	Tim E & Patti L	Atchley			PO Box 1269	Phoenix Az 85001	*No Site Address*	Az
173	203 33 010	10.1	Family Trust	Beck			11295 N 99Th Ave #521	Peoria Az 85345	*No Site Address*	Az
174	203 32 002	10.1	N ARIZ FOUNDATI				206 S Hinton	Scottsdale Az 85251	*No Site Address*	Az
175	203 32 005C	4.9	Margaret H	Melvin	(623) 465-7922		38026 N 21St Ave	Phoenix Az 85027	*No Site Address*	Az
176	203 32 012F	3.3	Barbara L	Fair					*No Site Address*	Az
177	203 32 012E	1.3	Donald P & Barb	Maggiore			38106 N 19Th Ave	Phoenix Az 85027	38106 N 19Th Ave	Phoenix Az 85027
178	203 32 005D	3.9	Margaret H	Melvin			PO Box 1382-K	Phoenix Az 85001	38026 N 21St Ave	Phoenix Az 85027
179	203 33 008C	2.4	Robert & Adele	Girmendonk			38025 N 25Th Ave	Phoenix Az 85027	38025 N 25Th Ave	Phoenix Az 85027
180	203 33 008F	1.2	Barry	Rechtorovich			402 E Coral Gables Dr	Phoenix Az 85022	*No Site Address*	Az
181	203 33 008E	1.1	Francine L	Freitag			38015 N 25Th Ave	Phoenix Az 85027	38015 N 25Th Ave	Phoenix Az 85027
182	203 32 012G	1.2	Robert L & Judi	Cascio			PO Box 4215	Cave Creek Az 85327	*No Site Address*	Az
183	203 32 012H	2.2	Donnie	Drake			PO Box 5525	Carefree Az 85377	*No Site Address*	Az
184	203 32 012C	1.3	Michael	Grootegoed			38018 N 19Th Ave	Phoenix Az 85027	38018 N 19Th Ave	Phoenix Az 85027
185	203 32 005B	1.3	Robert J & Diane L.	Damer			37906 N 21St Ave	New River, AZ 85086	37906 N 21St Ave	New River, AZ 85086
186	203 33 004	10.1	Norman E & Meli	Childress			2324 W Joy Ranch Rd	Phoenix Az 85027	2324 W Joy Ranch Rd	Phoenix Az 85027
187	203 32 004	10.1	L L C	Slac			38624 N 7Th Ave	Phoenix Az 85027	*No Site Address*	Az
188	203 33 003B	4.9	Mark L & Caroly	Shockey			3742 W Yorkshire Dr	Glendale Az 85308	*No Site Address*	Az
189	203 33 003A	5.0								
190	203 32 003B	5.1	Arline	Damer			PO Box 1382	Phoenix Az 85001	37906 N 21St Ave	Phoenix Az 85027
191	203 32 011	10.1	Dallas D	Thorn			945 N Pasadena #51	Mesa Az 85201	*No Site Address*	Az
192	203 32 009D	1.5	John A & Beverl	Abbink			8540 W Avenida Del Sol	Peoria Az 85382	37834 N 19Th Ave	Phoenix Az 85027
193	203 32 009C	1.5	Arthur T & Jane	Skaggs			8510 W Avenida Del Sol	Peoria Az 85382	37832 N 19Th Ave	Phoenix Az 85027
194	203 32 009E	1.6	Randall W & Fel	Clark			8510 W Avenida Del Sol	Peoria Az 85382	37828 N 19Th Ave	Phoenix Az 85027
195	203 32 003A	5.0	Robert D & Maud	Knox			PO Box 4830	Cave Creek Az 85327	*No Site Address*	Az
196	203 32 009B	4.5	John T & John T	Lindholtz Sr.			1721 E Winter Dr	Phoenix Az 85020	*No Site Address*	Az
197	203 38 001P	3.6	Jason	McClure			2145 W Williams Dr	Phoenix Az 85027	2145 W Williams Dr	Phoenix Az 85027
198	203 38 001N	4.5	ITOW FAMILY LIM				2145 W Williams Dr	Phoenix Az 85027	36827 N 27Th Ave	Phoenix Az 85027
199	203 38 007	4.5	Joann K	Jones			2513 Via De Pallon Cir	Henderson Nv 89014	*No Site Address*	Az
200	203 38 008C	2.3	Solomon O & Pri	Muniz			10734 W Laurelwood Ln	Avondale Az 85323	*No Site Address*	Az
201	203 38 008A	1.1	Solomon O & Pri	Muniz			10734 W Laurelwood Ln	Avondale Az 85323	*No Site Address*	Az
202	203 38 008B	1.4	Solomon O & Pri	Muniz			10734 W Laurelwood Ln	Avondale Az 85323	36841 N 29Th Ave	Phoenix Az 85027
203	203 38 001F	4.1	Emery & Frankie	Brown			11611 N 50Th Ave	Glendale Az 85304	*No Site Address*	Az
204	203 38 001E	8.6	Clifford L & Je	Dwyer			4319 W Ocotillo Rd	Glendale Az 85301	*No Site Address*	Az
205	203 38 001S	3.4	Roland & Betty	Dahl			8808 N 106Th Ln	Peoria Az 85345	*No Site Address*	Az
206	203 38 001R	1.2	Mark A & Betty	Dail			8808 N 106Th Ln	Peoria Az 85345	36616 N 27Th Ave	Phoenix Az 85027
207	203 38 006	10.4	Ernestine G	Carey			701 W Herbert Ave #64	Reedley Ca 93654	*No Site Address*	Az
208	203 38 005	9.9	Ernestine G	Carey			701 W Herbert Ave #64	Reedley Ca 93654	*No Site Address*	Az
209	203 38 010C	5.1	Holdings L L C	Feldman			3200 N Central Ave #700	Phoenix Az 85012	*No Site Address*	Az
210	203 38 010E	5.4	Holdings L L C	Feldman			3200 N Central Ave #700	Phoenix Az 85012	*No Site Address*	Az
211	203 38 010D	28.3	Ira S & Susan B	Feldman			3200 N Central Ave #700	Phoenix Az 85012	*No Site Address*	Az
212	203 38 004	10.3	Anna Harris	Ingber			4220 Colfax Ave #115	Studio City Ca 91604	*No Site Address*	Az

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213	203 38 009A	9.5	Battista J & Ma	Blessent			2526 E Elm St	Phoenix Az 85016	*No Site Address*	Az
214	203 25 001B	166.5		TRAMONTO DEVELO			5343 N 16Th St #460	Phoenix Az 85016	*No Site Address*	Phoenix Az
215	203 26 001	320.9		TRAMONTO DEVELO			5343 N 16Th St #460	Phoenix Az 85016	*No Site Address*	Phoenix Az
216	203 26 002	292.4		TRAMONTO DEVELO			5343 N 16Th St #460	Phoenix Az 85016	3310 W Carefree Hwy	Phoenix Az
217	204 02 001E	68.9		CANYON INVESTORS			11411 N Tatum Blvd	Phoenix Az 85028	*No Site Address*	Phoenix Az
218	204 02 003A	80.4	Azar	Azar			3623 E Windmere Dr	Phoenix Az 85044	*No Site Address*	Phoenix Az
219	204 02 001D	8.9		CANYON INVESTORS					*No Site Address*	Phoenix Az
220	204 01 005A	39.7	Family L L C	Kramer			5550 N Yucca Rd	Paradise Valley Az 85253	*No Site Address*	Phoenix Az
221	204 01 006L	10.2	David J	McHenry			PO Box 9356	Phoenix Az 85068	*No Site Address*	Phoenix Az
222	204 01 006G	20.7	David J	McHenry			PO Box 9356	Phoenix Az 85068	*No Site Address*	Phoenix Az
223	204 02 001C	2.3		CANYON INVESTORS			11411 N Tatum Blvd	Phoenix Az 85028	*No Site Address*	Phoenix Az
224	204 01 006F	9.1	David J	McHenry			PO Box 9356	Phoenix Az 85068	*No Site Address*	Phoenix Az
225		0.4								
226	204 01 006H	18.4	David J	McHenry			PO Box 9356	Phoenix Az 85068	*No Site Address*	Phoenix Az
227	204 01 004B	40.5	Azar	Farahmand			3623 E Windmere Dr	Phoenix Az 85044	*No Site Address*	Phoenix Az
228	204 01 006J	10.0	David J	McHenry			PO Box 9356	Phoenix Az 85068	*No Site Address*	Phoenix Az
229	204 01 006K	10.2	David J	McHenry			PO Box 9356	Phoenix Az 85068	*No Site Address*	Phoenix Az
230	204 01 007	40.3	Azar	Farahmand			3623 E Windmere Dr	Phoenix Az 85044	*No Site Address*	Phoenix Az
231	204 01 003	40.6	Azar	Farahmand			3623 E Windmere Dr	Phoenix Az 85044	*No Site Address*	Phoenix Az
232	204 02 002B	79.7		CANYON INVESTORS			11411 N Tatum Blvd	Phoenix Az 85028	*No Site Address*	Phoenix Az
233	204 02 002A	80.2		CANYON INVESTORS			11411 N Tatum Blvd	Phoenix Az 85028	*No Site Address*	Phoenix Az
234	204 02 004	121.9		BAHA PROPERTIES			4207 E Palo Verde Dr	Phoenix Az 85018	*No Site Address*	Phoenix Az
235	204 01 002	40.1	Family L L C	Kramer			5550 N Yucca Rd	Paradise Valley Az 85253	*No Site Address*	Phoenix Az
236	204 01 001	80.3	Family L L C	Kramer			5550 N Yucca Rd	Paradise Valley Az 85253	*No Site Address*	Phoenix Az
237	211 25 001	320.1		SECURITY TITLE AG			3620 N 3Rd Ave	Phoenix Az 85013	*No Site Address*	Phoenix Az
238	204 12 002	160.9		SECURITY TITLE AG			3620 N 3Rd Ave	Phoenix Az 85013	*No Site Address*	Phoenix Az
239	204 11 001M	2.8	Asaad Ahmad E	Alsaad			PO Box 69	Safat	*No Site Address*	Phoenix Az
240	204 11 001L	2.9	Albert & Janice	Vaninetti			9058 N 40Th Dr	Phoenix Az 85051	*No Site Address*	Phoenix Az
241	204 11 001K	2.7	Jerry A & Don Mat	Brookshire			2832 E Phelps Rd	Phoenix Az 85032	*No Site Address*	Phoenix Az
242	204 11 001J	2.6	Richard J & Nancy	Llanes			2410 W Keim Dr	Phoenix Az 85015	*No Site Address*	Phoenix Az
243	204 11 001N	54.3	Ventires Llc	Britmet			2390 E Camelback Rd #438	Phoenix Az 85016	*No Site Address*	Phoenix Az
244	204 11 002D	30.2	Dds Gordon L	Hardy			7600 E Camelback Rd # 4	Scottsdale Az 85251	*No Site Address*	Phoenix Az
245		0.4								
246	204 11 002F	19.9	John E & Susan L	Propst			PO Box 41513	Phoenix Az 85080	*No Site Address*	Phoenix Az
247	204 11 002E	29.0	Dds Nicholas P	Bazioles			7600 E Camelback Rd #3	Scottsdale Az 85251	*No Site Address*	Phoenix Az
248	204 11 001P	15.0	Tiffany				6535 N Arizona Biltmore	Phoenix Az 85016	*No Site Address*	Phoenix Az
249	204 12 001	160.2		SECURITY TITLE AG			3620 N 3Rd Ave	Phoenix Az 85013	*No Site Address*	Phoenix Az
250	204 12 003	162.0		SECURITY TITLE AG			3620 N 3Rd Ave	Phoenix Az 85013	*No Site Address*	Phoenix Az
251	204 11 001C	39.9	Thomas C	Law III			7505 E 6Th Ave #100	Scottsdale Az 85251	*No Site Address*	Phoenix Az
252	204 11 002G	39.9	Ronald & Sue	Cheuvront			3334 E Sells Dr	Phoenix Az 85018	*No Site Address*	Phoenix Az
253	204 11 001F	10.2	Salvatore & Rita	Riccardi			141 Malone Ave	Staten Island Ny 10306	*No Site Address*	Phoenix Az
254	204 11 002K	10.3		LONE MOUNTAIN ROA			2312 W Northern Ave	Phoenix Az 85021	*No Site Address*	Phoenix Az
255	204 11 002L	10.1		LONE MOUNTAIN ROA			2312 W Northern Ave	Phoenix Az 85021	*No Site Address*	Phoenix Az
256	204 11 001E	29.9	Salvatore & Rita	Riccardi			141 Malone Ave	Staten Island Ny 10306	*No Site Address*	Phoenix Az
257	204 11 002J	20.2		LONE MOUNTAIN ROA			2312 W Northern Ave	Phoenix Az 85021	*No Site Address*	Phoenix Az
258	204 13 001J	10.2	William B & Eva D	Koors			818 W Butler Dr	Phoenix Az 85021	*No Site Address*	Phoenix Az
259	204 13 001T	70.4	The	Novak Family Llc			7050 NW Grand Ave	Glendale Az 85301	*No Site Address*	Phoenix Az
260	204 13 001N	10.9	THOMAS W & JOYCE						*No Site Address*	Phoenix Az
261	204 13 001Q	5.7	Thomas R & Doris	Thomas R & Doris			5866 N Echo Canyon Ln	Phoenix Az 85018	*No Site Address*	Phoenix Az
262	204 13 001S	2.6	THOMAS W & JOYCE						*No Site Address*	Phoenix Az
263	204 13 003A	40.3		ROTH INVESTMENT P			3232 Cobb Pkwy #315	Atlanta Ga 30339	*No Site Address*	Phoenix Az
264	204 13 003C	41.0		DESERT BISCUIT FL			4434 E Camelback Rd #134	Phoenix Az 85018	*No Site Address*	Phoenix Az
265	204 13 001H	8.7	William B & Eva D	Koors			818 W Butler Dr	Phoenix Az 85021	*No Site Address*	Phoenix Az

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266	204 13 001R	3.0	Thomas W & Claudi	Gamble			3454 Kimberly Rd	Cameron Park Ca 95682	*No Site Address*	Phoenix Az
267	204 13 001F	9.4	Jose M I & Alice	Sanchez			6628 N 16Th Dr	Phoenix Az 85015	*No Site Address*	Phoenix Az
268	204 13 001G	9.1	Patrick J & Lorra	Evans			2872 Coast Cir #301	Huntington Beach Ca 92649	*No Site Address*	Phoenix Az
269	204 13 001U	29.7		NOVAK FAMILY L L			7050 NW Grand Ave	Glendale Az 85301	*No Site Address*	Phoenix Az
270	204 13 003B	39.3		NOVAK FAMILY LLC			PO Box 5805	Carefree Az 85377	*No Site Address*	Phoenix Az
271	204 13 003A	39.9		ROTH INVESTMENT P			3232 Cobb Pkwy #315	Atlanta Ga 30339	*No Site Address*	Phoenix Az
272	204 13 004H	68.2		MADISON GRANITE S			PO Box 5805	Carefree Az 85377	*No Site Address*	Phoenix Az
273	204 13 004G	4.8		LANDMARK AMERICAN			4990 Austell Powder Spri	Austell Ga 30106	*No Site Address*	Phoenix Az
274	204 13 004D	5.2		LANDMARK AMERICAN			4990 Austell Powder Spri	Austell Ga 30106	*No Site Address*	Phoenix Az
275	204 13 002A	119.1		PLATEAU VENTURES			201 Sheridan Rd	Kenilworth Il 60043	*No Site Address*	Phoenix Az
276	204 13 002B	40.2		ROTH INVESTMENT P			3232 Cobb Pkwy #315	Atlanta Ga 30339	*No Site Address*	Phoenix Az
277	204 13 004F	10.0		MADISON GRANITE S			PO Box 5805	Carefree Az 85377	*No Site Address*	Phoenix Az
278	204 13 004E	19.0	Family L L C	Kramer			5550 N Yucca Rd	Paradise Valley Az 85253	*No Site Address*	Phoenix Az
279	204 13 004J	47.6		MADISON GRANITE S			PO Box 5805	Carefree Az 85377	*No Site Address*	Phoenix Az
280	204 13 004K	2.3		MADISON GRANITE S			PO Box 5805	Carefree Az 85377	*No Site Address*	Phoenix Az
281		1.1								
282	204 24 004A	29.1		CHI CONSTRUCTION			7001 N Scottsdale Rd #20	Scottsdale Az 85253	*No Site Address*	Phoenix Az
283	204 24 001	81.6	North	Phoenix L P			3232 Cobb Pkwy #315	Atlanta Ga 30339	*No Site Address*	Phoenix Az
284		1.7								
285	204 24 002C	15.5					PO Box 31699	Phoenix Az 85046	*No Site Address*	Phoenix Az
286	204 24 006E	48.7		L-MAR INVESTMENT			3232 Cobb Pkwy #315	Atlanta Ga 30339	*No Site Address*	Phoenix Az
287	204 23 011	77.7		L-MAR INVESTMENT			3232 Cobb Pkwy #315	Atlanta Ga 30339	*No Site Address*	Phoenix Az
288	204 23 004	36.7		HARRIS BLACK CANY			6263 N Scottsdale Rd #10	Scottsdale Az 85250	*No Site Address*	Phoenix Az
289	204 23 012	41.8	Olie E	Swanky			5216 N 45Th Pl	Phoenix Az 85018	*No Site Address*	Phoenix Az
290	204 24 002B	14.8	John R & Silvia R	Fleitz			1517 W Libby St	Phoenix Az 85023	*No Site Address*	Phoenix Az
291	204 24 004B	50.3		FIRST AMERICAN TI			111 W Monroe St	Phoenix Az 85003	*No Site Address*	Phoenix Az
292	204 24 002J	4.3	Richard J & Nancy	Llanes			2410 W Keim Dr	Phoenix Az 85015	*No Site Address*	Phoenix Az
293	204 24 002H	4.6	Richard J & Nancy	Llanes			2410 W Keim Dr	Phoenix Az 85015	*No Site Address*	Phoenix Az
294	204 24 002G	9.5	Randy F & Marlene	Berger			PO Box 142	Newton Ut 84327	*No Site Address*	Phoenix Az
295	204 23 010	40.2		UNITED STATES OF			201 N Central Ave #2200	Phoenix Az 85073	*No Site Address*	Phoenix Az
296	204 23 005E	14.9		AUSTRALIAN NATIVE			29035 N Black Canyon Hwy	Phoenix Az 85027	*No Site Address*	Phoenix Az
297	204 23 006A	20.5		HARRIS BLACK CANY			6263 N Scottsdale Rd #10	Scottsdale Az 85250	*No Site Address*	Phoenix Az
298	204 23 002B	20.0		ARIZONA LAND INCO			2999 N 44Th St #100	Phoenix Az 85018	*No Site Address*	Phoenix Az
299	204 24 006F	10.4		UNITED STATES OF			3707 N 7Th St	Phoenix Az 85014	*No Site Address*	Phoenix Az
300	204 24 002F	9.7		DYNAMITE 45 PROPE			10225 W Thunderbird Blvd	Sun City Az 85351	*No Site Address*	Phoenix Az
301	204 24 006D	13.7		UNITED STATES OF			135 N 2Nd Ave	Phoenix Az 85003	*No Site Address*	Phoenix Az
302	204 23 005G	1.5		U S BUREAU OF REC			135 N 2Nd Ave	Phoenix Az 85003	*No Site Address*	Phoenix Az
303	204 24 002K	9.4		DYNAMITE 45 PROPE			10225 W Thunderbird Blvd	Sun City Az 85351	*No Site Address*	Phoenix Az
304	204 24 006B	9.6		UNITED STATES OF			8336 E Cypress St	Scottsdale Az 85257	*No Site Address*	Phoenix Az
305	204 23 006C	20.9	George	Pingitore			36622 N Lazy Ln	Carefree Az 85377	*No Site Address*	Phoenix Az
306	204 23 005D	8.0		U S BUREAU OF REC			135 N 2Nd Ave	Phoenix Az 85003	*No Site Address*	Phoenix Az
307	204 23 005F	4.0		U S BUREAU OF REC			135 N 2Nd Ave	Phoenix Az 85003	*No Site Address*	Phoenix Az
308	204 23 002D	9.9	David D	Jarvis			151 Fraser Ave	Santa Monica Ca 90405	*No Site Address*	Phoenix Az
309	204 23 002C	10.3	David D	Jarvis			151 Fraser Ave	Santa Monica Ca 90405	*No Site Address*	Phoenix Az
310	204 24 002L	9.4	Richard J & Nancy	Llanes			2410 W Keim Dr	Phoenix Az 85015	*No Site Address*	Phoenix Az
311	204 23 006B	1.2	George	George			36622 N Lazy Ln	Carefree Az 85377	*No Site Address*	Phoenix Az
312	204 24 003D	46.7		CHI CONSTRUCTION			7001 N Scottsdale Rd #20	Scottsdale Az 85253	*No Site Address*	Phoenix Az
313	204 24 003J	10.1		CHI CONSTRUCTION			7001 N Scottsdale Rd #20	Scottsdale Az 85253	*No Site Address*	Phoenix Az
314	204 24 003M	10.2		CHI CONSTRUCTION			7001 N Scottsdale Rd #20	Scottsdale Az 85253	*No Site Address*	Phoenix Az
315	204 24 005P	16.7		U S BUREAU OF REC			2410 W Keim Dr	Phoenix Az 85015	*No Site Address*	Phoenix Az
316	204 24 005N	3.0		U S BUREAU OF REC			201 N Central Ave #2200	Phoenix Az 85073	*No Site Address*	Phoenix Az
317	204 24 005M	38.3		UNITED STATES OF			201 N Central Ave #2200	Phoenix Az 85073	*No Site Address*	Phoenix Az
318	204 24 005T	48.9		WESTTREND DYNAMIT			PO Box 9686	Scottsdale Az 85252	*No Site Address*	Phoenix Az

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319	204 23 009R	53.0		INTERSTATE 17 INV			3232 Cobb Pkwy #315	Atlanta Ga 30339	*No Site Address*	Phoenix Az
320	204 23 009N	7.9		UNITED STATES OF			201 N Central Ave #2200	Phoenix Az 85073	*No Site Address*	Phoenix Az
321	204 23 009E	48.9		Crimmins Family Trust					*No Site Address*	Phoenix Az
322	204 23 009G	5.9		ABAR PROPERTIES L			1707 E Highland Ave #190	Phoenix Az 85016	*No Site Address*	Phoenix Az
323	204 23 009F	28.5		ABAR PROPERTIES L			1707 E Highland Ave #190	Phoenix Az 85016	*No Site Address*	Phoenix Az
324	204 23 009W	1.0		Crimmins Family Trust					*No Site Address*	Phoenix Az
325	204 23 009V	10.0		Crimmins Family Trust					*No Site Address*	Phoenix Az
326	204 24 003L	12.7		CHI CONSTRUCTION			7001 N Scottsdale Rd #20	Scottsdale Az 85253	*No Site Address*	Phoenix Az
327		1.2								
328	204 24 005R	4.7		DYNAMITE 45 PROPE			10225 W Thunderbird Blvd	Sun City Az 85351	*No Site Address*	Phoenix Az
329	204 23 009T	29.9		MARICOPA COUNTY F			3335 W Durango St	Phoenix Az 85009	*No Site Address*	Phoenix Az
330	204 24 005Q	12.0	Patrick F & Ellen	Anderson			502 W Wood Dr	Phoenix Az 85029	*No Site Address*	Phoenix Az
331	204 23 009S	23.1	Minnesota	Minnesota Title & Trust			3232 Cobb Pkwy #315	Atlanta Ga 30339	*No Site Address*	Phoenix Az
332	204 23 009U	92.9		Crimmins Family Trust					*No Site Address*	Phoenix Az
333	204 24 005F	14.9		CHI CONSTRUCTION			7001 N Scottsdale Rd #20	Scottsdale Az 85253	*No Site Address*	Phoenix Az
334	204 24 003F	65.4		CHI CONSTRUCTION			7001 N Scottsdale Rd #20	Scottsdale Az 85253	*No Site Address*	Phoenix Az
335	204 24 003H	10.1	Bullington Jr.	Bullington Jr.			3409 W Claremont St	Phoenix Az 85017	*No Site Address*	Phoenix Az
336	204 24 005S	16.7		MARICOPA COUNTY F			3335 W Durango St	Phoenix Az 85009	*No Site Address*	Phoenix Az
337	204 24 003G	4.4		UNITED STATES OF			PO Box 9980	Phoenix Az 85068	*No Site Address*	Phoenix Az
338	204 23 009D	1.5	Jackson A & Merce	Mason			1138 E Northview Ave	Phoenix Az 85020	*No Site Address*	Phoenix Az
339	204 23 001	3.9		PRESCOTT VALLEY C			PO Box 26494	Prescott Valley Az 86312	28210 N 27Th Ave	Phoenix Az
340	202 07 004A	5.7		Rogers Climith W;Grace W Tr					*No Site Address*	Az
341	202 07 004C	3.8		Bayly Shawn J					*No Site Address*	Az
342	202 07 004E	4.9		Sahr Tommie A;Deette					49015 N 3Rd Ave	Phoenix Az 85027
343	202 07 004F	4.7		Wright Jeffrey;Mary					210 W Mingus Rd	Phoenix Az 85027
344	202 07 005D	3.8		Neely David L;Sherri L					445 W County Rd	Az
345	202 07 005M	5.7		Harris Thomas John					49240 N 3Rd Ave	Phoenix Az 85027
346	202 07 005N	4.7		Nielson Robert L;Ann M					49229 N 7Th Ave	Phoenix Az 85027
347	202 07 005P	4.7		Iben Pennie K					49214 N 3Rd Ave	Phoenix Az 85027
348	202 07 005S	1.0		Jennings Barbara Victoria					49213 N 7Th Ave	New River Az 85027
349	202 07 005U	0.9		Dean Linda K;Via Wilton C					49011 N 7Th Ave	Phoenix Az 85027
350	202 07 005W	1.4		Hines Jason P;Susan J					514 W Mingus Rd	Az
351	202 07 005Z	1.3		Palmer Charles W;Valeri A					49119 N 7Th Ave	Phoenix Az 85027
352	202 07 006C	2.2		Peet Steven G;Patricia B					*No Site Address*	Az
353	202 07 006D	2.3		Sharp Jessie E Jr;Joanna					*No Site Address*	Az
354	202 07 006F	2.0		Lamprecht Michael E;Sally A					3025 W New River Rd #1	Phoenix Az 85027
355	202 07 006G	0.9		Meyer Edward A;Sandra L Tr					*No Site Address*	Az
356	202 07 006J	3.9		Meyer Edward A;Sandra L Tr					49227 N 3Rd Ave	Phoenix Az 85027
357	202 07 006L	2.9		Mcmaster David Wayne					*No Site Address*	Az
358	202 07 006M	2.4		Borowski Bradly;Stephanie Sheets					49215 N 3Rd Ave #New	Phoenix Az 85027
359	202 07 006N	1.0		Leiler Robert Gale					49226 N 1St Ave	Phoenix Az 85027
360	202 07 006P	1.1		Lann Nellie Yvonne					49224 N 1St Ave	Phoenix Az 85027
361	202 07 007E	5.4		Wright Robert T;Margaret G					49610 N 4Th Ave	New River Az 85027
362	202 07 007F	3.1		Pond Thomas A Jr					49643 N 7Th Ave	Phoenix Az 85027
363	202 07 007G	2.5		White Robert P					49615 N 4Th Ave	New River Az 85027
364	202 07 007H	4.9		Harris Thomas John					*No Site Address*	Az
365	202 07 007J	4.8		Fowler Sr Albert F;Demetra F					49459 N 7Th Ave	Phoenix Az 85027
366	202 07 007K	7.3		Roberts Latetia					4942 N 7Th Ave	Phoenix Az 85013
367	202 07 007L	2.3		Marti Katrina A					49451 N 7Th Ave	Phoenix Az 85027
368	202 07 008C	5.3		Swanson William;Agnes					49625 N 5Th Ave	New River Az 85027
369	202 07 008D	2.6		Nicholson Paul J;Nancy L					*No Site Address*	Az
370	202 07 008E	2.3		Nicholson Paul J;Nancy L					*No Site Address*	Az
371	202 07 009C	10.3		Marti Katrina A					49451 N 7Th Ave	Phoenix Az 85027

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372	202 07 009D	4.4		Nicoloff Nicholas A;Mary Ann					49440 N Central Ave	New River Az 85027
373	202 07 009E	4.8		Stitzer Iv Arthur B					49428 N Central Ave	Phoenix Az 85027
374	202 07 009F	5.8		Daniel Thomas M;Maria H					49440 N 2Nd Ave	Phoenix Az 85027
375	202 07 009G	14.2		Blakely Pauline					*No Site Address*	Az
376	202 07 010	8.7		Hegre Adolf;Malene;Mary;Anderson James L					49012 N 3Rd Ave	New River Az 85027
377	202 07 011	2.9		Whitelaw James W;Jodi L					*No Site Address*	Az
378	202 07 012	2.7		Akerson Irene					49239 N 7Th Ave	Phoenix Az 85027
379	202 07 N/A	2.1								
380	202 08 001A	5.1		Mason G Elly					*No Site Address*	Az
381	202 08 001C	4.8		Mason G Elly					*No Site Address*	Az
382	202 08 002A	1.1		Mclellan Donald Charles;Marlene K					*No Site Address*	Az
383	202 08 003C	4.6		Slane Michael;Heidi					*No Site Address*	Az
384	202 08 003E	2.0		Taylor Robert J Iii;Kerrie L					48803 N 7Th Ave	New River Az 85027
385	202 08 003F	3.4		Peebles Beverly J					48903 N 7Th Ave	Phoenix Az 85027
386	202 08 003G	4.7		Watson Warren W Ii;Barbara E					*No Site Address*	Az
387	202 08 003H	5.6		Wardell Fred R;Billie P					48851 N Fig Springs Rd	New River Az 85027
388	202 08 004B	10.2		Ashton June W					*No Site Address*	Az
389	202 08 004D	5.1		Peebles Beverly J					48919 N Fig Springs Rd	New River Az 85027
390	202 08 004G	2.4		Goreham Beverley A Tr					*No Site Address*	Az
391	202 08 004H	2.2		Goreham Beverley A Tr					*No Site Address*	Az
392	202 08 004J	10.3		Wahlstrom John C Tr					*No Site Address*	Az
393	202 08 004K	9.8		Hagen Peter F					*No Site Address*	Az
394	202 08 005F	5.2		Ames Paula Jannette					48614 N 3Rd St	Phoenix Az 85027
395	202 08 005J	7.9		Greve Richard M					*No Site Address*	Az
396	202 08 005K	5.4		Lasher Brian L;Sheri L					*No Site Address*	Az
397	202 08 005L	6.2		Kempinski Bernard P;Rita					107 E Mingus Rd	Phoenix Az 85027
398	202 08 005M	5.1		Rypkema Steven G;Debra S					48626 N 3Rd St	Phoenix Az 85027
399	202 08 005N	4.8		Rypkema Steven G;Debra S					*No Site Address*	Az
400	202 08 005Q	3.2		Mcclure Roy E;Marie K Tr					135 E Mingus Rd	Phoenix Az 85027
401	202 08 005R	1.7		Pyle Margaret Ann					135 E Mingus Rd	Phoenix Az 85027
402	202 08 006	39.3		Williams Edgar D Tr					*No Site Address*	Az
403	202 08 007B	10.4		Williams Edgar D Tr					*No Site Address*	Az
404	202 08 007E	5.2		Harvey Wesley R					48457 N 7Th Ave	Phoenix Az 85027
405	202 08 007F	4.9		Burnett Terry O					14848 N 33Rd Pl	Phoenix Az 85032
406	202 08 007H	5.0		Childress Ralph N					48415 N 7Th Ave	Phoenix Az 85027
407	202 08 007J	4.7		Childress Norman;Melinda E					48415 N 7Th Ave	Phoenix Az 85027
408	202 08 007K	5.0		Williams Roger A;Patricia A					48439 N 7Th Ave	Phoenix Az 85027
409	202 08 007L	2.5		Ryan Glenda					48277 N 5Th Ave	Phoenix Az 85027
410	202 08 007M	2.5		Ryan Glenda					48227 N 5Th Ave	Phoenix Az 85027
411	202 08 008B	2.0		Grant Elizabeth Sue					621 W Mingus Rd	New River Az 85027
412	202 08 008C	1.8		Cray Land Co Inc					*No Site Address*	Az
413	202 08 008C	0.2		Cray Land Co Inc					*No Site Address*	Az
414	202 08 419	5.4		Childress Ralph;Lynda					48625 N Fig Springs Rd	Phoenix Az 85027
415	202 09 004	0.8		Maricopa County					*No Site Address*	Az
416	202 09 005	0.8		Foglesong Dusty Aaron					47807 N 15Th Ave	New River Az 85027
417	202 09 006G	2.0		Grant Curtis Jay;Doris Jean					49030 N 7Th Ave	Phoenix Az 85027
418	202 09 006J	1.3		Hennessy William T;Dena C					48606 N 7Th Ave	Phoenix Az 85027
419	202 09 006K	1.0		Mccord Richard F;Jacque R					48646 N 7Th Ave	Phoenix Az 85027
420	202 09 006L	1.0		Shepston Nettie B					48818 N 7Th Ave	New River Az 85027
421	202 09 006M	3.9		Fox Kenneth Leroy;Sherry A					4113 W Fig Springs Rd	Phoenix Az 85029
422	202 09 006N	4.3		Republic;Gazette Employees Credit Unio					*No Site Address*	Az
423	202 09 007B	9.8		Gustavsen Carl;Beatrice M					*No Site Address*	Az
424	202 09 007D	8.1								

APPENDIX B, TABLE B-1
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425	202 09 007E	1.4		Scharboneau Stephen G;Robson Cheryl					48908 N 7Th Ave	New River Az 85027
426	202 09 007F	1.3		Walsh Sheila					2834 W Maryland Ave	Phoenix Az 85017
427	202 09 007G	5.2								
428	202 09 008	39.6		Williams Edgar D Tr					*No Site Address*	Az
429	202 09 009A	0.5		Hennessy William T;Dena C					*No Site Address*	Az
430	202 09 009C	4.8		Mcgee Jack W;Joyce A					48224 N 7Th Ave	New River Az 85027
431	202 09 009D	4.9		Farris Ronald C;Maudie M					48410 N 7Th Ave	Phoenix Az 85027
432	202 09 010B	3.3		Wilson Wayne R					48216 N Fig Springs Rd	New River Az 85027
433	202 09 010C	1.1		Ashton June W;Skipper D H Ashton					*No Site Address*	Az
434	202 09 010K	1.4		Dowell Michael L;Susan H					48045 N Fig Springs Rd	New River Az 85027
435	202 09 010K	0.4		Dowell Michael L;Susan H					48045 N Fig Springs Rd	New River Az 85027
436	202 09 010S	1.6		Netzley Robert H					48025 N Fig Springs Rd	Phoenix Az 85027
437	202 09 010T	2.7		Netzley Robert H					PO Box 4090	Az
438	202 09 010W	19.6		Teen Challenge Of Arizona Inc					*No Site Address*	Az
439	202 09 011D	6.9		Goetz Frederick J					*No Site Address*	Az
440	202 09 011E	3.5		Phelan Stewart L Jr;Linda L					*No Site Address*	Az
441	202 09 011F	3.1		Phelan Stewart L Jr;Linda L					*No Site Address*	Az
442	202 09 011G	3.4		Rapp Douglas E;Nancy					48209 N Fig Springs Rd	Phoenix Az 85027
443	202 09 011H	3.8		Rapp Douglas E					*No Site Address*	Az
444	202 09 013D	9.6		Arizona Board Of Regents					*No Site Address*	Az
445	202 09 013E	2.9		Stanley Harold J					819 W Wolftrap Rd	New River Az 85027
446	202 09 013F	3.3		Stanley Harold J;Linda K					*No Site Address*	Az
447	202 09 013G	0.5		Anderson Richard E;Donna L					1059 W Wolftrap Rd	Phoenix Az 85027
448	202 09 013J	5.6		Byrne Nicole W					47421 N New River Rd	Phoenix Az 85027
449	202 09 013K	3.9		Byrne Nicole W					47421 N New River Rd	New River Az 85027
450	202 09 013L	1.0		Underwood Lee C;Verbena L					*No Site Address*	Az
451	202 09 013N	1.9		Stanley Harold J;Linda K					*No Site Address*	Az
452	202 09 013P	1.9		Stanley Harold J;Linda K					47613 N 9Th Ave	Phoenix Az 85027
453	202 09 017A	5.1		Palushock Richard					48418 N Fig Springs Rd	Phoenix Az 85027
454	202 09 017B	2.3		Smith David Mitchell;Layne Alice					48420 N Fig Springs Rd	Phoenix Az 85027
455	202 09 017C	1.2		Miner Stacey L;Colleen A					48540 N Fig Springs Rd	Phoenix Az 85027
456	202 09 018D	0.6		Ross Jean L					1260 W New River Rd	Phoenix Az 85027
457	202 09 018K	1.0		Underwood Larn L;Jenny S					1232 W New River Rd	Phoenix Az 85027
458	202 09 018P	0.1		Underwood Larn L;Jenny S					1256 W New River Rd	Phoenix Az 85027
459	202 09 018P	0.7		Underwood Larn L;Jenny S					1256 W New River Rd	Phoenix Az 85027
460	202 09 018W	3.7		Single Ruth					1252 W New River Rd	Phoenix Az 85027
461	202 09 018X	0.6		Single Ruth					*No Site Address*	Az
462	202 09 018Y	1.5		Stevens Kevin W;Teresa M					1239 W New River Rd	New River Az 85027
463	202 09 019B	4.4		Lanagan Ronald James;Helen Elaine Tr					1331 W New River Rd	Phoenix Az 85027
464	202 09 019C	3.1		Young Charles A					*No Site Address*	Az
465	202 09 020A	1.8		Arizona Board Of Regents					*No Site Address*	Az
466	202 09 020E	2.3		Roberts Joseph L;Laura M					47827 N Fig Springs Rd	Phoenix Az 85027
467	202 09 020F	1.0		Ciezadlo Mark R;Valerie A					47808 N Fig Springs Rd	New River Az 85027
468	202 09 020G	2.1		Bowser Ronald A;Alpers Vicki V					47831 N 15Th Ave	Phoenix Az 85027
469	202 09 020H	1.0		Maynard Steve F;Kelly Wells					47828 N Fig Springs Rd	New River Az 85027
470	202 09 020J	0.3		Baile Dennie E;Joan M					*No Site Address*	Az
471	202 09 021A	8.2		Arizona Board Of Regents					*No Site Address*	Az
472	202 09 021B	0.9		Arizona Board Of Regents For Univ Of Az					*No Site Address*	Az
473	202 09 022C	4.6		Cicala Frank;Childress Lynda Sue					48239 N 15Th Ave	Phoenix Az 85027
474	202 09 022D	3.8		Arizona Board Of Regents					*No Site Address*	Az
475	202 09 022E	1.0		Arizona Board Of Regents					*No Site Address*	Az
476	202 09 023C	1.9		Ilicin Alexander;Shirley Jean					48403 N 15Th Ave	New River Az 85027
477	202 09 023D	0.3		Ilicin Alexander;Shirley Jean					*No Site Address*	Az

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478	202 09 024	7.5		Arizona Board Of Regents					*No Site Address*	Az
479	202 09 025	10.4		Arizona Board Of Regents					*No Site Address*	Az
480	202 09 026B	4.8		New River Bible Chapel;School					*No Site Address*	Az
481	202 09 026D	2.4		Banta Steve;Diana					1301 W New River Rd	Phoenix Az 85027
482	202 09 026F	1.3		Morris Terri Lee Stevens					47470 N 13Th Ave	New River Az 85027
483	202 09 026G	1.2		Braden Patty Jo					43608 N Black Canyon Hwy #B	Phoenix Az 85027
484	202 09 027A	0.8		Darrow Janice L;Peter					48405 N 15Th Ave	Phoenix Az 85027
485	202 09 027B	1.7		Walsh William F;Maria M					*No Site Address*	Az
486	202 09 028	1.0		Ross Jean L					1260 W New River Rd	Phoenix Az 85027
487	202 09 029C	1.0		Stanley Linda K					1301 W Roughrider Rd	New River Az 85027
488	202 09 029D	1.0		Atchley Brent W;Michelle A					48439 N 15Th Ave	New River Az 85027
489	202 09 029F	1.0		Whelpley Henry A;Anna Jolene					1408 W Roughrider Rd	Phoenix Az 85027
490	202 09 029G	1.0		Palmer Gail L;Linda C Tr					1309 W Roughrider Rd	Phoenix Az 85027
491	202 09 031A	3.5		Gagnon Trust					47608 N 9Th Ave	Phoenix Az 85027
492	202 09 031C	4.6		Ley Timothy G;Nadine					47636 N 9Th Ave	Phoenix Az 85027
493	202 09 031D	1.3		Jardine Kathleen					916 W Wolftrap Rd	New River Az 85027
494	202 09 033	1.7		Stevens Cindy R					1121 W Wolftrap Rd	New River Az 85027
495	202 09 N/A	0.3								
496	202 09 N/A	0.7								
497	202 09 N/A	0.3								
498	202 15 001	639.3		State of Arizona					*No Site Address*	
499	202 16 001A	4.1		Smith Vincent O;Patty A					47027 N New River Rd	New River Az 85027
500	202 16 002	5.1		Smith Vincent O;Patty A					47007 N New River Rd	Phoenix Az 85027
501	202 16 003D	9.9		Eastin Ronald C;Ann E Tr					*No Site Address*	Az
502	202 16 003E	4.8		Bees Linda K					47201 N New River Rd	Phoenix Az 85027
503	202 16 003K	2.6		Eastman Donald D Jr;Deborah K					19419 N 8Th Pl	Phoenix Az 85024
504	202 16 003L	1.5		Mathews Sandra					47207 N New River Rd	Phoenix Az 85027
505	202 16 003M	1.3		Karns Victor N;Andrea F					47205 N New River Rd	Phoenix Az 85027
506	202 16 004D	2.1	Mary Beth	Reed					*No Site Address*	Az
507	202 16 004E	1.6	Eddie H	Shelton					*No Site Address*	Az
508	202 16 004F	1.3	Eddie H	Shelton					47222 N 7Th Ave	New River Az 85027
509	202 16 004G	3.6	Mary Beth	Reed					47222 N 7Th Ave	Phoenix Az 85027
510	202 16 004H	1.5	James M;Linda	Sellett					46827 N 6Th Ave	Phoenix Az 85027
511	202 16 005E	5.4		Brakefield Benjamin Wade;Jacqueline F					47002 N New River Rd	Phoenix Az 85027
512	202 16 005F	5.3		Fitts John W;Cora R Burgess					*No Site Address*	Az
513	202 16 005G	5.9		Sasfai John W;Dale E					46855 N New River Rd	Phoenix Az 85027
514	202 16 006B	5.1		Mccormick Leon Joe;Betty Sue;Dave					3525 W Photo View Rd	Az
515	202 16 006D	2.2		Moody Clarence D Jr;Christine A					46812 N 13Th Ave #Phoeni	Phoenix Az 85027
516	202 16 006E	2.4		Corrick Marvin;Andrea					*No Site Address*	Az
517	202 16 006G	2.6		Sisson Errol R;Martha R					46831 N 13Th Ave	Phoenix Az 85027
518	202 16 006H	2.3		Hammond Joel Wayne					*No Site Address*	Az
519	202 16 006J	2.1		Lopez Manuel R;Mary J					46809 N 13Th Ave	Phoenix Az 85027
520	202 16 006K	2.4		Russell William C;Tamaria L					46812 N 11Th Ave	Phoenix Az 85027
521	202 16 007A	2.2		Valenzuela Manuel R;Gracie					*No Site Address*	Az
522	202 16 007B	2.1		Richardson Gordon Dale;Patsy Kay					*No Site Address*	Az
523	202 16 007C	2.2		Crawford James M;Rosemary E					47030 N 14Th Ave	Phoenix Az 85027
524	202 16 007E	1.9		Bradner Stephen Martin;Melissa Kay					47012 N New River Rd	New River Az 85027
525	202 16 008A	2.5		Richardson Gordon D;Patsy K					*No Site Address*	Az
526	202 16 008C	2.2		Richardson Gordon Dale;Patsy Kay					*No Site Address*	Az
527	202 16 008F	2.6								
528	202 16 008G	2.6		Sokol Patricia A					47013 N 13Th Ave	Phoenix Az 85027
529	202 16 009	3.2		Deleano Tony;Antoinette B					*No Site Address*	Az
530	202 16 010N	2.2		Werner George Paul;Joyce Ann					*No Site Address*	Az

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531	202 16 010P	2.0		Sweeney Robert J;Mary J					*No Site Address*	Az
532	202 16 010Q	0.5		Hammond Thelma L					*No Site Address*	Az
533	202 16 010R	0.1		Deleano Tony;Antoinette B					*No Site Address*	Az
534	202 16 010S	0.1		Deleano Tony;Antoinette B					*No Site Address*	Az
535	202 16 010W	0.0		Wikarski Lawrencel;Sinohui Andrea A					*No Site Address*	Az
536	202 16 010X	1.3		Hayward Margaret Ann					47240 N 13Th Ave	Az
537	202 16 010Y	1.1		Nelsen Thomas R					4040 W Peoria Ave #2080	Phoenix Az 85029
538	202 16 010Z	1.4		Wikarski Lawrence L;Andrea Sinohui					47300 N New River Rd	Phoenix Az 85027
539	202 16 012K	1.3		Nickerson Dorothy					46609 N New River Rd	Phoenix Az 85027
540	202 16 012L	2.5		Pirri Anthony J;Margaret L	(623) 465-7840				46636 N New River Rd	New River Az 85087
541	202 16 012L	0.2		Pirri Anthony J;Margaret L	(623) 465-7840				46636 N New River Rd	New River Az 85087
542	202 16 012M	2.0		Sherick William Robert Jr					46625 N New River Rd	Phoenix Az 85027
543	202 16 012P	1.5		Currey Albert Ben;Angela Denise					46631 N 11Th Ave	Phoenix Az 85027
544	202 16 012R	1.6		Laorr Anan K;Eileen					*No Site Address*	Az
545	202 16 012S	1.4		Currey Albert Ben;Angela Denise					46631 N 11Th Ave	Phoenix Az 85027
546	202 16 012T	1.4		Sutton Sandra L;Davidson Susan J					46611 N 11Th Ave	Phoenix Az 85027
547	202 16 012U	0.3		Sutton Sandra L;Davidson Susan J					*No Site Address*	Az
548	202 16 012V	3.5		Davidson Marion J;Susan J					*No Site Address*	Az
549	202 16 012V	1.6		Davidson Marion J;Susan J					*No Site Address*	Az
550	202 16 012V	0.0		Davidson Marion J;Susan J					*No Site Address*	Az
551	202 16 013B	10.1		Groves Carl E					46641 N 13Th Ave	Phoenix Az 85027
552	202 16 013E	2.6		Mckinley Donald W;Dorothy J					46635 N 15Th Ave	Phoenix Az 85027
553	202 16 013F	2.6		Gunnison Robert H;Vonie J					46630 N 13Th Ave	Phoenix Az 85027
554	202 16 013G	2.2		Farley E Merrill;Farley Sara Allyne Tr					46640 N 13Th Ave	New River Az 85027
555	202 16 013H	2.4		Ploense Marvin R;Robin E;Bart D;Tracy L					*No Site Address*	Az
556	202 16 014	1.0		Wikarski Lawrencel;Sinohui Andrea A					*No Site Address*	Az
557	202 16 015C	1.0		Potter Mikal W;Janet L					47215 N New River Rd	Phoenix Az 85027
558	202 16 015E	1.9		Henslee Lawrence V					47206 N New River Rd	New River Az 85027
559	202 16 016B	2.5		Mitcham Tom E;Sarah J					47000 N New River Rd	Phoenix Az 85027
560	202 16 016C	3.9								
561	202 16 N/A	1.7								
562	202 16 N/A	0.2								
563	202 16 N/A	0.7								
564	202 16 N/A	0.3								
565	202 16 N/A	0.2								
566	202 21 005L	1.0		Harford Kathleen					45045 N 6Th St	Phoenix Az 85027
567	202 21 005M	0.9		Olszewski Mark					*No Site Address*	Az
568	202 21 006K	1.9		Pugh William;Thelma					44426 N 7Th St	New River Az 85027
569	202 21 006L	2.9		Terry Fred Wayne;Diana L					44424 N 7Th St	Phoenix Az 85027
570	202 21 006M	5.1		Jordan David K					604 W Circle Mountain Rd #A	Phoenix Az 85027
571	202 21 006N	10.1		Hess Joseph A;Sondra J Tr					530 E Circle Mountain Rd	Phoenix Az 85027
572	202 21 006Q	9.6		Maricopa County State Of Arizona					*No Site Address*	Az
573	202 21 006R	1.0		Curmatureanu Ion;Cornelia					*No Site Address*	Az
574	202 21 006R	8.1		Curmatureanu Ion;Cornelia					*No Site Address*	Az
575	202 21 007A	20.5		Hare Investments Ltd Prtnrsp					*No Site Address*	Az
576	202 21 007B	19.0		Maricopa County					26 W Circle Mountain Rd	Phoenix Az 85027
577	202 21 008B	2.0		Coombs Joseph H;Rose E Tr					7350 E Stetson Dr #105	Scottsdale Az 85251
578	202 21 008S	1.3		Kraus Investments L C					46834 N Shangri La Ln	New River Az 85027
579	202 21 008T	36.4		Kraus Investments L C					46834 N Shangri La Ln	New River Az 85027
580	202 21 011B	9.6		Robertson Sloan L					*No Site Address*	Az
581	202 21 013D	8.9		Stein G S;A F;Reich S;Pelman Ltd Partner					*No Site Address*	Az
582	202 21 013F	9.6		Bruder William P;Joellen					44020 N Circle Mt Road New Riv	Az
583	202 21 013L	9.0		Stein G S;A F;Reich S;Pelman Ltd Partner					*No Site Address*	Az

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584	202 21 013M	9.4		Funk Donna M;Proulx Bradley E			43426 N 7Th Ave	New River Az 85087	43426 N 7Th Ave	New River Az 85087
585	202 21 013R	9.2	Jeanie	Eller	(623) 465-0195	(623) 465-0274 fax	PO Box 4944	Cave Creek AZ 85327	42828 N 7Th Ave	New River AZ 85087
586	202 21 013T	2.3		Fisher James Michael					*No Site Address*	Az
587	202 21 013U	2.4		Thompson John R;Evelyn H					*No Site Address*	Az
588	202 21 013V	4.8		George Laurel L					43442 N 13Th Ave	Phoenix Az 85027
589	202 21 013W	4.9		Rummel Charles O Jr					*No Site Address*	Az
590	202 21 013X	4.6		Bowers Arden L;Alice C					*No Site Address*	Az
591	202 21 013Z	5.0		La Moure Steve Michael;Joan E					1114 W Circle Mountain Rd	New River Az 85027
592	202 21 014A	4.3		Burch Rita					*No Site Address*	Az
593	202 21 014B	4.4		Ilijasic Gino;Bruna					*No Site Address*	Az
594	202 21 015	9.9		Brown J Hoyt;Patricia V					*No Site Address*	Az
595	202 21 016D	2.4		Funk Donna M					43426 N 7Th Ave	Phoenix Az 85027
596	202 21 016G	1.7		Funk Donna M					43415 N 13Th Ave #New	Phoenix Az 85027
597	202 21 016H	1.7								
598	202 21 016J	1.9		Inukai George;Kerry					43419 N 11Th Ave	Phoenix Az 85027
599	202 21 016K	1.3		Nabors Ken J;Shirley G					43426 N 7Th Ave	Phoenix Az 85027
600	202 21 016L	1.3		Tarver William D;Tracy L					43426 N 7Th Ave	Phoenix Az 85027
601	202 21 017B	3.8		Rezek Dennis D					*No Site Address*	Az
602	202 21 017D	1.7		Erb Robert;Audrey					43828 N 13Th Ave	Phoenix Az 85027
603	202 21 018D	4.7		Schartz Chales A					*No Site Address*	Az
604	202 21 018E	4.6		Swartz Charles A					*No Site Address*	Az
605	202 21 019A	4.8		Weiss Donald G;Sue L					43807 N 11Th Ave	Phoenix Az 85027
606	202 21 019B	5.1		Weiss Donald G;Sue L					43950 N 11Th Ave	Phoenix Az 85027
607	202 21 020A	4.8		Hirt David J					43818 N 11Th Ave	Phoenix Az 85027
608	202 21 020C	2.2		Scharer Stuart;Jane					1100 W Circle Mountain Rd	Phoenix Az 85027
609	202 21 020D	1.0		Laird David Allen;Janet					*No Site Address*	Az
610	202 21 020E	1.0		Darby Trust					8650 E Montebello Ave	Scottsdale Az 85250
611	202 21 021	9.5		Strebler James R;Brenda J					*No Site Address*	Az
612	202 21 022A	4.2		Walker Berten F;Barbara E					42645 N 11Th Ave	Phoenix Az 85027
613	202 21 022B	4.1		Z-Snap Inc					42614 N 11Th Ave	Phoenix Az 85027
614	202 21 023	8.8		Miller Jean A					*No Site Address*	Az
615	202 21 024A	4.2		Lund Wayne E			PO Box 613	Carlin Nv 89822	*No Site Address*	Az
616	202 21 024B	4.5	Daniel R. & Kathleen	Albert	(623) 465-5971				42745 N 7Th Ave	Phoenix Az 85027
617	202 21 025B	4.8		Culp Oscar A;Peggy J					*No Site Address*	Az
618	202 21 025D	1.2		Wolfe John H;Leslie L					42811 N 11Th Ave	Phoenix Az 85027
619	202 21 025E	1.1		Manley Carl L;Nancy L					42889 N 11Th Ave	Phoenix Az 85027
620	202 21 025F	1.2		Grace Marion C					42815 N 11Th Ave	New River Az 85027
621	202 21 025G	1.3		Grace William Cecil Ii					*No Site Address*	3 Az
622	202 21 026	9.5		Caldis Niki					*No Site Address*	Az
623	202 21 027A	4.6		Haynes Lewis L Iii;Margaret A					*No Site Address*	Az
624	202 21 027B	4.9		Strebler James R;Brenda J					*No Site Address*	Az
625	202 21 028A	4.7		Watkins L Allyn Tr					42635 N 11Th Ave	Phoenix Az 85027
626	202 21 028B	2.2		Schwarze Robert C;Tracey O					*No Site Address*	Az
627	202 21 028C	2.3		Schwarze Robert C;Tracey O					*No Site Address*	Az
628	202 21 029A	4.8		Gieselman Janet;Kinney Susan					*No Site Address*	Az
629	202 21 029B	5.0		Chevallier Jean-Yves P;Marie R					43000 N 11Th Ave	New River Az 85027
630	202 21 030A	4.9		Klug Sande					43041 N 11Th Ave	Phoenix Az 85027
631	202 21 030D	2.4		Andersen Sidney W;Lisa M					43015 N 11Th Ave	Phoenix Az 85027
632	202 21 030E	0.9		Kovach Craig L					*No Site Address*	Az
633	202 21 030F	1.3		Romega Thompson Vasile;Annie					*No Site Address*	Az
634	202 21 031C	8.7		Selleys Charles T Tr					43826 N 3Rd Ave	Phoenix Az 85027
635	202 21 031E	9.0		Kraus Investments Lc					*No Site Address*	Az
636	202 21 031J	4.6		Sartain James P;Wanda A					*No Site Address*	Az

APPENDIX B, TABLE B-1
SKUNK CREEK WATERCOURSE MASTER PLAN, PHASES 1 and 2
List of Property Ownership Information Sorted by TAG Number

TAG No. (1)	Assessors's Parcel Number (2)	Parcel Area (3)	Name of Owner First (4)	Name of Owner Last (5)	Phone Number (6)	e-mail Address	Mailing Address 1 (7)	Mailing Address 2 (8)	Site Address 1 (9)	Site Adress 2 (10)
637	202 21 031L	0.8		Smith Cheryl Leah Smith;Sartain Wanda					407 W Circle Mountain Rd	New River Az 85027
638	202 21 031M	3.3		Porrazzo Salvatore J;Margaret E					116 W Circle Mountain Rd	Phoenix Az 85027
639	202 21 031Q	2.7		Sartain James P;Wanda A	(623) 465-7749		43020 N 3Rd Ave	New River Az 85087	43020 N 3Rd Ave	New River Az 85087
640	202 21 031R	0.7		Davis Wm G;Rose Mary					*No Site Address*	Az
641	202 21 031S	2.3		Henscheid Lawrence Steve					*No Site Address*	Az
642	202 21 031T	2.6		Henscheid Lawrence Steve					43605 N 7Th Ave	Phoenix Az 85027
643	202 21 031U	4.6		Hearne Charles P;L S Henscheid					*No Site Address*	Az
644	202 21 031W	4.5		Bushong Linda A					43434 N 7Th Ave	Phoenix Az 85027
645	202 21 031Y	2.3		Conley Joe Reese;Dorothy Louise					*No Site Address*	Az
646	202 21 031Z	4.1		Trombi Robert P;Joette C					47 W Circle Mountain Rd	Phoenix Az 85027
647	202 21 032A	4.7		Caldwell David L;Carol A	(623) 465-7670				43750 N 3Rd Ave	New River Az 85087
648	202 21 032D	3.0		Norris Dean U;Juanita					43610 N 3Rd Ave	Phoenix Az 85027
649	202 21 032E	0.3		Vaughan Hazel A;Matthew P;Elizabeth B					*No Site Address*	Az
650	202 21 032F	1.6		Vaughan Hazel A;Matthew P;Elizabeth B					43612 N 3Rd Ave	New River Az 85027
651	202 21 033A	4.8		Groves Carl E					44625 N 14Th St	Phoenix Az 85027
652	202 21 033B	4.9		Jutson Reece A;Wilda Larose Tr					43909 N Central Ave	Phoenix Az 85027
653	202 21 034A	4.5		Plenty Ruth A					43436 N 3Rd Ave	Phoenix Az 85027
654	202 21 034B	4.1		Schmitt Marguerite A					43416 N 3Rd Ave	New River Az 85027
655	202 21 035A	1.6		Jenkins Robert L;Virginia A					44126 N 3Rd Ave	New River Az 85027
656	202 21 035B	7.5		Jenkins Robert L;Virginia A					*No Site Address*	Az
657	202 21 036D	1.7		Goveia Richard A;Roberta Lynn					43819 N 3Rd Ave	New River Az 85027
658	202 21 036F	1.5		Pino Victor;Josephine Ann					43817 N 3Rd Ave	Phoenix Az 85027
659	202 21 036G	3.2		Andree Wallace D Jr;Vicki L					43825 N 3Rd Ave	Phoenix Az 85027
660	202 21 036H	0.0		Andree Wallace D Jr;Vicki L;Etal					43825 N 3Rd Ave	Phoenix Az 85027
661	202 21 036L	1.6		Miller Jeffrey B;Maureen M					43829 N 3Rd Ave	Phoenix Az 85027
662	202 21 036M	1.4		Thompson Gale P					43841 N 3Rd Ave	Phoenix Az 85027
663	202 21 037A	6.7		Eardley Edward John;Jo Anne A					211 W Leann Ln	New River Az 85027
664	202 21 037C	1.1		Hall Robert A;Sandra L					43411 N 3Rd Ave	Phoenix Az 85027
665	202 21 037D	1.1		Pendergrass James Allen					43417 N 3Rd Ave	New River Az 85027
667	202 21 038A	4.8		Harkins Dennis R;Sierra Sue					115 W Leann Ln	Phoenix Az 85027
668	202 21 038B	4.7		Tallman Frank S;Bonnie J					*No Site Address*	Az
669	202 21 039A	4.5		Cuthbertson Dennis E;Kathryn R					19234 N 5Th Pl	Phoenix Az 85024
670	202 21 039C	2.3		Cuthbertson Dennis;Kathryn					*No Site Address*	Az
671	202 21 039D	1.1		Russell Wade William					*No Site Address*	Az
672	202 21 039E	1.3		Pinckard Sam Lowell					235 W Southern Ave #169	Mesa Az 85210
673	202 21 040A	4.5		Crandell Raymond;Connie					211 W Circle Mountain Rd	Phoenix Az 85027
674	202 21 040B	4.9		Mcallister Paul H;Ann					201 W Circle Mountain Rd	New River Az 85027
675	202 21 041B	4.7		Conway Deborah					22233 N 23Rd Ave	Phoenix Az 85027
676	202 21 041C	2.4		Caylor James B;Ann L					43701 N 1St Dr	New River Az 85027
677	202 21 041D	2.6		Head Francis O;Frances V					43702 N Central Ave	Phoenix Az 85027
678	202 21 042D	4.6		Gregg George R Iii;Julie					42805 N 7Th Ave	Phoenix Az 85027
679	202 21 042G	2.2		Wolcott Stephen P;Tammie;Vv					43046 N 3Rd Ave	New River Az 85027
680	202 21 042J	2.3		Sartain J Perry Jr;Wanda A					*No Site Address*	Az
681	202 21 042K	2.4		Mcneela James Stephen Tr					*No Site Address*	Az
682	202 21 042M	3.0		Holliday Glen L					PO Box 659 Black Cyn S	Az
683	202 21 042N	1.3		Emerson Dale					*No Site Address*	Az
684	202 21 042P	4.6		Caperton Robert W;Marsha J					43226 N 3Rd Ave	Phoenix Az 85027
685	202 21 042Q	2.2		Jensen Jason R					42939 N 7Th Ave	Phoenix Az 85027
686	202 21 042R	2.4		Baker James C;Janet E					42845 N 7Th Ave	Phoenix Az 85027
687	202 21 042S	1.0		Martin Margaret L					43006 N 3Rd Ave	New River Az 85027
688	202 21 042T	1.3		Jospeh Susan					*No Site Address*	Az
689	202 21 043	9.0		Bauer Richard A					43207 N 7Th Ave	Phoenix Az 85027
690	202 21 044	9.4		Robertson Sloan L					43221 N 3Rd Ave	Phoenix Az 85027

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691	202 21 045	9.8		Robertson Sloan L					*No Site Address*	Az
692	202 21 046C	1.1		Price Earl R Tr					43037 N 7Th Ave	Phoenix Az 85027
693	202 21 046D	1.1		Terry Cynthia A					43027 N 7Th Ave	Phoenix Az 85027
694	202 21 046J	1.0		Albert Daniel R;Kathleen A					43011 N 7Th Ave	Phoenix Az 85027
695	202 21 046K	1.2		Koskovich Michael A;Tawnya D					43001 N 7Th Ave	New River Az 85027
696	202 21 046L	1.1		Koestel Lea S;Gwen					43009 N 7Th Ave	Phoenix Az 85027
697	202 21 046M	1.3		Nies Samuel					43009 N 7Th Ave	Phoenix Az 85027
698	202 21 046P	1.0		Atkinson Bertha Evelyn					43017 N 7Th Ave	Phoenix Az 85027
699	202 21 046Q	0.0		Atkinson Bertha E					*No Site Address*	Az
700	202 21 046R	1.0		Oconnor Robert H					*No Site Address*	Az
701	202 21 047	9.2		Bassett David J;Joella A Tr					*No Site Address*	Az
702	202 21 048A	4.6		Kwiatkowski Craig;Cheryl					42838 N 3Rd Ave	Phoenix Az 85027
703	202 21 048C	2.1		Ashley Hobert J Jr;Flora E					42806 N 3Rd Ave	Phoenix Az 85027
704	202 21 048D	2.6		Ashley Hobert John Jr;Flora E					*No Site Address*	Az
705	202 21 049	8.7		Anderson Gladys F Tr					*No Site Address*	Az
706	202 21 050A	4.7		Newby Keith Walter;Law-Newby Donna					520 W Honda Bow Rd	Phoenix Az 85027
707	202 21 050B	4.2		Law Bruce T;Ruth C					*No Site Address*	Az
708	202 21 051	4.8		Lamoure Steven M;Joan E					*No Site Address*	Az
709	202 21 052	5.1		Coplen Jeanne Elise					822 E Virginia Ave	Phoenix Az 85006
710	202 21 053	2.6		Zurcher Robert S					*No Site Address*	Az
711	202 21 053	1.5		Zurcher Robert S					*No Site Address*	Az
712	202 21 054	4.5		Barnes Larry L;Kathryn J					*No Site Address*	Az
713	202 21 055	1.4		Williams Jody Ann					602 W Circle Mountain Rd	Phoenix Az 85027
714	202 21 056	2.3		Gary G Dabney Trust					44020 N 7Th Ave	Phoenix Az 85027
715	202 21 057	5.1		Bowers Arden L;Alice C					*No Site Address*	Az
716	202 21 058	4.9		Donaghy Samuel E					43633 N 13Th Ave	New River Az 85027
717	202 21 060	4.6		Grabach George J;Ruth J					224 E Sabrosa Dr	New River Az 85027
718	202 21 061B	1.0		Smith Albert;Mary L					45025 N 6Th St	Phoenix Az 85027
719	202 21 061C	0.6		Sack William E;Stephanie L					45023 N 7Th St	Phoenix Az 85027
720	202 21 061E	0.9		Crane Myron E;Betty A					11222 N 84Th St	Scottsdale Az 85260
721	202 21 061F	1.0		Vega Anthony R Jr;Suzette R					*No Site Address*	Az
722	202 21 061H	1.0		Calica Melissa A					45007 N 6Th St	Phoenix Az 85027
723	202 21 061J	1.3		Lama Carol A					45005 N 6Th St	New River Az 85027
724	202 21 062	4.4		Murphy Terence T;Marchand Lucille I					45203 N 6Th St	Phoenix Az 85027
725	202 21 063	4.7		Greve Robert E;Frances M					102 E Sabrosa Dr #Phx	Phoenix Az 85027
726	202 21 064	4.5		Guenther Jacob;Justina					*No Site Address*	Az
727	202 21 065	4.8		Hineman Timothy Earl;Bateman Toni S					230 E Sabrosa Dr	Phoenix Az 85027
728	202 21 066	5.2		Olmsted Ransford K;Sharon A					314 E Sabrosa Dr	Phoenix Az 85027
729	202 21 067	4.6		Blair Gary W;Linda J					412 E Sabrosa Dr	Phoenix Az 85027
730	202 21 068	4.9		Schmueckle Siegreied;Sturm Jennifer L					45237 N 6Th St	Phoenix Az 85027
731	202 21 069	4.4		Balsiger Herman L;Phyllis J					45024 N 6Th St	Phoenix Az 85027
732	202 21 070	5.0		Lamoure Roger D;Joanne K Tr					*No Site Address*	Az
733	202 21 071	4.8		Nagel Donna L					229 E Sabrosa Dr	Phoenix Az 85027
734	202 21 072C	4.6		Lund Anthony;Cheryl L					201 E Sabrosa Dr	Phoenix Az 85027
735	202 21 073	4.6		Levin Bradley R					105 E Sabrosa Dr	Phoenix Az 85027
736	202 21 074	4.7		Decker Joseph Murray;Alberta Cross Tr					Unknown	Az
737	202 21 075	4.9		Smith Stephen W;Robbie A					45637 N New River Rd	Phoenix Az 85027
738	202 21 076	5.5		Robbeloth Michael;Margaret J Tr					8 E Venado Dr	Phoenix Az 85027
739	202 21 077	5.1		Kerr Jack Edward;Betty Jo					12 E Venado Dr	Phoenix Az 85027
740	202 21 078	3.9		Grabosky William;Grace					14 E Venado Dr	Phoenix Az 85027
741	202 21 079	3.9		Mcculley Johnny Dee					106 E Venado Dr	Phoenix Az 85027
742	202 21 080	4.2		Defreyn Yves J;Helene					204 E Venado Dr	Phoenix Az 85027
743	202 21 081C	4.6		Horton Lloyd A;Mary A					228 E Venado Dr	Phoenix Az 85027

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744	202 21 082	4.6		Grenier Lucien G;Audrey C					314 E Venado Dr	Phoenix Az 85027
745	202 21 083	4.4		Strippelman John C;Sharon L					416 E Venado Dr	New River Az 85027
746	202 21 084	4.3		Cook Valerie J					45629 N 6Th St	Phoenix Az 85027
747	202 21 085	4.7		Lachance Gregory;Cheryl					45615 N 7Th St	Phoenix Az 85027
748	202 21 086	4.8		Cottam Loraine J;Christine					45431 N 6Th St #New	Phoenix Az 85027
749	202 21 087C	3.3		Pugh Billie Jean					45404 N 6Th St	New River Az 85027
750	202 21 087D	0.5		Mano Inc					*No Site Address*	Az
751	202 21 088	4.5		Cossey Michael C;Susan G					*No Site Address*	Az
752	202 21 089	5.0		Fallenveck Eberhardt G;Nancy B					313 E Venado Dr	Phoenix Az 85027
753	202 21 090C	4.9		Fetters Stephen D;Nancy A					227 E Venado Dr	Phoenix Az 85027
754	202 21 091	4.5		Young Bonnie A					203 E Venado Dr	Phoenix Az 85027
755	202 21 092	4.6		Clark Gustav H;Karla R					108 E Venado Dr	Phoenix Az 85027
756	202 21 093	4.5		Perchal Alene A					13 E Venado Dr	Phoenix Az 85027
757	202 21 094	4.6		Bubar David A;Veronica L					11 E Venado Dr	New River Az 85027
758	202 21 095	4.4		Cain Doran;Kathleen R					45439 N New River Rd	Phoenix Az 85027
759	202 21 096	5.2		Farley Mary F;Maciver Duncan I					45417 N New River Rd	New River Az 85027
760	202 21 097	4.7		Dominic Donald S;Jeanette L					124 E Sabrosa Dr	Phoenix Az 85027
761	202 21 098	4.3		Brasmer Scott J					104 W Sabrosa Dr	Phoenix Az 85027
762	202 21 099	4.4		Whitacre Leighanne M					102 W Sabrosa Dr	Phoenix Az 85027
763	202 21 100	4.4		Corbett Chris					13 W Sabrosa Dr	Phoenix Az 85027
764	202 21 101	4.3		Mayer Robert Allen;Diana					103 W Sabrosa Dr	Phoenix Az 85027
765	202 21 102	3.9		Schumacher Dennis L;Hannah E					123 W Sabrosa Dr	Phoenix Az 85027
766	202 21 103	5.4		Gavin Robert Edward Sr					44827 N New River Rd	Phoenix Az 85027
767	202 21 104	5.6		Hanson Linda Sue;Alan D Pribble					44805 N New River Rd #New	Phoenix Az 85027
768	202 21 105A	3.8		Peters William M;Rosaline L					102 E Mano Dr	Phoenix Az 85027
769	202 21 105B	0.1		Dosselman Barbara					102 E Mano Dr	Phoenix Az 85027
770	202 21 106A	2.5		Relation Donald D;Sharon L					*No Site Address*	Az
771	202 21 106C	1.3		Relation Donald D;Sharon L					*No Site Address*	Az
772	202 21 106D	1.0		Relation Donald D;Sharon L					204 E Mano Dr	Phoenix Az 85027
773	202 21 107	4.9		Mutschler Marcia Sue					520 E Mano Dr	Phoenix Az 85027
774	202 21 107C	3.7								
775	202 21 108	5.2		Byerly David J;Patricia Ann					312 E Mano Dr	Phoenix Az 85027
776	202 21 109	4.6		Bishop Gary W;Pamela E					416 E Mano Dr	Phoenix Az 85027
777	202 21 110	4.6		Thompson Timothy N;Barbara L					44833 N 6Th St	Phoenix Az 85027
778	202 21 111	5.1		Layton Frances K					4770 New Riv	Az
779	202 21 112	4.8		Miller Floyd H;Diana L					44635 N 6Th St	Phoenix Az 85027
780	202 21 113	4.8		Knight Ernest L;Marita R					44603 N 6Th St	Phoenix Az 85027
781	202 21 114	4.7		Simpson Alfred F;Dorothy I					415 E Mano Dr	Phoenix Az 85027
782	202 21 115	5.2		Curtis David W;Vicki S					511 E Mano Dr	New River Az 85027
783	202 21 116	4.9		Schillinger Development Inc					227 E Mano Dr	Phoenix Az 85027
784	202 21 117	4.8		Mc Call Pamela A;David L					203 E Mano Dr	Phoenix Az 85027
785	202 21 118	4.9		Lds Church Of Jesus Christ					*No Site Address*	Az
786	202 21 119B	0.9		Rezek Dennis D					44433 N New River Rd	Phoenix Az 85027
787	202 21 119C	0.6		Singer Tina					44433 N New River Rd	Phoenix Az 85027
788	202 21 119D	4.5		Singer Tina					44433 N New River Rd	Phoenix Az 85027
789	202 21 120A	0.7		Rezek Dennis D					44433 N New River Rd	Phoenix Az 85027
790	202 21 120B	5.1		Bates Clayton Reuel					44405 N New River Rd	Phoenix Az 85027
791	202 21 121A	4.3		Bittick Robert J;Joy Marie					*No Site Address*	Az
792	202 21 121B	0.4		Rezek Dennis D					44405 N New River Rd	Phoenix Az 85027
793	202 21 122	4.7		Maricopa County State Of Arizona					*No Site Address*	Az
794	202 21 123	5.6		Maricopa County					*No Site Address*	Az
795	202 21 124	5.5		Maricopa County					44202 N New River Rd	Phoenix Az 85027
796	202 21 125	6.5		Calhoun Mark A Sr;Betty A					44612 N New River Rd	Phoenix Az 85027

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797	202 21 126	5.9		Kafka Stephen P;Pamela					44648 N New River Rd	Phoenix Az 85027
798	202 21 127	5.0		Reidl Raymond L;Joyce L					44635 N Perdiz Dr	Phoenix Az 85027
799	202 21 128	6.7		Babcock Richard N					44640 N Perdiz Dr	Phoenix Az 85027
800	202 21 129	4.8		Philip Heather Lea					44824 N New River Rd	Phoenix Az 85027
802	202 21 130	3.9		Svoboda Frank;Dorothy N Tr					44844 N Shangri La Ln	Phoenix Az 85027
803	202 21 131	5.3		Glass Timothy A;Judy R					*No Site Address*	Az
804	202 21 132A	2.5		Dagburg L L C					*No Site Address*	Az
805	202 21 132B	2.8		Dagburg L L C					44620 N Shangri La Ln	New River Az 85027
806	202 21 133	4.6		Coombs Joseph H;Rose E Tr					*No Site Address*	Az
807	202 21 134	5.3		Simpson Roger Thomas;Donnia					44806 N Zorrillo Dr	Phoenix Az 85027
808	202 21 135	4.8		Lang Marjorie E					44830 N Zorrillo Dr	New River Az 85027
809	202 21 136	4.7		Hudson Harvey C;Christine M					45006 N Zorrillo Dr	Phoenix Az 85027
810	202 21 137	4.8		Eischens Jeanie A					45034 N Zorrillo Dr	Phoenix Az 85027
811	202 21 138	3.7		Drevs Richard Jr;Margaret S Tr					37035 N 17Th Ave	Phoenix Az 85027
812	202 21 139	4.6		Harton David B;Barbara E O					*No Site Address*	Az
813	202 21 140	4.0		Garcia Ernest G;Kulina Paula M					*No Site Address*	Az
814	202 21 141	4.7		Hilburn Joan L;Dean R					*No Site Address*	Az
815	202 21 142	5.3		Hilburn Joan L;Dean R					427 W Pontiac Dr #2	Phoenix Az 85027
816	202 21 143A	3.6		Hilburn Joan L;Dean R					*No Site Address*	Az
817	202 21 143B	0.8		Hafler Evelyn M;Lehman Sandra J					4444 N 32Nd St	Phoenix Az 85018
818	202 21 144	3.8		George T;Kris E Pingitore Trust					33840 N Cave Creek Rd	Cave Creek Az 85331
819	202 21 145	5.0		Barnes J R;Carol J					*No Site Address*	Az
820	202 21 146A	1.6		Matta Stacey M					*No Site Address*	Az
821	202 21 146B	2.8		Mata Stacey M					45418 N New River Rd	New River Az 85027
822	202 21 147A	2.7		Wright Michael					45248 N New River Rd	Phoenix Az 85027
823	202 21 147B	2.4		Hafler Evelyn M;Lehman Sandra J					*No Site Address*	Az
824	202 21 148	4.8		Lambeth Harold R;Marilyn L					45048 N New River Rd	Phoenix Az 85027
825	202 21 149	4.6		Robinson Dennis J;Karen J					45016 N New River Rd	Phoenix Az 85027
826	202 21 150	3.9		Parry Michael K;Debra T					44833 N Shangri La Ln	Phoenix Az 85027
827	202 21 151	5.4		Griswold Kirk Jay					44805 N Zorrillo Dr	Phoenix Az 85027
828	202 21 152	5.1		Crawford John Paul;Ellen Marie					44837 N Zorrillo Dr	Phoenix Az 85027
829	202 21 153	5.0		Moore Michael D;Darcy L					45025 N Zorrillo Dr	Phoenix Az 85027
830	202 21 154	4.9		Albillar Robert J;Lisa A					4319 W Zorillo	Az
831	202 21 155	4.9		Donaldson David;Mary Lou					4419 S Elm St	Tempe Az 85282
832	202 21 156	5.2		Carson Billy J;Debra Ann					45419 N Zorrillo Dr	Phoenix Az 85027
833	202 21 157	5.5		Sullivan John J;Miava					45603 N Zorrillo Dr	Phoenix Az 85027
834	202 21 159	1.0		Sabrosa Water Co					*No Site Address*	Az
835	202 21 160	0.9		Sabrosa Water Co					*No Site Address*	Az
836	202 21 161	0.5		Drevs Richard Jr;Margaret S Tr					*No Site Address*	Az
837	202 21 162	1.0		Conder Margaret L Tr					*No Site Address*	Az
838	202 21 163	4.8		Strouse Grace M					43205 N 13Th Ave	Phoenix Az 85027
839	202 21 164A	2.4		Desio Richard J;Phyllis					*No Site Address*	Az
840	202 21 164B	1.0		Fields Larry;Rose					*No Site Address*	Az
841	202 21 164C	1.2		Cunningham Victor Leslie					43202 N 11Th Ave	Phoenix Az 85027
842	202 21 165	2.2		Law Michael L;Valys U					*No Site Address*	Az
843	202 21 166	2.6		Law Michael L;Valys U					*No Site Address*	Az
844	202 21 167A	2.6		Law Michael L;Valys U					43203 N 11Th Ave	Phoenix Az 85027
845	202 21 167B	2.3		Klusek Andrew P					43203 N 11Th Ave	Phoenix Az 85027
846	202 21 168	4.7	Clayton W & Claudia S	Roler	(623) 465-0505		43024 N 7th Ave	New River AZ 85087	43024 N 7Th Ave	New River Az 85087
847	202 21 169	4.5	Joe E & Claudia M	Hines	(623) 465-7200		43012 N 7th Ave	New River AZ 85087	43012 N 7Th Ave	New River Az 85087
848	202 21 170	1.0		Bunten Earl Dean;Gladys I					45040 N 7Th St	Phoenix Az 85027
849	202 21 171	1.1		Sack William E;Stephanie L					45023 N 7Th St	Phoenix Az 85027
850	202 21 172	1.0		Black Thomas N;Comdu Amm					612 W Cavalry Rd	Phoenix Az 85027

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851	202 21 173	1.1		Nguyen Long Tan;Dav Thi					606 E Calavar Rd	Phoenix Az 85022
852	202 21 174	2.1		Korson Mary Elaine					582 E Calavar Rd	Phoenix Az 85022
853	202 21 175	4.7	James R Jr;Constance E	Maynard	(623) 465-				1107 E Villa Maria Dr	Phoenix Az 85022
854	202 21 176	4.6		Bierbaum Leon D;Ronda Y	(623) 465-5530		4526 W Lupine Ave	Glendale Az 85304	43244 N 7th Ave	New River Az 85087
855	202 21 N/A	0.5								
856	202 21 N/A	0.2								
857	202 21 N/A	0.2								
858	202 25 001B	4.2		Thompson Doyle Dean;Bobby Ann					49638 N 7Th Ave	New River Az 85027
859	202 25 001E	2.1		Crombie James R;Nancy A					3202 E Bell Rd #1031	Phoenix Az 85032
860	202 25 001F	2.6		Pfaff Garry L;Connie L					49739 N 11Th Ave	Phoenix Az 85027
861	202 25 001G	3.2		Mcclure Roy E;June M					*No Site Address*	Az
862	202 25 001H	0.3		Duerkop Gerald D;Pauline					49638 N 7Th Ave	Phoenix Az 85027
863	202 25 001M	5.4								
864	202 25 001N	1.5		Duerkop Gerald D;Pauline					*No Site Address*	Az
865	202 25 001P	2.8		Cvc Inc					*No Site Address*	Az
866	202 25 001V	1.8		Brodie Lawrence J;Lynn					1012 W Lazy K Ranch Rd	Phoenix Az 85027
867	202 25 001W	2.6		Brodie Lawrence J;Lynn					1012 W Lazy K Ranch Rd	Phoenix Az 85027
868	202 25 002	2.5		Thompson Doyle;Bobby Ann					49648 N 7Th Ave	Phoenix Az 85027
869	202 25 003D	9.3		Morkunas Edward M;Angela M					*No Site Address*	Az
870	202 25 003E	5.1		Johnson Thomas A;Maureen G					1019 E Oraibi Dr	Phoenix Az 85024
871	202 25 003F	5.2		Dodson Bob;Ann D					*No Site Address*	Az
872	202 25 003J	4.9		Lincoln Trust Co Custodian;Sands Gail					*No Site Address*	Az
873	202 25 003K	4.9		Konizeski Walter L					7036 E Hermosa Vista Dr	Mesa Az 85207
874	202 25 003L	5.2		Pence Michael J;Tauni R;Sandra E Farrand					49202 N 7Th Ave	Phoenix Az 85027
875	202 25 003M	4.8		Orion Trust					49210 N 7Th Ave	Phoenix Az 85027
876	202 25 004B	2.2		Duerkop Gerald D;Pauline					49406 N 7Th Ave	New River Az 85027
877	202 25 004C	1.2		Cowell Patsy Tomerlin					*No Site Address*	Az
878	202 25 004D	3.5		Ouse Andrea					49208 N 7Th Ave	New River Az 85027
879	202 25 004E	1.1		Cowell James A;Patsy A					*No Site Address*	Az
880	202 25 004F	3.4		Honsa Sharon Ann					49612 N 7Th Ave	Phoenix Az 85027
881	202 25 005C	5.1		Shell Daniel Stearns;Lezlie A					49234 N 17Th Ave	Phoenix Az 85027
882	202 25 005E	5.5		Ursutz Joseph E					49021 N 17Th Ave	Phoenix Az 85027
883	202 25 005G	2.6		Sokol Larry S;Sally E					49211 N 16Th Ave	Phoenix Az 85027
884	202 25 005H	2.4		Sokol Larry S;Sally E					*No Site Address*	Az
885	202 25 005J	4.8		Krantz Lawrence L;Carol M Tr					1525 W Lazy K Ranch Rd	Phoenix Az 85027
886	202 25 005M	4.4		Krantz Lawrence L;Carol M Tr					*No Site Address*	Az
887	202 25 005W	5.0		Lee Byron K					49031 N 13Th Ave	Phoenix Az 85027
888	202 25 005X	4.9		Sokol John J;Jeannette A					49036 N 15Th Ave	Phoenix Az 85027
889	202 25 005Y	4.9		Redshaw Opal R					49002 N 15Th Ave	New River Az 85027
890	202 25 006	4.9		Wilsey Mary Sue Tr					49211 N 13Th Ave	Phoenix Az 85027
891	202 25 007A	3.8		Ursutz Joseph E					49021 N 17Th Ave	Phoenix Az 85027
892	202 25 007B	2.5		Yeager James R;Nancy M					49212 N 17Th Ave	Phoenix Az 85027
893	202 25 008	2.4		Yeager James R;Nancy M					*No Site Address*	Az
894	202 25 009A	4.9		Brandon Robert L;Susan D					49212 N 13Th Ave	New River Az 85027
895	202 25 009C	1.7		Lewis Jr Roy E					49031 N 15Th Ave	Phoenix Az 85027
896	202 25 009D	1.4		Perrins Thomas W;Margaret L					49028 N 13Th Ave	Phoenix Az 85027
897	202 25 009F	0.2		Lewis Roy E Jr					*No Site Address*	Az
898	202 25 009G	0.2		Lewis Roy E Jr					*No Site Address*	Az
899	202 25 009H	1.3		Cibik Richard D;Sandra L					49018 N 13Th Ave	Phoenix Az 85027
900	202 25 010	4.5		Holroyd Glen;Leslie					49012 N 15Th Ave	Phoenix Az 85027
901	202 25 011	4.7		Abdin Ramsey					3625 W Wagoner Rd	Glendale Az 85308
902	202 25 012	4.6		Riegel Sr Charles H;Laura M					1620 W Lazy K Ranch Rd	Phoenix Az 85027
903	202 25 013A	12.2		Horabuena Sophia R					49626 N 16Th Ave	Phoenix Az 85027

APPENDIX B, TABLE B-1
SKUNK CREEK WATERCOURSE MASTER PLAN, PHASES 1 and 2
List of Property Ownership Information Sorted by TAG Number

TAG No. (1)	Assessors's Parcel Number (2)	Assessors's Parcel Area (3)	Name of Owner First (4)	Name of Owner Last (5)	Phone Number (6)	e-mail Address	Mailing Address 1 (7)	Mailing Address 2 (8)	Site Address 1 (9)	Site Adress 2 (10)
904	202 25 014	2.3		Flores Leonard Agustine					2551 N 60Th Ln	Phoenix Az 85035
905	202 25 015	2.4		Flores Leonard Agustine					49021 N 13Th Ave	Phoenix Az 85027
906	202 25 016A	10.3		Jensen Fred E					13427 N 1St St	Phoenix Az 85022
907	202 25 016B	4.8		Reese Cynthia A					49435 N 15Th Ave	Phoenix Az 85027
908	202 25 017A	1.8		Lewis Ronald G;Ula C					1432 W Lazy K Ranch Rd	Phoenix Az 85027
909	202 25 017B	1.7		Lewis Ronald G;Ula C					*No Site Address*	Az
910	202 25 017C	1.3		Lewis Ronald G;Ula C					*No Site Address*	Az
911	202 25 018	2.4		Seroka Paul J;Evaughn M					1215 W Lazy K Ranch Rd	Phoenix Az 85027
912	202 25 019	2.6		Klotz Cary R;Joyce R Tr					1115 W Lazy K Ranch Rd	Phoenix Az 85027
913	202 25 020	6.6		Enouen Albert John;Carolyn Louise					49636 N 15Th Ave	New River Az 85027
914	202 25 021A	3.9		Risner Roger A;Linda L Pozdoll					*No Site Address*	Az
915	202 25 021B	2.1		Enouen Albert John;Carolyn Louise					*No Site Address*	Az
916	202 25 021C	2.5		Kunath John					*No Site Address*	Az
917	202 25 021D	1.9		Carlson Robert E;Penny					1520 W Lazy K Ranch Rd	New River Az 85027
918	202 25 021E	1.9		Saunders Jr Hollis B;Rebecca A					49450 N 15Th Ave	New River Az 85027
919	202 25 022	2.4		Nay Gene;Paula A					1202 W Lazy K Ranch Rd	Phoenix Az 85027
920	202 25 023	2.5		Gonzales Edward					1116 W Lazy K Ranch Rd	New River Az 85027
921	202 25 024A	1.2		Kisil Nicholas;Mary Ann					*No Site Address*	Az
922	202 25 024B	1.2		Grigsby Timothy;Kimberly					49528 N 11Th Ave	New River Az 85027
923	202 25 024C	2.4		Grigsby Timothy;Kimberly					49528 N 11Th Ave	New River Az 85027
924	202 25 025B	1.5		Kinateder Michael J					49608 N 11Th Ave	New River Az 85027
925	202 25 025C	1.5		Huff Robert L;Nancy R					49624 N 11Th Ave	Phoenix Az 85027
926	202 25 025D	2.2		Blatnik Joseph D;Patricia I					1125 W Mingus Rd	Phoenix Az 85027
927	202 25 026	5.2		Battershall Edward Scott					*No Site Address*	Az
928	202 25 N/A	0.3								
929	211 50 016H	2.5		Birdsell Carl C; Russell L; Lois			11156 W Mountain View Drive	Sun City Az 85351	*No Site Address*	Az
930		802.8		State Of Arizona						
931		5918.1		State Of Arizona						

APPENDIX B, TABLE B-2
SKUNK CREEK WATERCOURSE MASTER PLAN, PHASES 1 and 2
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TAG No. (1)	Assessors's Parcel Number (2)	Parcel Area (3)	Name of Owner First (4)	Name of Owner Last (5)	Phone Number (6)	e-mail Address	Mailing Address 1 (7)	Mailing Address 2 (8)	Site Address 1 (9)	Site Adress 2 (10)
322	204 23 009G	5.9		ABAR PROPERTIES L			1707 E Highland Ave #190	Phoenix Az 85016	*No Site Address*	Phoenix Az
323	204 23 009F	28.5		ABAR PROPERTIES L			1707 E Highland Ave #190	Phoenix Az 85016	*No Site Address*	Phoenix Az
192	203 32 009D	1.5	John A & Beveri	Abbink			8540 W Avenida Del Sol	Peoria Az 85382	37834 N 19Th Ave	Phoenix Az 85027
901	202 25 011	4.7		Abdin Ramsey					3625 W Wagoner Rd	Glendale Az 85308
378	202 07 012	2.7		Akerson Irene					49239 N 7Th Ave	Phoenix Az 85027
616	202 21 024B	4.5	Daniel R. & Kathleen	Albert	(623) 465-5971				42745 N 7Th Ave	Phoenix Az 85027
694	202 21 046J	1.0		Albert Daniel R;Kathleen A					43011 N 7Th Ave	Phoenix Az 85027
830	202 21 154	4.9		Albillar Robert J;Lisa A					4319 W Zorillo	Az
239	204 11 001M	2.8	Asaad Ahmad E	Alsaad			PO Box 69	Safat	*No Site Address*	Phoenix Az
394	202 08 005F	5.2		Ames Paula Jannette					48614 N 3Rd St	Phoenix Az 85027
631	202 21 030D	2.4		Andersen Sidney W;Lisa M					43015 N 11Th Ave	Phoenix Az 85027
330	204 24 005Q	12.0	Patrick F & Ellen	Anderson			502 W Wood Dr	Phoenix Az 85029	*No Site Address*	Phoenix Az
705	202 21 049	8.7		Anderson Gladys F Tr					*No Site Address*	Az
447	202 09 013G	0.5		Anderson Richard E;Donna L					1059 W Wolftrap Rd	Phoenix Az 85027
659	202 21 036G	3.2		Andree Wallace D Jr;Vicki L					43825 N 3Rd Ave	Phoenix Az 85027
660	202 21 036H	0.0		Andree Wallace D Jr;Vicki L;Etal					43825 N 3Rd Ave	Phoenix Az 85027
1	211 22 003A	478.9		Anthem by Del Webb. Maryanne Kumiega	(623) 742-6107		3701 Anthem Way	Anthem AZ 85086	*No Site Address*	Az
2	211 22 003B	121.2		Anthem by Del Webb. Maryanne Kumiega	(623) 742-6107		3701 Anthem Way	Anthem AZ 85086	*No Site Address*	Az
9	211 86 001	636.6		Anthem by Del Webb. Maryanne Kumiega	(623) 742-6107		3701 Anthem Way	Anthem AZ 85086	*No Site Address*	Az
83	211 50 024	9.8	J	Anthony			485 Glencastle Dr Nw	Atlanta Ga 30327	*No Site Address*	Az
444	202 09 013D	9.6		Arizona Board Of Regents					*No Site Address*	Az
465	202 09 020A	1.8		Arizona Board Of Regents					*No Site Address*	Az
471	202 09 021A	8.2		Arizona Board Of Regents					*No Site Address*	Az
474	202 09 022D	3.8		Arizona Board Of Regents					*No Site Address*	Az
475	202 09 022E	1.0		Arizona Board Of Regents					*No Site Address*	Az
478	202 09 024	7.5		Arizona Board Of Regents					*No Site Address*	Az
479	202 09 025	10.4		Arizona Board Of Regents					*No Site Address*	Az
472	202 09 021B	0.9		Arizona Board Of Regents For Univ Of Az					*No Site Address*	Az
298	204 23 002B	20.0		ARIZONA LAND INCO			2999 N 44Th St #100	Phoenix Az 85018	*No Site Address*	Phoenix Az
703	202 21 048C	2.1		Ashley Hobert J Jr;Flora E					42806 N 3Rd Ave	Phoenix Az 85027
704	202 21 048D	2.6		Ashley Hobert John Jr;Flora E					*No Site Address*	Az
388	202 08 004B	10.2		Ashton June W					*No Site Address*	Az
433	202 09 010C	1.1		Ashton June W;Skipper D H Ashton					*No Site Address*	Az
172	203 32 014E	2.5	Tim E & Patti L	Atchley			PO Box 1269	Phoenix Az 85001	*No Site Address*	Az
488	202 09 029D	1.0		Atchley Brent W;Michelle A					48439 N 15Th Ave	New River Az 85027
699	202 21 046Q	0.0		Atkinson Bertha E					*No Site Address*	Az
698	202 21 046P	1.0		Atkinson Bertha Evelyn					43017 N 7Th Ave	Phoenix Az 85027
296	204 23 005E	14.9		AUSTRALIAN NATIVE			29035 N Black Canyon Hwy	Phoenix Az 85027	*No Site Address*	Phoenix Az
218	204 02 003A	80.4	Azar	Azar			3623 E Windmere Dr	Phoenix Az 85044	*No Site Address*	Phoenix Az
54	211 50 034F	3.1	Larry J & Sharo	Babcock			102 W Oraibi Dr	Phoenix Az 85027	102 W Oraibi Dr	Phoenix Az 85027
799	202 21 128	6.7		Babcock Richard N					44640 N Perdiz Dr	Phoenix Az 85027
139	211 50 014E	1.3	Robert Dean & D	Bado			38407 N 17Th Ave	Phoenix Az 85027	38407 N 17Th Ave	Phoenix Az 85027
234	204 02 004	121.9		BAHA PROPERTIES			4207 E Palo Verde Dr	Phoenix Az 85018	*No Site Address*	Phoenix Az
470	202 09 020J	0.3		Baile Dennie E;Joan M					*No Site Address*	Az
686	202 21 042R	2.4		Baker James C;Janet E					42845 N 7Th Ave	Phoenix Az 85027
731	202 21 069	4.4		Balsiger Herman L;Phyllis J					45024 N 6Th St	Phoenix Az 85027
481	202 09 026D	2.4		Banta Steve;Diana					1301 W New River Rd	Phoenix Az 85027
96	203 31 013B	4.7	Joyce	Barker			15852 Cliff Ave	White Rock	*No Site Address*	Az
819	202 21 145	5.0		Barnes J R;Carol J					*No Site Address*	Az
712	202 21 054	4.5		Barnes Larry L;Kathryn J					*No Site Address*	Az
81	211 50 025	9.9	John W & Sheila	Barto II			5523 W Park View Ln	Glendale Az 85310	*No Site Address*	Az
701	202 21 047	9.2		Bassett David J;Joella A Tr					*No Site Address*	Az
790	202 21 120B	5.1		Bates Clayton Reuel					44405 N New River Rd	Phoenix Az 85027

APPENDIX B, TABLE B-2
SKUNK CREEK WATERCOURSE MASTER PLAN, PHASES 1 and 2
List of Property Ownership Information Sorted by Last Name

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927	202 25 026	5.2		Battershall Edward Scott					*No Site Address*	Az
689	202 21 043	9.0		Bauer Richard A					43207 N 7Th Ave	Phoenix Az 85027
341	202 07 004C	3.8		Bayly Shawn J					*No Site Address*	Az
247	204 11 002E	29.0	Dds Nicholas P	Baziotes			7600 E Camelback Rd #3	Scottsdale Az 85251	*No Site Address*	Phoenix Az
86	203 31 009E	1.9	David	Bealer			38909 N 23Rd Ave	Phoenix Az 85027	38909 N 23Rd Ave	Phoenix Az 85027
173	203 33 010	10.1	Family Trust	Beck			11295 N 99Th Ave #521	Peoria Az 85345	*No Site Address*	Az
167	203 32 013C	2.2	Rodney Wayne	Beeman			40043 N 7Th St	Phoenix Az 85027	40043 N 7Th St	Phoenix Az 85027
502	202 16 003E	4.8		Bees Linda K					47201 N New River Rd	Phoenix Az 85027
132	203 32 007	9.8	Richard L	Belveal					*No Site Address*	Az
149	203 32 001A	20.3	Richard L	Belveal			12915 Foxglove Dr Nw	Gig Harbor Wa 98332	*No Site Address*	Az
294	204 24 002G	9.5	Randy F & Marlene	Berger			PO Box 142	Newton Ut 84327	*No Site Address*	Phoenix Az
854	202 21 176	4.6		Bierbaum Leon D;Ronda Y	(623) 465-5530		4526 W Lupine Ave	Glendale Az 85304	43244 N 7th Ave	New River Az 85087
929	211 50 016H	2.5	Carl C	Birdsell			11156 W Mtn View Dr	Sun City Az 85351	*No Site Address*	Az
776	202 21 109	4.6		Bishop Gary W;Pamela E					416 E Mano Dr	Phoenix Az 85027
791	202 21 121A	4.3		Bittick Robert J;Joy Marie					*No Site Address*	Az
850	202 21 172	1.0		Black Thomas N;Comdu Amm					612 W Cavalry Rd	Phoenix Az 85027
729	202 21 067	4.6		Blair Gary W;Linda J					412 E Sabrosa Dr	Phoenix Az 85027
375	202 07 009G	14.2		Blakely Pauline					*No Site Address*	Az
926	202 25 025D	2.2		Blatnik Joseph D;Patricia I					1125 W Mingus Rd	Phoenix Az 85027
213	203 38 009A	9.5	Battista J & Ma	Blessent			2526 E Elm St	Phoenix Az 85016	*No Site Address*	Az
134	211 50 014D	1.2	James R	Bliss			38425 N 17Th Ave	Phoenix Az 85027	38425 N 17Th Ave	Phoenix Az 85027
25	211 73 011B	4.7	Dale A & Lynett	Bohlander			40414 N 3Rd Ave	Phoenix Az 85027	40414 N 3Rd Ave	Phoenix Az 85027
56	211 50 028F	2.8	Richard D & Pat	Boone			3116 E Shea Blvd #236	Phoenix Az 85028	39040 N 11Th Ave	Phoenix Az 85027
58	211 50 028E	2.2	Richard D & Pat	Boone			3116 E Shea Blvd #236	Phoenix Az 85028	*No Site Address*	Az
358	202 07 006M	2.4		Borowski Bradly;Stephanie Sheets					49215 N 3Rd Ave #New	Phoenix Az 85027
122	211 50 030D	1.1	Joseph H & Cath	Bowers			1829 W Irvine Rd	Phoenix Az 85027	1829 W Irvine Rd	Phoenix Az 85027
590	202 21 013X	4.6		Bowers Arden L;Alice C					*No Site Address*	Az
715	202 21 057	5.1		Bowers Arden L;Alice C					*No Site Address*	Az
468	202 09 020G	2.1		Bowser Ronald A;Alpers Vicki V					47831 N 15Th Ave	Phoenix Az 85027
483	202 09 026G	1.2		Braden Patty Jo					43608 N Black Canyon Hwy #B	Phoenix Az 85027
524	202 16 007E	1.9		Bradner Stephen Martin;Melissa Kay					47012 N New River Rd	New River Az 85027
511	202 16 005E	5.4		Brakefield Benjamin Wade;Jacqueline F					47002 N New River Rd	Phoenix Az 85027
894	202 25 009A	4.9		Brandon Robert L;Susan D					49212 N 13Th Ave	New River Az 85027
761	202 21 098	4.3		Brasmer Scott J					104 W Sabrosa Dr	Phoenix Az 85027
243	204 11 001N	54.3	Ventires Llc	Britmet			2390 E Camelback Rd #438	Phoenix Az 85016	*No Site Address*	Phoenix Az
866	202 25 001V	1.8		Brodie Lawrence J;Lynn					1012 W Lazy K Ranch Rd	Phoenix Az 85027
867	202 25 001W	2.6		Brodie Lawrence J;Lynn					1012 W Lazy K Ranch Rd	Phoenix Az 85027
241	204 11 001K	2.7	Jerry A & Don Mat	Brookshire			2832 E Phelps Rd	Phoenix Az 85032	*No Site Address*	Phoenix Az
203	203 38 001F	4.1	Emery & Frankie	Brown			11611 N 50Th Ave	Glendale Az 85304	*No Site Address*	Az
594	202 21 015	9.9		Brown J Hoyt;Patricia V					*No Site Address*	Az
16	211 73 056	5.2	Jennifer Ann	Browne			422 W Marconi Ave	Phoenix Az 85023	*No Site Address*	Az
582	202 21 013F	9.6		Bruder William P;Joellen					44020 N Circle Mt Road New Riv	Az
69	211 50 034G	3.0	Daniel E & Andr	Brunson			39029 N 11Th Ave	Phoenix Az 85027	39029 N 11Th Ave	Phoenix Az 85027
163	203 33 017	1.3	Scott W & Tamar	Bruske			38215 N 24Th Ave	Phoenix Az 85027	38215 N 24Th Ave	85027 Az
757	202 21 094	4.6		Bubar David A;Veronica L					11 E Venado Dr	New River Az 85027
335	204 24 003H	10.1	Bullington Jr.	Bullington Jr.			3409 W Claremont St	Phoenix Az 85017	*No Site Address*	Phoenix Az
848	202 21 170	1.0		Bunten Earl Dean;Gladys I					45040 N 7Th St	Phoenix Az 85027
592	202 21 014A	4.3		Burch Rita					*No Site Address*	Az
125	211 50 014J	2.4	Newton & Barbar	Burk			1619 W Irvine Rd	Phoenix Az 85027	1619 W Irvine Rd	Phoenix Az 85027
405	202 08 007F	4.9		Burnett Terry O					14848 N 33Rd Pl	Phoenix Az 85032
644	202 21 031W	4.5		Bushong Linda A					43434 N 7Th Ave	Phoenix Az 85027
775	202 21 108	5.2		Byerly David J;Patricia Ann					312 E Mano Dr	Phoenix Az 85027
448	202 09 013J	5.6		Byrne Nicole W					47421 N New River Rd	Phoenix Az 85027

APPENDIX B, TABLE B-2
SKUNK CREEK WATERCOURSE MASTER PLAN, PHASES 1 and 2
List of Property Ownership Information Sorted by Last Name

TAG No. (1)	Assessors's Parcel Number (2)	Assessors's Parcel Area (3)	Name of Owner First (4)	Name of Owner Last (5)	Phone Number (6)	e-mail Address	Mailing Address 1 (7)	Mailing Address 2 (8)	Site Address 1 (9)	Site Adress 2 (10)
449	202 09 013K	3.9		Byrne Nicole W					47421 N New River Rd	New River Az 85027
758	202 21 095	4.4		Cain Doran;Kathleen R					45439 N New River Rd	Phoenix Az 85027
622	202 21 026	9.5		Caldis Niki					*No Site Address*	Az
647	202 21 032A	4.7		Caldwell David L;Carol A	(623) 465-7670				43750 N 3Rd Ave	New River Az 85087
796	202 21 125	6.5		Calhoun Mark A Sr;Betty A					44612 N New River Rd	Phoenix Az 85027
722	202 21 061H	1.0		Calica Melissa A					45007 N 6Th St	Phoenix Az 85027
19	211 73 057C	1.5	William N & Dor	Canfield			PO Box 4362	Cave Creek Az 85327	40600 N 3Rd Ave	Phoenix Az 85027
40	211 50 011D	3.1	Joe & Shelley	Cantelme			1601 W Desert Hills Dr	Phoenix Az 85027	*No Site Address*	Az
51	211 50 011C	1.8	Salvatore J & D	Cantelme II			524 W San Juan Ave	Phoenix Az 85013	*No Site Address*	Az
217	204 02 001E	68.9		CANYON INVESTORS			11411 N Tatum Blvd	Phoenix Az 85028	*No Site Address*	Phoenix Az
219	204 02 001D	8.9		CANYON INVESTORS					*No Site Address*	Phoenix Az
223	204 02 001C	2.3		CANYON INVESTORS			11411 N Tatum Blvd	Phoenix Az 85028	*No Site Address*	Phoenix Az
232	204 02 002B	79.7		CANYON INVESTORS			11411 N Tatum Blvd	Phoenix Az 85028	*No Site Address*	Phoenix Az
233	204 02 002A	80.2		CANYON INVESTORS			11411 N Tatum Blvd	Phoenix Az 85028	*No Site Address*	Phoenix Az
684	202 21 042P	4.6		Caperton Robert W;Marsha J					43226 N 3Rd Ave	Phoenix Az 85027
207	203 38 006	10.4	Ernestine G	Carey			701 W Herbert Ave #64	Reedley Ca 93654	*No Site Address*	Az
208	203 38 005	9.9	Ernestine G	Carey			701 W Herbert Ave #64	Reedley Ca 93654	*No Site Address*	Az
917	202 25 021D	1.9		Carlson Robert E;Penny					1520 W Lazy K Ranch Rd	New River Az 85027
832	202 21 156	5.2		Carson Billy J;Debra Ann					45419 N Zorrillo Dr	Phoenix Az 85027
182	203 32 012G	1.2	Robert L & Judi	Cascio			PO Box 4215	Cave Creek Az 85327	*No Site Address*	Az
150	203 32 013F	2.0	Alan Joseph	Caylor			38252 N 19Th Ave	Phoenix Az 85027	38252 N 19Th Ave	Phoenix Az 85027
151	203 32 013E	2.6	Billy D & Glady	Caylor			PO Box 1969	Cave Creek Az 85327	*No Site Address*	Az
676	202 21 041C	2.4		Caylor James B;Ann L					43701 N 1St Dr	New River Az 85027
52	203 31 001G	2.2	James V & Linda	Caywood			2005 Arthur St	Wichita Falls Tx 76309	*No Site Address*	Az
39	211 50 011A	4.5	James H & Phyll	Cherry Jr.			15430 N 30Th St	Phoenix Az 85032	*No Site Address*	Az
252	204 11 002G	39.9	Ronald & Sue	Cheuvront			3334 E Sells Dr	Phoenix Az 85018	*No Site Address*	Phoenix Az
629	202 21 029B	5.0		Chevallier Jean-Yves P;Marie R					43000 N 11Th Ave	New River Az 85027
282	204 24 004A	29.1		CHI CONSTRUCTION			7001 N Scottsdale Rd #20	Scottsdale Az 85253	*No Site Address*	Phoenix Az
312	204 24 003D	46.7		CHI CONSTRUCTION			7001 N Scottsdale Rd #20	Scottsdale Az 85253	*No Site Address*	Phoenix Az
313	204 24 003J	10.1		CHI CONSTRUCTION			7001 N Scottsdale Rd #20	Scottsdale Az 85253	*No Site Address*	Phoenix Az
314	204 24 003M	10.2		CHI CONSTRUCTION			7001 N Scottsdale Rd #20	Scottsdale Az 85253	*No Site Address*	Phoenix Az
326	204 24 003L	12.7		CHI CONSTRUCTION			7001 N Scottsdale Rd #20	Scottsdale Az 85253	*No Site Address*	Phoenix Az
333	204 24 005F	14.9		CHI CONSTRUCTION			7001 N Scottsdale Rd #20	Scottsdale Az 85253	*No Site Address*	Phoenix Az
334	204 24 003F	65.4		CHI CONSTRUCTION			7001 N Scottsdale Rd #20	Scottsdale Az 85253	*No Site Address*	Phoenix Az
186	203 33 004	10.1	Norman E & Meli	Childress			2324 W Joy Ranch Rd	Phoenix Az 85027	2324 W Joy Ranch Rd	Phoenix Az 85027
407	202 08 007J	4.7		Childress Norman;Melinda E					48415 N 7Th Ave	Phoenix Az 85027
406	202 08 007H	5.0		Childress Ralph N					48415 N 7Th Ave	Phoenix Az 85027
414	202 08 419	5.4		Childress Ralph;Lynda					48625 N Fig Springs Rd	Phoenix Az 85027
899	202 25 009H	1.3		Cibik Richard D;Sandra L					49018 N 13Th Ave	Phoenix Az 85027
473	202 09 022C	4.6		Cicala Frank;Childress Lynda Sue					48239 N 15Th Ave	Phoenix Az 85027
467	202 09 020F	1.0		Ciezadlo Mark R;Valerie A					47808 N Fig Springs Rd	New River Az 85027
194	203 32 009E	1.6	Randall W & Fel	Clark			8510 W Avenida Del Sol	Peoria Az 85382	37828 N 19Th Ave	Phoenix Az 85027
755	202 21 092	4.6		Clark Gustav H;Karla R					108 E Venado Dr	Phoenix Az 85027
131	203 32 010A	4.9	Michael Lee & L	Collins			326 W Topeka Dr	Phoenix Az 85027	*No Site Address*	Az
837	202 21 162	1.0		Conder Margaret L Tr					*No Site Address*	Az
645	202 21 031Y	2.3		Conley Joe Reese;Dorothy Louise					*No Site Address*	Az
675	202 21 041B	4.7		Conway Deborah					22233 N 23Rd Ave	Phoenix Az 85027
145	203 33 001Y	1.3	Paul D	Cook			PO Box 41103	Phoenix Az 85080	38348 N 23Rd Ave	Phoenix Az 85027
155	203 33 001Z	1.3	Paul & Yescavag	Cook			PO Box 41103	Phoenix Az 85080	*No Site Address*	Az
746	202 21 084	4.3		Cook Valerie J					45629 N 6Th St	Phoenix Az 85027
111	203 31 014B	4.9	Corydon Michael	Cooley			PO Box 2080	Show Low Az 85902	*No Site Address*	Az
112	203 31 007B	5.1	Coyden & Patric	Cooley			PO Box 2080	Show Low Az 85902	*No Site Address*	Az
577	202 21 008B	2.0		Coombs Joseph H;Rose E Tr					7350 E Stetson Dr #105	Scottsdale Az 85251

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SKUNK CREEK WATERCOURSE MASTER PLAN, PHASES 1 and 2
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TAG No. (1)	Assessors's Parcel Number (2)	Assessors's Parcel Area (3)	Name of Owner First (4)	Name of Owner Last (5)	Phone Number (6)	e-mail Address	Mailing Address 1 (7)	Mailing Address 2 (8)	Site Address 1 (9)	Site Adress 2 (10)
806	202 21 133	4.6		Coombs Joseph H;Rose E Tr					*No Site Address*	Az
709	202 21 052	5.1		Coplen Jeanne Elise					822 E Virginia Ave	Phoenix Az 85006
763	202 21 100	4.4		Corbett Chris					13 W Sabrosa Dr	Phoenix Az 85027
516	202 16 006E	2.4		Corrick Marvin;Andrea					*No Site Address*	Az
26	211 73 016	5.0	Azar	Corson			4538 W Cinnabar Ave	Glendale Az 85302	*No Site Address*	Az
751	202 21 088	4.5		Cossey Michael C;Susan G					*No Site Address*	Az
748	202 21 086	4.8		Cottam Loraine J;Christine					45431 N 6Th St #New	Phoenix Az 85027
879	202 25 004E	1.1		Cowell James A;Patsy A					*No Site Address*	Az
877	202 25 004C	1.2		Cowell Patsy Tomerlin					*No Site Address*	Az
673	202 21 040A	4.5		Crandell Raymond;Connie					211 W Circle Mountain Rd	Phoenix Az 85027
720	202 21 061E	0.9		Crane Myron E;Betty A					11222 N 84Th St	Scottsdale Az 85260
523	202 16 007C	2.2		Crawford James M;Rosemary E					47030 N 14Th Ave	Phoenix Az 85027
828	202 21 152	5.1		Crawford John Paul;Ellen Marie					44837 N Zorrillo Dr	Phoenix Az 85027
412	202 08 008C	1.8		Cray Land Co Inc					*No Site Address*	Az
413	202 08 008C	0.2		Cray Land Co Inc					*No Site Address*	Az
10	211 73 003S	16.5	Garland	Crews			5035 E North Regency Cir	Tucson Az 85711	40809 N 7Th Ave	Phoenix Az 85027
22	211 73 015C	2.0	Garland G	Crews			5035 E North Regency Cir	Tucson Az 85711	506 W Azure Hills Dr	Phoenix Az 85027
23	211 73 015B	1.2	Garland G	Crews			5035 E North Regency Cir	Tucson Az 85711	*No Site Address*	Az
24	211 73 015A	1.5	Garland G	Crews			5035 E North Regency Cir	Tucson Az 85711	*No Site Address*	Az
321	204 23 009E	48.9		Crimmins Family Trust					*No Site Address*	Phoenix Az
324	204 23 009W	1.0		Crimmins Family Trust					*No Site Address*	Phoenix Az
325	204 23 009V	10.0		Crimmins Family Trust					*No Site Address*	Phoenix Az
332	204 23 009U	92.9		Crimmins Family Trust					*No Site Address*	Phoenix Az
859	202 25 001E	2.1		Crombie James R;Nancy A					3202 E Bell Rd #1031	Phoenix Az 85032
617	202 21 025B	4.8		Culp Oscar A;Peggy J					*No Site Address*	Az
841	202 21 164C	1.2		Cunningham Victor Leslie					43202 N 11Th Ave	Phoenix Az 85027
573	202 21 006R	1.0		Curmatureanu Ion;Cornelia					*No Site Address*	Az
574	202 21 006R	8.1		Curmatureanu Ion;Cornelia					*No Site Address*	Az
543	202 16 012P	1.5		Currey Albert Ben;Angela Denise					46631 N 11Th Ave	Phoenix Az 85027
545	202 16 012S	1.4		Currey Albert Ben;Angela Denise					46631 N 11Th Ave	Phoenix Az 85027
782	202 21 115	5.2		Curtis David W;Vicki S					511 E Mano Dr	New River Az 85027
669	202 21 039A	4.5		Cuthbertson Dennis E;Kathryn R					19234 N 5Th Pl	Phoenix Az 85024
670	202 21 039C	2.3		Cuthbertson Dennis;Kathryn					*No Site Address*	Az
865	202 25 001P	2.8		Cvc Inc					*No Site Address*	Az
804	202 21 132A	2.5		Dagburg L L C					*No Site Address*	Az
805	202 21 132B	2.8		Dagburg L L C					44620 N Shangri La Ln	New River Az 85027
205	203 38 001S	3.4	Roland & Betty	Dahl			8808 N 106Th Ln	Peoria Az 85345	*No Site Address*	Az
206	203 38 001R	1.2	Mark A & Betty	Dail			8808 N 106Th Ln	Peoria Az 85345	36616 N 27Th Ave	Phoenix Az 85027
185	203 32 005B	1.3	Robert J & Diane L.	Damer			37906 N 21St Ave	New River, AZ 85086	37906 N 21St Ave	New River, AZ 85086
190	203 32 003B	5.1	Arline	Damer			PO Box 1382	Phoenix Az 85001	37906 N 21St Ave	Phoenix Az 85027
374	202 07 009F	5.8		Daniel Thomas M;Maria H					49440 N 2Nd Ave	Phoenix Az 85027
610	202 21 020E	1.0		Darby Trust					8650 E Montebello Ave	Scottsdale Az 85250
484	202 09 027A	0.8		Darrow Janice L;Peter					48405 N 15Th Ave	Phoenix Az 85027
548	202 16 012V	3.5		Davidson Marion J;Susan J					*No Site Address*	Az
549	202 16 012V	1.6		Davidson Marion J;Susan J					*No Site Address*	Az
550	202 16 012V	0.0		Davidson Marion J;Susan J					*No Site Address*	Az
33	211 50 009F	1.2	Michael A & Jud	Davis					*No Site Address*	Az
640	202 21 031R	0.7		Davis Wm G;Rose Mary					*No Site Address*	Az
349	202 07 005U	0.9		Dean Linda K;Via Wilton C					49011 N 7Th Ave	Phoenix Az 85027
736	202 21 074	4.7		Decker Joseph Murray;Alberta Cross Tr					Unknown	Az
742	202 21 080	4.2		Defreyn Yves J;Helene					204 E Venado Dr	Phoenix Az 85027
87	203 31 009H	1.6	Darin L	Deherrera			4337 W Acoma Dr	Glendale Az 85306	4337 W Acoma Dr	Glendale Az 85306
166	203 32 013D	2.5	James E	Dekarske			7162 N 56Th Ave #A	Glendale Az 85301	38222 N 19Th Ave	Phoenix Az 85027

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529	202 16 009	3.2		Deleano Tony;Antoinette B					*No Site Address*	Az
533	202 16 010R	0.1		Deleano Tony;Antoinette B					*No Site Address*	Az
534	202 16 010S	0.1		Deleano Tony;Antoinette B					*No Site Address*	Az
264	204 13 003C	41.0		DESERT BISCUIT FL			4434 E Camelback Rd #134	Phoenix Az 85018	*No Site Address*	Phoenix Az
116	211 50 015C	2.2		DESERT HILLS INESTMENT CO LLC			PO Box 4071	Springfield Mo 65808	*No Site Address*	Az
839	202 21 164A	2.4		Desio Richard J;Phyllis					*No Site Address*	Az
101	211 50 029	8.7	Daniel Brian &	Diaz			PO Box 1374	Phoenix Az 85001	38625 N 17Th Ave	Phoenix Az 85027
871	202 25 003F	5.2		Dodson Bob;Ann D					*No Site Address*	Az
760	202 21 097	4.7		Dominic Donald S;Jeanette L					124 E Sabrosa Dr	Phoenix Az 85027
716	202 21 058	4.9		Donaghy Samuel E					43633 N 13Th Ave	New River Az 85027
831	202 21 155	4.9		Donaldson David;Mary Lou					4419 S Elm St	Tempe Az 85282
769	202 21 105B	0.1		Dosselman Barbara					102 E Mano Dr	Phoenix Az 85027
434	202 09 010K	1.4		Dowell Michael L;Susan H					48045 N Fig Springs Rd	New River Az 85027
435	202 09 010K	0.4		Dowell Michael L;Susan H					48045 N Fig Springs Rd	New River Az 85027
183	203 32 012H	2.2	Donnie	Drake			PO Box 5525	Carefree Az 85377	*No Site Address*	Az
811	202 21 138	3.7		Drevs Richard Jr;Margaret S Tr					37035 N 17Th Ave	Phoenix Az 85027
836	202 21 161	0.5		Drevs Richard Jr;Margaret S Tr					*No Site Address*	Az
862	202 25 001H	0.3		Duerkop Gerald D;Pauline					49638 N 7Th Ave	Phoenix Az 85027
864	202 25 001N	1.5		Duerkop Gerald D;Pauline					*No Site Address*	Az
876	202 25 004B	2.2		Duerkop Gerald D;Pauline					49406 N 7Th Ave	New River Az 85027
204	203 38 001E	8.6	Clifford L & Je	Dwyer			4319 W Ocotillo Rd	Glendale Az 85301	*No Site Address*	Az
300	204 24 002F	9.7		DYNAMITE 45 PROPE			10225 W Thunderbird Blvd	Sun City Az 85351	*No Site Address*	Phoenix Az
303	204 24 002K	9.4		DYNAMITE 45 PROPE			10225 W Thunderbird Blvd	Sun City Az 85351	*No Site Address*	Phoenix Az
328	204 24 005R	4.7		DYNAMITE 45 PROPE			10225 W Thunderbird Blvd	Sun City Az 85351	*No Site Address*	Phoenix Az
663	202 21 037A	6.7		Eardley Edward John;Jo Anne A					211 W Leann Ln	New River Az 85027
501	202 16 003D	9.9		Eastin Ronald C;Ann E Tr					*No Site Address*	Az
503	202 16 003K	2.6		Eastman Donald D Jr;Deborah K					19419 N 8Th Pl	Phoenix Az 85024
810	202 21 137	4.8		Eischens Jeanie A					45034 N Zorrillo Dr	Phoenix Az 85027
585	202 21 013R	9.2	Jeanie	Eller	(623) 465-0195	(623) 465-0274 fax	PO Box 4944	Cave Creek AZ 85327	42828 N 7Th Ave	New River AZ 85087
683	202 21 042N	1.3		Emerson Dale					*No Site Address*	Az
913	202 25 020	6.6		Enouen Albert John;Carolyn Louise					49636 N 15Th Ave	New River Az 85027
915	202 25 021B	2.1		Enouen Albert John;Carolyn Louise					*No Site Address*	Az
602	202 21 017D	1.7		Erb Robert;Audrey					43828 N 13Th Ave	Phoenix Az 85027
268	204 13 001G	9.1	Patrick J & Lorra	Evans			2872 Coast Cir #301	Huntington Beach Ca 92649	*No Site Address*	Phoenix Az
143	211 50 003J	2.6	Anita Margaret	Evenson			2445 Brant St #501	San Diego Ca 92101	*No Site Address*	Az
152	211 50 003M	2.6	Anita Margaret	Evenson			2445 Brant St #501	San Diego Ca 92101	*No Site Address*	Az
161	211 50 003K	2.5	Jeannette Marjo	Evenson			2445 Brant St #501	San Diego Ca 92101	*No Site Address*	Az
169	211 50 003P	2.5	Jeannette Major	Evenson			2445 Brant St #501	San Diego Ca 92101	*No Site Address*	Az
176	203 32 012F	3.3	Barbara L	Fair					*No Site Address*	Az
752	202 21 089	5.0		Fallenveck Eberhardt G;Nancy B					313 E Venado Dr	Phoenix Az 85027
227	204 01 004B	40.5	Azar	Farahmand			3623 E Windmere Dr	Phoenix Az 85044	*No Site Address*	Phoenix Az
230	204 01 007	40.3	Azar	Farahmand			3623 E Windmere Dr	Phoenix Az 85044	*No Site Address*	Phoenix Az
231	204 01 003	40.6	Azar	Farahmand			3623 E Windmere Dr	Phoenix Az 85044	*No Site Address*	Phoenix Az
554	202 16 013G	2.2		Farley E Merrill;Farley Sara Allyne Tr					46640 N 13Th Ave	New River Az 85027
759	202 21 096	5.2		Farley Mary F;Maciver Duncan I					45417 N New River Rd	New River Az 85027
431	202 09 009D	4.9		Farris Ronald C;Maudie M					48410 N 7Th Ave	Phoenix Az 85027
29	211 73 003Q	2.6	Michael Robert	Feldman			9971 N 128Th St	Scottsdale Az 85259	*No Site Address*	Az
209	203 38 010C	5.1	Holdings L L C	Feldman			3200 N Central Ave #700	Phoenix Az 85012	*No Site Address*	Az
210	203 38 010E	5.4	Holdings L L C	Feldman			3200 N Central Ave #700	Phoenix Az 85012	*No Site Address*	Az
211	203 38 010D	28.3	Ira S & Susan B	Feldman			3200 N Central Ave #700	Phoenix Az 85012	*No Site Address*	Az
753	202 21 090C	4.9		Fetters Stephen D;Nancy A					227 E Venado Dr	Phoenix Az 85027
840	202 21 164B	1.0		Fields Larry;Rose					*No Site Address*	Az
291	204 24 004B	50.3		FIRST AMERICAN TI			111 W Monroe St	Phoenix Az 85003	*No Site Address*	Phoenix Az

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586	202 21 013T	2.3		Fisher James Michael					*No Site Address*	Az
512	202 16 005F	5.3		Fitts John W;Cora R Burgess					*No Site Address*	Az
290	204 24 002B	14.8	John R & Silvia R	Fleitz			1517 W Libby St	Phoenix Az 85023	*No Site Address*	Phoenix Az
904	202 25 014	2.3		Flores Leonard Agustine					2551 N 60Th Ln	Phoenix Az 85035
905	202 25 015	2.4		Flores Leonard Agustine					49021 N 13Th Ave	Phoenix Az 85027
416	202 09 005	0.8		Foglesong Dusty Aaron					47807 N 15Th Ave	New River Az 85027
66	203 31 002A	5.0	Patrick K & Syl	Foley			7952 La Cosa Dr	Dallas Tx 75248	*No Site Address*	Az
67	203 31 002C	2.2	J Michael	Foley			7125 E Lincoln Dr	Scottsdale Az 85253	*No Site Address*	Az
77	203 31 002D	2.2	Patrick K	Foley			7952 La Cosa Dr	Dallas Tx 75248	*No Site Address*	Az
138	203 32 008E	5.0	J Michael	Foley			7125 E Lincoln Dr	Scottsdale Az 85253	*No Site Address*	Az
365	202 07 007J	4.8		Fowler Sr Albert F;Demetra F					49459 N 7Th Ave	Phoenix Az 85027
421	202 09 006M	3.9		Fox Kenneth Leroy;Sherry A					4113 W Fig Springs Rd	Phoenix Az 85029
88	203 31 009G	1.7	James F & Dana	Frandrup			3406 W Acoma Dr	Phoenix Az 85053	3406 W Acoma Dr	Phoenix Az 85053
181	203 33 008E	1.1	Francine L	Freitag			38015 N 25Th Ave	Phoenix Az 85027	38015 N 25Th Ave	Phoenix Az 85027
113	203 31 007A	5.0	Odette Marie	Fuller			PO Box 400	Whiteriver Az 85941	*No Site Address*	Az
595	202 21 016D	2.4		Funk Donna M					43426 N 7Th Ave	Phoenix Az 85027
596	202 21 016G	1.7		Funk Donna M					43415 N 13Th Ave #New	Phoenix Az 85027
584	202 21 013M	9.4		Funk Donna M;Proulx Bradley E			43426 N 7Th Ave	New River Az 85087	43426 N 7Th Ave	New River Az 85087
159	211 50 048H	1.3	Sue Carol	Fyke			2123 W Surrey Ave	Phoenix Az 85029	*No Site Address*	Az
491	202 09 031A	3.5		Gagnon Trust					47608 N 9Th Ave	Phoenix Az 85027
266	204 13 001R	3.0	Thomas W & Claudi	Gamble			3454 Kimberly Rd	Cameron Park Ca 95682	*No Site Address*	Phoenix Az
813	202 21 140	4.0		Garcia Ernest G;Kulina Paula M					*No Site Address*	Az
17	211 73 057B	2.5	Sharon	Garman			40604 N 3Rd Ave	Phoenix Az 85027	40604 N 3Rd Ave	Phoenix Az 85027
714	202 21 056	2.3		Gary G Dabney Trust					44020 N 7Th Ave	Phoenix Az 85027
115	203 31 003	9.2	James W & Robin	Gavin			1111 E Stella Ln	Phoenix Az 85014	*No Site Address*	Az
766	202 21 103	5.4		Gavin Robert Edward Sr					44827 N New River Rd	Phoenix Az 85027
41	211 50 015A	9.0	Jeffery E & Marilynn	Gellerman			22238 N 90Th Ave	Peoria Az 85382	1537 W Desert Hills Dr	Phoenix Az 85027
311	204 23 006B	1.2	George	George			36622 N Lazy Ln	Carefree Az 85377	*No Site Address*	Phoenix Az
588	202 21 013V	4.8		George Laurel L					43442 N 13Th Ave	Phoenix Az 85027
818	202 21 144	3.8		George T;Kris E Pingitore Trust					33840 N Cave Creek Rd	Cave Creek Az 85331
6	211 22 002J	3.0	Sharon K	Geraci	H (623) 465-2687, cell (623) 363-1395		PMB, 47515 E. Carefree Hwy	Phoenix AZ 85085	705 W Honda Bow Rd	New River Az 85086
7	211 22 002H	2.0	Sharon K	Geraci	H (623) 465-2687, cell (623) 363-1395		PMB, 47515 E. Carefree Hwy	Phoenix AZ 85085	705 W Honda Bow Rd	New River Az 85086
628	202 21 029A	4.8		Gieselman Janet;Kinney Susan					*No Site Address*	Az
127	203 32 008J	1.3	Mario V & Jean	Giorda			272 Meadowview Dr	Torrington Ct 06790	2243 W Irvine Rd	Phoenix Az 85027
179	203 33 008C	2.4	Robert & Adele	Girmendonk			38025 N 25Th Ave	Phoenix Az 85027	38025 N 25Th Ave	Phoenix Az 85027
803	202 21 131	5.3		Glass Timothy A;Judy R					*No Site Address*	Az
439	202 09 011D	6.9		Goetz Frederick J					*No Site Address*	Az
920	202 25 023	2.5		Gonzales Edward					1116 W Lazy K Ranch Rd	New River Az 85027
390	202 08 004G	2.4		Goreham Beverley A Tr					*No Site Address*	Az
391	202 08 004H	2.2		Goreham Beverley A Tr					*No Site Address*	Az
657	202 21 036D	1.7		Goveia Richard A;Roberta Lynn					43819 N 3Rd Ave	New River Az 85027
717	202 21 060	4.6		Grabach George J;Ruth J					224 E Sabrosa Dr	New River Az 85027
740	202 21 078	3.9		Grabosky William;Grace					14 E Venado Dr	Phoenix Az 85027
620	202 21 025F	1.2		Grace Marion C					42815 N 11Th Ave	New River Az 85027
621	202 21 025G	1.3		Grace William Cecil Ii					*No Site Address*	3 Az
417	202 09 006G	2.0		Grant Curtis Jay;Doris Jean					49030 N 7Th Ave	Phoenix Az 85027
411	202 08 008B	2.0		Grant Elizabeth Sue					621 W Mingus Rd	New River Az 85027
678	202 21 042D	4.6		Gregg George R Iii;Julie					42805 N 7Th Ave	Phoenix Az 85027
744	202 21 082	4.6		Grenier Lucien G;Audrey C					314 E Venado Dr	Phoenix Az 85027
395	202 08 005J	7.9		Greve Richard M					*No Site Address*	Az
725	202 21 063	4.7		Greve Robert E;Frances M					102 E Sabrosa Dr #Phx	Phoenix Az 85027
922	202 25 024B	1.2		Grigsby Timothy;Kimberly					49528 N 11Th Ave	New River Az 85027
923	202 25 024C	2.4		Grigsby Timothy;Kimberly					49528 N 11Th Ave	New River Az 85027

APPENDIX B, TABLE B-2
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827	202 21 151	5.4		Griswold Kirk Jay					44805 N Zorrillo Dr	Phoenix Az 85027
184	203 32 012C	1.3	Michael	Grootegoed			38018 N 19Th Ave	Phoenix Az 85027	38018 N 19Th Ave	Phoenix Az 85027
551	202 16 013B	10.1		Groves Carl E					46641 N 13Th Ave	Phoenix Az 85027
651	202 21 033A	4.8		Groves Carl E					44625 N 14Th St	Phoenix Az 85027
726	202 21 064	4.5		Guenther Jacob;Justina					*No Site Address*	Az
553	202 16 013F	2.6		Gunnison Robert H;Vonie J					46630 N 13Th Ave	Phoenix Az 85027
423	202 09 007B	9.8		Gustavsen Carl;Beatrice M					*No Site Address*	Az
817	202 21 143B	0.8		Hafler Evelyn M;Lehman Sandra J					4444 N 32Nd St	Phoenix Az 85018
823	202 21 147B	2.4		Hafler Evelyn M;Lehman Sandra J					*No Site Address*	Az
393	202 08 004K	9.8		Hagen Peter F					*No Site Address*	Az
664	202 21 037C	1.1		Hall Robert A;Sandra L					43411 N 3Rd Ave	Phoenix Az 85027
144	211 50 048K	4.3	Family Trust	Hamby			PO Box 1387	Phoenix Az 85001	*No Site Address*	Az
154	211 50 048L	1.1	Darrin Ray & De	Hamby			8650 N 35Th Ave #109	Phoenix Az 85051	*No Site Address*	Az
518	202 16 006H	2.3		Hammond Joel Wayne					*No Site Address*	Az
532	202 16 010Q	0.5		Hammond Thelma L					*No Site Address*	Az
767	202 21 104	5.6		Hanson Linda Sue;Alan D Pribble					44805 N New River Rd #New	Phoenix Az 85027
244	204 11 002D	30.2	Dds Gordon L	Hardy			7600 E Camelback Rd # 4	Scottsdale Az 85251	*No Site Address*	Phoenix Az
575	202 21 007A	20.5		Hare Investments Ltd Prtnrsp					*No Site Address*	Az
566	202 21 005L	1.0		Harford Kathleen					45045 N 6Th St	Phoenix Az 85027
667	202 21 038A	4.8		Harkins Dennis R;Sierra Sue					115 W Leann Ln	Phoenix Az 85027
98	211 50 016F	1.1	Willis E	Harper			38821 N 17Th Ave	New River Az 85027	*No Site Address*	Az
84	211 50 016J	6.5	Willis E	Harper			38821 N 17Th Ave	New River Az 85027	*No Site Address*	Az
288	204 23 004	36.7		HARRIS BLACK CANY			6263 N Scottsdale Rd #10	Scottsdale Az 85250	*No Site Address*	Phoenix Az
297	204 23 006A	20.5		HARRIS BLACK CANY			6263 N Scottsdale Rd #10	Scottsdale Az 85250	*No Site Address*	Phoenix Az
345	202 07 005M	5.7		Harris Thomas John					49240 N 3Rd Ave	Phoenix Az 85027
364	202 07 007H	4.9		Harris Thomas John					*No Site Address*	Az
812	202 21 139	4.6		Harton David B;Barbara E O					*No Site Address*	Az
404	202 08 007E	5.2		Harvey Wesley R					48457 N 7Th Ave	Phoenix Az 85027
623	202 21 027A	4.6		Haynes Lewis L Iii;Margaret A					*No Site Address*	Az
536	202 16 010X	1.3		Hayward Margaret Ann					47240 N 13Th Ave	Az
677	202 21 041D	2.6		Head Francis O;Frances V					43702 N Central Ave	Phoenix Az 85027
643	202 21 031U	4.6		Hearne Charles P;L S Henscheid					*No Site Address*	Az
110	203 31 014A	5.1	Shawn	Heath			625 S Westwood #175	Mesa Az 85210	38605 N 23Rd Ave	Phoenix Az 85027
376	202 07 010	8.7		Hegre Adolf;Malene;Mary;Anderson James L					49012 N 3Rd Ave	New River Az 85027
418	202 09 006J	1.3		Hennessy William T;Dena C					48606 N 7Th Ave	Phoenix Az 85027
429	202 09 009A	0.5		Hennessy William T;Dena C					*No Site Address*	Az
641	202 21 031S	2.3		Henscheid Lawrence Steve					*No Site Address*	Az
642	202 21 031T	2.6		Henscheid Lawrence Steve					43605 N 7Th Ave	Phoenix Az 85027
558	202 16 015E	1.9		Henslee Lawrence V					47206 N New River Rd	New River Az 85027
571	202 21 006N	10.1		Hess Joseph A;Sondra J Tr					530 E Circle Mountain Rd	Phoenix Az 85027
814	202 21 141	4.7		Hilburn Joan L;Dean R					*No Site Address*	Az
815	202 21 142	5.3		Hilburn Joan L;Dean R					427 W Pontiac Dr #2	Phoenix Az 85027
816	202 21 143A	3.6		Hilburn Joan L;Dean R					*No Site Address*	Az
105	211 50 027	9.9	Lee R & Sharon	Hilton			1440 W Irvine Rd	Phoenix Az 85027	1440 W Irvine Rd	Phoenix Az 85027
727	202 21 065	4.8		Hineman Timothy Earl;Bateman Toni S					230 E Sabrosa Dr	Phoenix Az 85027
847	202 21 169	4.5	Joe E & Claudia M	Hines	(623) 465-7200		43012 N 7th Ave	New River AZ 85087	43012 N 7Th Ave	New River Az 85087
350	202 07 005W	1.4		Hines Jason P;Susan J					514 W Mingus Rd	Az
607	202 21 020A	4.8		Hirt David J					43818 N 11Th Ave	Phoenix Az 85027
46	203 31 001H	4.6	Terry Lynn	Hollan			PO Box 1294B	Phoenix Az 85001	*No Site Address*	Az
682	202 21 042M	3.0		Holliday Glen L					PO Box 659 Black Cyn S	Az
900	202 25 010	4.5		Holroyd Glen;Leslie					49012 N 15Th Ave	Phoenix Az 85027
880	202 25 004F	3.4		Honsa Sharon Ann					49612 N 7Th Ave	Phoenix Az 85027
62	211 50 022	9.6	Family Trust	Hopwood			39030 N. 15th Avenue	New River AZ 85086	39030 N 15Th Ave	New River AZ 85086

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903	202 25 013A	12.2		Horabuena Sophia R					49626 N 16Th Ave	Phoenix Az 85027
743	202 21 081C	4.6		Horton Lloyd A;Mary A					228 E Venado Dr	Phoenix Az 85027
117	211 50 037D	4.6	Edwin Eugene &	Hospelhorn			24432 N 89Th Ave	Peoria Az 85382	*No Site Address*	Az
61	211 50 016B	10.0	Joseph P & Elsi	Hsu			3223 Heatherfield Ct	Newbury Park Ca 91320	*No Site Address*	Az
809	202 21 136	4.7		Hudson Harvey C;Christine M					45006 N Zorrillo Dr	Phoenix Az 85027
925	202 25 025C	1.5		Huff Robert L;Nancy R					49624 N 11Th Ave	Phoenix Az 85027
129	203 32 008G	2.3	George & Jane M	Huntley			20257 N 10Th Ave	Phoenix Az 85027	20257 N 10Th Ave	Phoenix Az 85027
347	202 07 005P	4.7		Iben Pennie K					49214 N 3Rd Ave	Phoenix Az 85027
476	202 09 023C	1.9		Ilicin Alexander;Shirley Jean					48403 N 15Th Ave	New River Az 85027
477	202 09 023D	0.3		Ilicin Alexander;Shirley Jean					*No Site Address*	Az
593	202 21 014B	4.4		Ilijasic Gino;Bruna					*No Site Address*	Az
212	203 38 004	10.3	Anna Harris	Ingber			4220 Colfax Ave #115	Studio City Ca 91604	*No Site Address*	Az
319	204 23 009R	53.0		INTERSTATE 17 INV			3232 Cobb Pkwy #315	Atlanta Ga 30339	*No Site Address*	Phoenix Az
598	202 21 016J	1.9		Inukai George;Kerry					43419 N 11Th Ave	Phoenix Az 85027
48	211 50 009D	1.1	James A & Mary	Ivey			1000 Granada Ct	Virginia Beach Va 23456	*No Site Address*	Az
493	202 09 031D	1.3		Jardine Kathleen					916 W Wolftrap Rd	New River Az 85027
308	204 23 002D	9.9	David D	Jarvis			151 Fraser Ave	Santa Monica Ca 90405	*No Site Address*	Phoenix Az
309	204 23 002C	10.3	David D	Jarvis			151 Fraser Ave	Santa Monica Ca 90405	*No Site Address*	Phoenix Az
655	202 21 035A	1.6		Jenkins Robert L;Virginia A					44126 N 3Rd Ave	New River Az 85027
656	202 21 035B	7.5		Jenkins Robert L;Virginia A					*No Site Address*	Az
91	203 31 013A	4.7	Clifford P & Ro	Jennings			220 W Bell Rd #1011	Phoenix Az 85023	39000 N 19Th Ave	Phoenix Az 85027
348	202 07 005S	1.0		Jennings Barbara Victoria					49213 N 7Th Ave	New River Az 85027
906	202 25 016A	10.3		Jensen Fred E					13427 N 1St St	Phoenix Az 85022
685	202 21 042Q	2.2		Jensen Jason R					42939 N 7Th Ave	Phoenix Az 85027
11	211 73 003X	4.9	Walter G & Dian	Johnson			515 W Rockaway Hills Rd	Phoenix Az 85027	515 W Rockaway Hills Rd	Phoenix Az 85027
870	202 25 003E	5.1		Johnson Thomas A;Maureen G					1019 E Oraibi Dr	Phoenix Az 85024
20	211 73 003U	1.0	Kevin Hastings	Jones			PO Box 145	Cave Creek Az 85327	*No Site Address*	Az
21	211 73 011A	5.0	Kevin H & Lois	Jones			PO Box 145	Cave Creek Az 85327	*No Site Address*	Az
60	211 50 028C	9.8	David R & Patri	Jones			16024 N 23Rd Pl	Phoenix Az 85022	*No Site Address*	Az
199	203 38 007	4.5	Joann K	Jones			2513 Via De Pallon Cir	Henderson Nv 89014	*No Site Address*	Az
570	202 21 006M	5.1		Jordan David K					604 W Circle Mountain Rd #A	Phoenix Az 85027
50	211 50 007B	2.2	Ray H & Jean M	Jorgensen			4444 E Wescott Dr	Phoenix Az 85050	39206 N 11Th Ave	Phoenix Az 85027
688	202 21 042T	1.3		Jospeh Susan					*No Site Address*	Az
652	202 21 033B	4.9		Jutson Reece A;Wilda Larose Tr					43909 N Central Ave	Phoenix Az 85027
797	202 21 126	5.9		Kafka Stephen P;Pamela					44648 N New River Rd	Phoenix Az 85027
505	202 16 003M	1.3		Karns Victor N;Andrea F					47205 N New River Rd	Phoenix Az 85027
397	202 08 005L	6.2		Kempinski Bernard P;Rita					107 E Mingus Rd	Phoenix Az 85027
739	202 21 077	5.1		Kerr Jack Edward;Betty Jo					12 E Venado Dr	Phoenix Az 85027
95	203 31 009D	2.5	Daniel R & Sher	Kibler Sr.			3507 W Carefree Hwy	Phoenix Az 85027	38805 N 23Rd Ave	Phoenix Az 85027
130	203 32 010B	4.9	Wyona B & Alva	Kimbrel			1529 W Desert Cv	Phoenix Az 85029	2137 W Irvine Rd	Phoenix Az 85027
924	202 25 025B	1.5		Kinateder Michael J					49608 N 11Th Ave	New River Az 85027
921	202 25 024A	1.2		Kisil Nicholas;Mary Ann					*No Site Address*	Az
912	202 25 019	2.6		Klotz Cary R;Joyce R Tr					1115 W Lazy K Ranch Rd	Phoenix Az 85027
630	202 21 030A	4.9		Klug Sande					43041 N 11Th Ave	Phoenix Az 85027
845	202 21 167B	2.3		Klusek Andrew P					43203 N 11Th Ave	Phoenix Az 85027
780	202 21 113	4.8		Knight Ernest L;Marita R					44603 N 6Th St	Phoenix Az 85027
195	203 32 003A	5.0	Robert D & Maud	Knox			PO Box 4830	Cave Creek Az 85327	*No Site Address*	Az
696	202 21 046L	1.1		Koestel Lea S;Gwen					43009 N 7Th Ave	Phoenix Az 85027
873	202 25 003K	4.9		Konizeski Walter L					7036 E Hermosa Vista Dr	Mesa Az 85207
258	204 13 001J	10.2	William B & Eva D	Koors			818 W Butler Dr	Phoenix Az 85021	*No Site Address*	Phoenix Az
265	204 13 001H	8.7	William B & Eva D	Koors			818 W Butler Dr	Phoenix Az 85021	*No Site Address*	Phoenix Az
852	202 21 174	2.1		Korson Mary Elaine					582 E Calavar Rd	Phoenix Az 85022
695	202 21 046K	1.2		Koskovich Michael A;Tawnya D					43001 N 7Th Ave	New River Az 85027

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632	202 21 030E	0.9		Kovach Craig L					*No Site Address*	Az
220	204 01 005A	39.7	Family L L C	Kramer			5550 N Yucca Rd	Paradise Valley Az 85253	*No Site Address*	Phoenix Az
235	204 01 002	40.1	Family L L C	Kramer			5550 N Yucca Rd	Paradise Valley Az 85253	*No Site Address*	Phoenix Az
236	204 01 001	80.3	Family L L C	Kramer			5550 N Yucca Rd	Paradise Valley Az 85253	*No Site Address*	Phoenix Az
278	204 13 004E	19.0	Family L L C	Kramer			5550 N Yucca Rd	Paradise Valley Az 85253	*No Site Address*	Phoenix Az
885	202 25 005J	4.8		Krantz Lawrence L;Carol M Tr					1525 W Lazy K Ranch Rd	Phoenix Az 85027
886	202 25 005M	4.4		Krantz Lawrence L;Carol M Tr					*No Site Address*	Az
578	202 21 008S	1.3		Kraus Investments L C					46834 N Shangri La Ln	New River Az 85027
579	202 21 008T	36.4		Kraus Investments L C					46834 N Shangri La Ln	New River Az 85027
635	202 21 031E	9.0		Kraus Investments Lc					*No Site Address*	Az
28	211 73 013	5.0	James J & Judit	Kropid			12 Wild Dunes Ct	Las Vegas Nv 89113	*No Site Address*	Az
916	202 25 021C	2.5		Kunath John					*No Site Address*	Az
702	202 21 048A	4.6		Kwiatkowski Craig;Cheryl					42838 N 3Rd Ave	Phoenix Az 85027
591	202 21 013Z	5.0		La Moure Steve Michael;Joan E					1114 W Circle Mountain Rd	New River Az 85027
747	202 21 085	4.7		Lachance Gregory;Cheryl					45615 N 7Th St	Phoenix Az 85027
609	202 21 020D	1.0		Laird David Allen;Janet					*No Site Address*	Az
723	202 21 061J	1.3		Lama Carol A					45005 N 6Th St	New River Az 85027
119	211 50 030C	1.3	Larry G & Debra	Lambertus			1837 W Irvine Rd	Phoenix Az 85027	1837 W Irvine Rd	Phoenix Az 85027
824	202 21 148	4.8		Lambeth Harold R;Marilyn L					45048 N New River Rd	Phoenix Az 85027
732	202 21 070	5.0		Lamoure Roger D;Joanne K Tr					*No Site Address*	Az
708	202 21 051	4.8		Lamoure Steven M;Joan E					*No Site Address*	Az
354	202 07 006F	2.0		Lamprecht Michael E;Sally A					3025 W New River Rd #1	Phoenix Az 85027
463	202 09 019B	4.4		Lanagan Ronald James;Helen Elaine Tr					1331 W New River Rd	Phoenix Az 85027
273	204 13 004G	4.8		LANDMARK AMERICAN			4990 Austell Powder Spri	Austell Ga 30106	*No Site Address*	Phoenix Az
274	204 13 004D	5.2		LANDMARK AMERICAN			4990 Austell Powder Spri	Austell Ga 30106	*No Site Address*	Phoenix Az
808	202 21 135	4.8		Lang Marjorie E					44830 N Zorrillo Dr	New River Az 85027
360	202 07 006P	1.1		Lann Nellie Yvonne					49224 N 1St Ave	Phoenix Az 85027
544	202 16 012R	1.6		Laorr Anan K;Eileen					*No Site Address*	Az
396	202 08 005K	5.4		Lasher Brian L;Sheri L					*No Site Address*	Az
707	202 21 050B	4.2		Law Bruce T;Ruth C					*No Site Address*	Az
251	204 11 001C	39.9	Thomas C	Law III			7505 E 6Th Ave #100	Scottsdale Az 85251	*No Site Address*	Phoenix Az
842	202 21 165	2.2		Law Michael L;Valys U					*No Site Address*	Az
843	202 21 166	2.6		Law Michael L;Valys U					*No Site Address*	Az
844	202 21 167A	2.6		Law Michael L;Valys U					43203 N 11Th Ave	Phoenix Az 85027
114	203 31 005A	5.1	Raymond D & Nan	Lawhorn			38715 N 21St Ave #1	Phoenix Az 85027	38715 N 21St Ave #1	Phoenix Az 85027
49	211 50 009B	1.2	Kenneth J & Lau	Lawless			5012 W Avalon Dr	Phoenix Az 85031	*No Site Address*	Az
778	202 21 111	5.1		Layton Frances K					4770 New Riv	Az
785	202 21 118	4.9		Lds Church Of Jesus Christ					*No Site Address*	Az
38	211 50 012	9.2	Ronald & Phylli	Lee			1725 W Desert Hills Dr	Phoenix Az 85027	1725 W Desert Hills Dr	Phoenix Az 85027
78	211 50 026A	9.9	Lawrence Arthur	Lee			38827 N 11Th Ave	Phoenix Az 85027	38827 N 11Th Ave	Phoenix Az 85027
80	211 50 026C	2.5	Gary Lawrence &	Lee			38838 N 11Th Ave	Phoenix Az 85027	38833 N 11Th Ave	Phoenix Az 85027
887	202 25 005W	5.0		Lee Byron K					49031 N 13Th Ave	Phoenix Az 85027
359	202 07 006N	1.0		Leiler Robert Gale					49226 N 1St Ave	Phoenix Az 85027
735	202 21 073	4.6		Levin Bradley R					105 E Sabrosa Dr	Phoenix Az 85027
895	202 25 009C	1.7		Lewis Jr Roy E					49031 N 15Th Ave	Phoenix Az 85027
908	202 25 017A	1.8		Lewis Ronald G;Ula C					1432 W Lazy K Ranch Rd	Phoenix Az 85027
909	202 25 017B	1.7		Lewis Ronald G;Ula C					*No Site Address*	Az
910	202 25 017C	1.3		Lewis Ronald G;Ula C					*No Site Address*	Az
897	202 25 009F	0.2		Lewis Roy E Jr					*No Site Address*	Az
898	202 25 009G	0.2		Lewis Roy E Jr					*No Site Address*	Az
492	202 09 031C	4.6		Ley Timothy G;Nadine					47636 N 9Th Ave	Phoenix Az 85027
872	202 25 003J	4.9		Lincoln Trust Co Custodian;Sands Gail					*No Site Address*	Az
196	203 32 009B	4.5	John T & John T	Lindholtz Sr.			1721 E Winter Dr	Phoenix Az 85020	*No Site Address*	Az

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242	204 11 001J	2.6	Richard J & Nancy	Llanes			2410 W Keim Dr	Phoenix Az 85015	*No Site Address*	Phoenix Az
292	204 24 002J	4.3	Richard J & Nancy	Llanes			2410 W Keim Dr	Phoenix Az 85015	*No Site Address*	Phoenix Az
293	204 24 002H	4.6	Richard J & Nancy	Llanes			2410 W Keim Dr	Phoenix Az 85015	*No Site Address*	Phoenix Az
310	204 24 002L	9.4	Richard J & Nancy	Llanes			2410 W Keim Dr	Phoenix Az 85015	*No Site Address*	Phoenix Az
286	204 24 006E	48.7		L-MAR INVESTMENT			3232 Cobb Pkwy #315	Atlanta Ga 30339	*No Site Address*	Phoenix Az
287	204 23 011	77.7		L-MAR INVESTMENT			3232 Cobb Pkwy #315	Atlanta Ga 30339	*No Site Address*	Phoenix Az
254	204 11 002K	10.3		LONE MOUNTAIN ROA			2312 W Northern Ave	Phoenix Az 85021	*No Site Address*	Phoenix Az
255	204 11 002L	10.1		LONE MOUNTAIN ROA			2312 W Northern Ave	Phoenix Az 85021	*No Site Address*	Phoenix Az
257	204 11 002J	20.2		LONE MOUNTAIN ROA			2312 W Northern Ave	Phoenix Az 85021	*No Site Address*	Phoenix Az
519	202 16 006J	2.1		Lopez Manuel R;Mary J					46809 N 13Th Ave	Phoenix Az 85027
59	211 50 017B	5.0	Ellis & Jean	Lorimor			8005 W Patrick Ln	Peoria Az 85382	Not Available	Az
734	202 21 072C	4.6		Lund Anthony;Cheryl L					201 E Sabrosa Dr	Phoenix Az 85027
615	202 21 024A	4.2		Lund Wayne E			PO Box 613	Carlin Nv 89822	*No Site Address*	Az
272	204 13 004H	68.2		MADISON GRANITE S			PO Box 5805	Carefree Az 85377	*No Site Address*	Phoenix Az
277	204 13 004F	10.0		MADISON GRANITE S			PO Box 5805	Carefree Az 85377	*No Site Address*	Phoenix Az
279	204 13 004J	47.6		MADISON GRANITE S			PO Box 5805	Carefree Az 85377	*No Site Address*	Phoenix Az
280	204 13 004K	2.3		MADISON GRANITE S			PO Box 5805	Carefree Az 85377	*No Site Address*	Phoenix Az
177	203 32 012E	1.3	Donald P & Barb	Maggiore			38106 N 19Th Ave	Phoenix Az 85027	38106 N 19Th Ave	Phoenix Az 85027
12	211 73 005	5.1	Richard S & Vir	Malatin			9445 N 7Th Ave	Phoenix Az 85021	40414 N 3Rd Ave	Phoenix Az 85027
13	211 73 004	4.8	Richard S & Vir	Malatin			9445 N 7Th Ave	Phoenix Az 85021	*No Site Address*	Az
619	202 21 025E	1.1		Manley Carl L;Nancy L					42889 N 11Th Ave	Phoenix Az 85027
750	202 21 087D	0.5		Mano Inc					*No Site Address*	Az
128	203 32 008H	1.2	David J & Donna	Manthey			5730 W Glenrosa Ave	Phoenix Az 85031	2233 W Irvine Rd	Phoenix Az 85027
415	202 09 004	0.8		Maricopa County					*No Site Address*	Az
576	202 21 007B	19.0		Maricopa County					26 W Circle Mountain Rd	Phoenix Az 85027
794	202 21 123	5.6		Maricopa County					*No Site Address*	Az
795	202 21 124	5.5		Maricopa County					44202 N New River Rd	Phoenix Az 85027
329	204 23 009T	29.9		MARICOPA COUNTY F			3335 W Durango St	Phoenix Az 85009	*No Site Address*	Phoenix Az
336	204 24 005S	16.7		MARICOPA COUNTY F			3335 W Durango St	Phoenix Az 85009	*No Site Address*	Phoenix Az
572	202 21 006Q	9.6		Maricopa County State Of Arizona					*No Site Address*	Az
793	202 21 122	4.7		Maricopa County State Of Arizona					*No Site Address*	Az
367	202 07 007L	2.3		Marti Katrina A					49451 N 7Th Ave	Phoenix Az 85027
371	202 07 009C	10.3		Marti Katrina A					49451 N 7Th Ave	Phoenix Az 85027
687	202 21 042S	1.0		Martin Margaret L					43006 N 3Rd Ave	New River Az 85027
338	204 23 009D	1.5	Jackson A & Merce	Mason			1138 E Northview Ave	Phoenix Az 85020	*No Site Address*	Phoenix Az
380	202 08 001A	5.1		Mason G Elly					*No Site Address*	Az
381	202 08 001C	4.8		Mason G Elly					*No Site Address*	Az
107	211 50 020C	5.3	Curtis J & Mari	Masters			1610 W Irvine Rd	Phoenix Az 85027	1632 W Irvine Rd	Phoenix Az 85027
821	202 21 146B	2.8		Mata Stacey M					45418 N New River Rd	New River Az 85027
504	202 16 003L	1.5		Mathews Sandra					47207 N New River Rd	Phoenix Az 85027
71	211 50 017A	4.8	Billy D & Joan	Mathis			39020 N 17Th Ave	Phoenix Az 85027	39020 N 17Th Ave	Phoenix Az 85027
104	211 50 037C	5.2	Tim & Tammy R	Mathis	(623) 465-8731	timandtam@qwest.net	38640 N 17Th Ave	New River, AZ 85086	38640 N 17Th Ave	New River, AZ 85086
156	203 32 014D	2.6	Leland E	Mathis			PO Box 1268	Phoenix Az 85001	*No Site Address*	Az
820	202 21 146A	1.6		Matta Stacey M					*No Site Address*	Az
764	202 21 101	4.3		Mayer Robert Allen;Diana					103 W Sabrosa Dr	Phoenix Az 85027
853	202 21 175	4.7	James R Jr;Constance E	Maynard	(623) 465-				1107 E Villa Maria Dr	Phoenix Az 85022
469	202 09 020H	1.0		Maynard Steve F;Kelly Wells					47828 N Fig Springs Rd	New River Az 85027
784	202 21 117	4.8		Mc Call Pamela A;David L					203 E Mano Dr	Phoenix Az 85027
674	202 21 040B	4.9		Mcallister Paul H;Ann					201 W Circle Mountain Rd	New River Az 85027
35	211 50 007A	2.2	Kathleen J	McCartney			PO Box 42642	Phoenix Az 85080	*No Site Address*	Az
197	203 38 001P	3.6	Jason	McClure			2145 W Williams Dr	Phoenix Az 85027	2145 W Williams Dr	Phoenix Az 85027
861	202 25 001G	3.2		Mcclure Roy E;June M					*No Site Address*	Az
400	202 08 005Q	3.2		Mcclure Roy E;Marie K Tr					135 E Mingus Rd	Phoenix Az 85027

APPENDIX B, TABLE B-2
SKUNK CREEK WATERCOURSE MASTER PLAN, PHASES 1 and 2
List of Property Ownership Information Sorted by Last Name

TAG No. (1)	Assessors's Parcel Number (2)	Parcel Area (3)	Name of Owner First (4)	Name of Owner Last (5)	Phone Number (6)	e-mail Address	Mailing Address 1 (7)	Mailing Address 2 (8)	Site Address 1 (9)	Site Adress 2 (10)
419	202 09 006K	1.0		Mccord Richard F;Jacque R					48646 N 7Th Ave	Phoenix Az 85027
514	202 16 006B	5.1		Mccormick Leon Joe;Betty Sue;Dave					3525 W Photo View Rd	Az
741	202 21 079	3.9		Mcculley Johnny Dee					106 E Venado Dr	Phoenix Az 85027
430	202 09 009C	4.8		Mcgee Jack W;Joyce A					48224 N 7Th Ave	New River Az 85027
135	211 50 014F	1.2	William C & Jac	McGriff			501 W Sequoia Dr	Phoenix Az 85027	*No Site Address*	Az
140	211 50 014G	1.4	William C & Jac	McGriff Sr.			9232 N 2Nd Ave	Phoenix Az 85021	38405 N 17Th Ave	Phoenix Az 85027
82	211 50 016E	4.5	David J	McHenry			PO Box 9356	Phoenix Az 85068	1718 W Maryland Ave	Phoenix Az 85015
92	211 50 016D	4.6	David J	McHenry			PO Box 9356	Phoenix Az 85068	1718 W Maryland Ave	Phoenix Az 85015
221	204 01 006L	10.2	David J	McHenry			PO Box 9356	Phoenix Az 85068	*No Site Address*	Phoenix Az
222	204 01 006G	20.7	David J	McHenry			PO Box 9356	Phoenix Az 85068	*No Site Address*	Phoenix Az
224	204 01 006F	9.1	David J	McHenry			PO Box 9356	Phoenix Az 85068	*No Site Address*	Phoenix Az
226	204 01 006H	18.4	David J	McHenry			PO Box 9356	Phoenix Az 85068	*No Site Address*	Phoenix Az
228	204 01 006J	10.0	David J	McHenry			PO Box 9356	Phoenix Az 85068	*No Site Address*	Phoenix Az
229	204 01 006K	10.2	David J	McHenry			PO Box 9356	Phoenix Az 85068	*No Site Address*	Phoenix Az
170	203 33 018	1.3	Terry M & Susan	McIver Jr.			38211 N 24Th Ave	Phoenix Az 85027	38211 N 24Th Ave	85027 Az
5	211 22 002B	2.5	James F & Kasey L	McKeag	H (623) 465-5222, cell (602) 743-5338		515 E Carefree Hwy. #311	Phoenix AZ 85085	755 W Honda Bow Rd	New River AZ 85086
552	202 16 013E	2.6		Mckinley Donald W;Dorothy J					46635 N 15Th Ave	Phoenix Az 85027
30	211 73 003R	2.7	James P & Shell	McLaughlin			4343 W Creedance Blvd	Glendale Az 85310	4343 W Creedance Blvd	Glendale Az 85310
382	202 08 002A	1.1		Mclellan Donald Charles;Marlene K					*No Site Address*	Az
357	202 07 006L	2.9		Mcmaster David Wayne					*No Site Address*	Az
681	202 21 042K	2.4		Mcneela James Stephen Tr					*No Site Address*	Az
18	211 73 057A	1.2	Patrick Robert	Meenan			PO Box 1363	Carefree Az 85377	*No Site Address*	Az
164	203 33 001U	1.3	Joseph H & Mari	Meier			926 Cleveland St #A212	Greenville Sc 29601	*No Site Address*	Az
171	203 33 001V	1.3	David E & Lilli	Meintel			38204 N 23Rd Ave	Phoenix Az 85027	38204 N 23Rd Ave	Phoenix Az 85027
175	203 32 005C	4.9	Margaret H	Melvin	(623) 465-7922		38026 N 21St Ave	Phoenix Az 85027	*No Site Address*	Az
178	203 32 005D	3.9	Margaret H	Melvin			PO Box 1382-K	Phoenix Az 85001	38026 N 21St Ave	Phoenix Az 85027
355	202 07 006G	0.9		Meyer Edward A;Sandra L Tr					*No Site Address*	Az
356	202 07 006J	3.9		Meyer Edward A;Sandra L Tr					49227 N 3Rd Ave	Phoenix Az 85027
32	211 50 009G	1.3	Robert L & Lind	Milby Sr.			PO Box 201843	Anchorage Ak 99520	*No Site Address*	Az
137	211 50 030A	4.3	Timothy K & Cyn	Miller			240 E Helena Dr	Phoenix Az 85022	38405 N 19Th Ave	Phoenix Az 85027
779	202 21 112	4.8		Miller Floyd H;Diana L					44635 N 6Th St	Phoenix Az 85027
614	202 21 023	8.8		Miller Jean A					*No Site Address*	Az
661	202 21 036L	1.6		Miller Jeffrey B;Maureen M					43829 N 3Rd Ave	Phoenix Az 85027
455	202 09 017C	1.2		Miner Stacey L;Colleen A					48540 N Fig Springs Rd	Phoenix Az 85027
331	204 23 009S	23.1	Minnesota	Minnesota Title & Trust			3232 Cobb Pkwy #315	Atlanta Ga 30339	*No Site Address*	Phoenix Az
57	211 50 021A	2.4	Mark & Ellen	Miraldi			16625 N 34Th Dr	Phoenix Az 85053	*No Site Address*	Az
559	202 16 016B	2.5		Mitcham Tom E;Sarah J					47000 N New River Rd	Phoenix Az 85027
515	202 16 006D	2.2		Moody Clarence D Jr;Christine A					46812 N 13Th Ave #Phoeni	Phoenix Az 85027
829	202 21 153	5.0		Moore Michael D;Darcy L					45025 N Zorrillo Dr	Phoenix Az 85027
869	202 25 003D	9.3		Morkunas Edward M;Angela M					*No Site Address*	Az
482	202 09 026F	1.3		Morris Terri Lee Stevens					47470 N 13Th Ave	New River Az 85027
200	203 38 008C	2.3	Solomon O & Pri	Muniz			10734 W Laurelwood Ln	Avondale Az 85323	*No Site Address*	Az
201	203 38 008A	1.1	Solomon O & Pri	Muniz			10734 W Laurelwood Ln	Avondale Az 85323	*No Site Address*	Az
202	203 38 008B	1.4	Solomon O & Pri	Muniz			10734 W Laurelwood Ln	Avondale Az 85323	36841 N 29Th Ave	Phoenix Az 85027
724	202 21 062	4.4		Murphy Terence T;Marchand Lucille I					45203 N 6Th St	Phoenix Az 85027
118	203 31 005B	4.9	Eugene V	Murray			507 Cherry Ln	Glenview Il 60025	38615 N 23Rd Ave	Phoenix Az 85027
773	202 21 107	4.9		Mutschler Marcia Sue					520 E Mano Dr	Phoenix Az 85027
599	202 21 016K	1.3		Nabors Ken J;Shirley G					43426 N 7Th Ave	Phoenix Az 85027
733	202 21 071	4.8		Nagel Donna L					229 E Sabrosa Dr	Phoenix Az 85027
919	202 25 022	2.4		Nay Gene;Paula A					1202 W Lazy K Ranch Rd	Phoenix Az 85027
344	202 07 005D	3.8		Neely David L;Sherri L					445 W County Rd	Az
537	202 16 010Y	1.1		Nelsen Thomas R					4040 W Peoria Ave #2080	Phoenix Az 85029
436	202 09 010S	1.6		Netzley Robert H					48025 N Fig Springs Rd	Phoenix Az 85027

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437	202 09 010T	2.7		Netzley Robert H					PO Box 4090	Az
480	202 09 026B	4.8		New River Bible Chapel;School					*No Site Address*	Az
706	202 21 050A	4.7		Newby Keith Walter;Law-Newby Donna					520 W Honda Bow Rd	Phoenix Az 85027
851	202 21 173	1.1		Nguyen Long Tan;Dav Thi					606 E Calavar Rd	Phoenix Az 85022
36	211 50 007C	4.2	Paul & Marilyn	Nicholson	(623) 465-8710	(623) 465-5064	39019 N. 15th Ave.	Cave Creek Az 85087	39019 N. 15th Ave.	Cave Creek Az 85087
102	211 50 018	10.0	Paul A & Marily	Nicholson	(623) 465-8710		609 Pass Creek Rd	Parkman Wy 82838	1148 W Irvine Rd	Phoenix Az 85027
369	202 07 008D	2.6		Nicholson Paul J;Nancy L					*No Site Address*	Az
370	202 07 008E	2.3		Nicholson Paul J;Nancy L					*No Site Address*	Az
539	202 16 012K	1.3		Nickerson Dorothy					46609 N New River Rd	Phoenix Az 85027
372	202 07 009D	4.4		Nicoloff Nicholas A;Mary Ann					49440 N Central Ave	New River Az 85027
346	202 07 005N	4.7		Nielson Robert L;Ann M					49229 N 7Th Ave	Phoenix Az 85027
697	202 21 046M	1.3		Nies Samuel					43009 N 7Th Ave	Phoenix Az 85027
648	202 21 032D	3.0		Norris Dean U;Juanita					43610 N 3Rd Ave	Phoenix Az 85027
269	204 13 001U	29.7		NOVAK FAMILY L L			7050 NW Grand Ave	Glendale Az 85301	*No Site Address*	Phoenix Az
259	204 13 001T	70.4	The	Novak Family Llc			7050 NW Grand Ave	Glendale Az 85301	*No Site Address*	Phoenix Az
270	204 13 003B	39.3		NOVAK FAMILY LLC			PO Box 5805	Carefree Az 85377	*No Site Address*	Phoenix Az
42	203 31 008A	4.4	Doug D	Ockinga			336 N Elm St	Red Cloud NE 68970	2225 W Desert Hills Dr	Phoenix Az 85027
700	202 21 046R	1.0		Oconnor Robert H					*No Site Address*	Az
728	202 21 066	5.2		Olmsted Ransford K;Sharon A					314 E Sabrosa Dr	Phoenix Az 85027
567	202 21 005M	0.9		Olszewski Mark					*No Site Address*	Az
875	202 25 003M	4.8		Orion Trust					49210 N 7Th Ave	Phoenix Az 85027
878	202 25 004D	3.5		Ouse Andrea					49208 N 7Th Ave	New River Az 85027
351	202 07 005Z	1.3		Palmer Charles W;Valeri A					49119 N 7Th Ave	Phoenix Az 85027
490	202 09 029G	1.0		Palmer Gail L;Linda C Tr					1309 W Roughrider Rd	Phoenix Az 85027
453	202 09 017A	5.1		Palushock Richard					48418 N Fig Springs Rd	Phoenix Az 85027
97	203 31 006B	5.0	Steven B & Juli	Panizek			PO Box 41398	Phoenix Az 85080	38811 N 21St Ave	Phoenix Az 85027
148	203 32 006	10.2	Patricia E	Parks			3002 W Muriel Dr	Phoenix Az 85053	38210 N 21St Ave	Phoenix Az 85027
55	211 50 034J	0.5	Rochelle L	Parrish			3902 N 11Th St	Phoenix Az 85014	*No Site Address*	Az
826	202 21 150	3.9		Parry Michael K;Debra T					44833 N Shangri La Ln	Phoenix Az 85027
65	203 31 001E	5.0	E Arthur	Patterson			7508 N 13Th Ave	Phoenix Az 85021	*No Site Address*	Az
85	211 50 023	10.4	Gerald E & Shar	Pearson			5230 W Fallen Leaf Ln	Glendale Az 85310	*No Site Address*	Az
44	203 31 012A	4.0	Rosina L	Pedersen					*No Site Address*	Az
43	203 31 008B	4.3	Gerald E P & Ro	Pedersen Jr.			Hc 4 1276-B 2215 W Des	Phoenix Az 85027	2215 W Desert Hills Dr	Phoenix Az 85027
53	203 31 012B	5.0	Gerald E & Rosi	Pedersen Jr.					*No Site Address*	Az
64	203 31 011A	5.2	Gerald E & Rosi	Pedersen Jr.					*No Site Address*	Az
75	203 31 011B	5.1	Gerald E & Rosi	Pedersen Jr.					*No Site Address*	Az
385	202 08 003F	3.4		Peebles Beverly J					48903 N 7Th Ave	Phoenix Az 85027
389	202 08 004D	5.1		Peebles Beverly J					48919 N Fig Springs Rd	New River Az 85027
352	202 07 006C	2.2		Peet Steven G;Patricia B					*No Site Address*	Az
874	202 25 003L	5.2		Pence Michael J;Tauni R;Sandra E Farrand					49202 N 7Th Ave	Phoenix Az 85027
665	202 21 037D	1.1		Pendergrass James Allen					43417 N 3Rd Ave	New River Az 85027
756	202 21 093	4.5		Perchal Alene A					13 E Venado Dr	Phoenix Az 85027
896	202 25 009D	1.4		Perrins Thomas W;Margaret L					49028 N 13Th Ave	Phoenix Az 85027
768	202 21 105A	3.8		Peters William M;Rosaline L					102 E Mano Dr	Phoenix Az 85027
860	202 25 001F	2.6		Pfaff Garry L;Connie L					49739 N 11Th Ave	Phoenix Az 85027
440	202 09 011E	3.5		Phelan Stewart L Jr;Linda L					*No Site Address*	Az
441	202 09 011F	3.1		Phelan Stewart L Jr;Linda L					*No Site Address*	Az
800	202 21 129	4.8		Philip Heather Lea					44824 N New River Rd	Phoenix Az 85027
283	204 24 001	81.6	North	Phoenix L P			3232 Cobb Pkwy #315	Atlanta Ga 30339	*No Site Address*	Phoenix Az
672	202 21 039E	1.3		Pinckard Sam Lowell					235 W Southern Ave #169	Mesa Az 85210
305	204 23 006C	20.9	George	Pingitore			36622 N Lazy Ln	Carefree Az 85377	*No Site Address*	Phoenix Az
658	202 21 036F	1.5		Pino Victor;Josephine Ann					43817 N 3Rd Ave	Phoenix Az 85027
540	202 16 012L	2.5		Pirri Anthony J;Margaret L	(623) 465-7840				46636 N New River Rd	New River Az 85087

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541	202 16 012L	0.2		Pirri Anthony J;Margaret L	(623) 465-7840				46636 N New River Rd	New River Az 85087
275	204 13 002A	119.1		PLATEAU VENTURES			201 Sheridan Rd	Kenilworth Il 60043	*No Site Address*	Phoenix Az
653	202 21 034A	4.5		Plenty Ruth A					43436 N 3Rd Ave	Phoenix Az 85027
555	202 16 013H	2.4		Ploense Marvin R;Robin E;Bart D;Tracy L					*No Site Address*	Az
362	202 07 007F	3.1		Pond Thomas A Jr					49643 N 7Th Ave	Phoenix Az 85027
638	202 21 031M	3.3		Porrazzo Salvatore J;Margaret E					116 W Circle Mountain Rd	Phoenix Az 85027
557	202 16 015C	1.0		Potter Mikal W;Janet L					47215 N New River Rd	Phoenix Az 85027
339	204 23 001	3.9		PRESCOTT VALLEY C			PO Box 26494	Prescott Valley Az 86312	28210 N 27Th Ave	Phoenix Az
692	202 21 046C	1.1		Price Earl R Tr					43037 N 7Th Ave	Phoenix Az 85027
246	204 11 002F	19.9	John E & Susan L	Propst			PO Box 41513	Phoenix Az 85080	*No Site Address*	Phoenix Az
121	211 50 030F	1.2	Donald A & Joan	Pryor			7810 N Via De La Sombre	Scottsdale Az 85258	7810 N Via De La Sombre	Scottsdale Az 85258
749	202 21 087C	3.3		Pugh Billie Jean					45404 N 6Th St	New River Az 85027
568	202 21 006K	1.9		Pugh William;Thelma					44426 N 7Th St	New River Az 85027
401	202 08 005R	1.7		Pyle Margaret Ann					135 E Mingus Rd	Phoenix Az 85027
93	211 50 026F	5.0	Ronald W	Raper			22207 N 90Th Ave	Peoria Az 85382	38822 N 11Th Ave	Phoenix Az 85027
443	202 09 011H	3.8		Rapp Douglas E					*No Site Address*	Az
442	202 09 011G	3.4		Rapp Douglas E;Nancy					48209 N Fig Springs Rd	Phoenix Az 85027
106	211 50 020F	4.9	Warren R & Cand	Read			1632 W Irvine Rd	Phoenix Az 85027	1632 W Irvine Rd	Phoenix Az 85027
180	203 33 008F	1.2	Barry	Rechtorovich			402 E Coral Gables Dr	Phoenix Az 85022	*No Site Address*	Az
889	202 25 005Y	4.9		Redshaw Opal R					49002 N 15Th Ave	New River Az 85027
72	211 50 034H	3.2	Michael H & Kay	Reed			7245 E Jenan Dr	Scottsdale Az 85260	39019 N 11Th Ave	Phoenix Az 85027
506	202 16 004D	2.1	Mary Beth	Reed					*No Site Address*	Az
509	202 16 004G	3.6	Mary Beth	Reed					47222 N 7Th Ave	Phoenix Az 85027
907	202 25 016B	4.8		Reese Cynthia A					49435 N 15Th Ave	Phoenix Az 85027
798	202 21 127	5.0		Reidl Raymond L;Joyce L					44635 N Perdiz Dr	Phoenix Az 85027
147	203 33 001Q	2.6	Dale J & Cheryl	Reinhold			4404 W Chama Dr	Glendale Az 85310	4404 W Chama Dr	Glendale Az 85310
770	202 21 106A	2.5		Relation Donald D;Sharon L					*No Site Address*	Az
771	202 21 106C	1.3		Relation Donald D;Sharon L					*No Site Address*	Az
772	202 21 106D	1.0		Relation Donald D;Sharon L					204 E Mano Dr	Phoenix Az 85027
422	202 09 006N	4.3		Republic;Gazette Employees Credit Unio					*No Site Address*	Az
601	202 21 017B	3.8		Rezek Dennis D					*No Site Address*	Az
786	202 21 119B	0.9		Rezek Dennis D					44433 N New River Rd	Phoenix Az 85027
789	202 21 120A	0.7		Rezek Dennis D					44433 N New River Rd	Phoenix Az 85027
792	202 21 121B	0.4		Rezek Dennis D					44405 N New River Rd	Phoenix Az 85027
146	203 32 014C	2.6	Bobby G & Cathy	Rhudy			38245 N 23Rd Ave	Phoenix Az 85027	38245 N 23Rd Ave	Phoenix Az 85027
253	204 11 001F	10.2	Salvatore & Rita	Riccardi			141 Malone Ave	Staten Island Ny 10306	*No Site Address*	Phoenix Az
256	204 11 001E	29.9	Salvatore & Rita	Riccardi			141 Malone Ave	Staten Island Ny 10306	*No Site Address*	Phoenix Az
27	211 73 012	5.2	Ruth G	Rice			2877 Polk Ave	San Diego Ca 92104	*No Site Address*	Az
525	202 16 008A	2.5		Richardson Gordon D;Patsy K					*No Site Address*	Az
522	202 16 007B	2.1		Richardson Gordon Dale;Patsy Kay					*No Site Address*	Az
526	202 16 008C	2.2		Richardson Gordon Dale;Patsy Kay					*No Site Address*	Az
902	202 25 012	4.6		Riegel Sr Charles H;Laura M					1620 W Lazy K Ranch Rd	Phoenix Az 85027
914	202 25 021A	3.9		Risner Roger A;Linda L Pozdoll					*No Site Address*	Az
738	202 21 076	5.5		Robbeloth Michael;Margaret J Tr					8 E Venado Dr	Phoenix Az 85027
466	202 09 020E	2.3		Roberts Joseph L;Laura M					47827 N Fig Springs Rd	Phoenix Az 85027
366	202 07 007K	7.3		Roberts Latetia					4942 N 7Th Ave	Phoenix Az 85013
580	202 21 011B	9.6		Robertson Sloan L					*No Site Address*	Az
690	202 21 044	9.4		Robertson Sloan L					43221 N 3Rd Ave	Phoenix Az 85027
691	202 21 045	9.8		Robertson Sloan L					*No Site Address*	Az
825	202 21 149	4.6		Robinson Dennis J;Karen J					45016 N New River Rd	Phoenix Az 85027
340	202 07 004A	5.7		Rogers Climith W;Grace W Tr					*No Site Address*	Az
846	202 21 168	4.7	Clayton W & Claudia S	Roler	(623) 465-0505		43024 N 7th Ave	New River AZ 85087	43024 N 7Th Ave	New River Az 85087
633	202 21 030F	1.3		Romega Thompson Vasile;Annie					*No Site Address*	Az

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100	203 31 004C	1.5	Judith A & Guad	Romero			PO Box 2142	Carefree Az 85377	*No Site Address*	Az
37	211 50 013	8.5	Gerda A & David	Ross			6064 E Snowdon St	Mesa Az 85215	*No Site Address*	Az
456	202 09 018D	0.6		Ross Jean L					1260 W New River Rd	Phoenix Az 85027
486	202 09 028	1.0		Ross Jean L					1260 W New River Rd	Phoenix Az 85027
70	211 50 028B	4.9	Joseph & Adua M	Rotella			5465 N Nottingham Ave	Chicago Il 60656	*No Site Address*	Az
79	211 50 026E	2.5	Joseph & Auda M	Rotella			5465 N Nottingham Ave	Chicago Il 60656	*No Site Address*	Az
263	204 13 003A	40.3		ROTH INVESTMENT P			3232 Cobb Pkwy #315	Atlanta Ga 30339	*No Site Address*	Phoenix Az
271	204 13 003A	39.9		ROTH INVESTMENT P			3232 Cobb Pkwy #315	Atlanta Ga 30339	*No Site Address*	Phoenix Az
276	204 13 002B	40.2		ROTH INVESTMENT P			3232 Cobb Pkwy #315	Atlanta Ga 30339	*No Site Address*	Phoenix Az
589	202 21 013W	4.9		Rummel Charles O Jr					*No Site Address*	Az
671	202 21 039D	1.1		Russell Wade William					*No Site Address*	Az
520	202 16 006K	2.4		Russell William C;Tamaria L					46812 N 11Th Ave	Phoenix Az 85027
142	211 50 003A	2.6	Michael Frankli	Ryan			905 Martinez St	San Diego Ca 92106	*No Site Address*	Az
153	211 50 003L	2.5	Michael Frankli	Ryan			905 Martinez St	San Diego Ca 92106	*No Site Address*	Az
162	211 50 003C	2.5	Amy Anne	Ryan			340 San Gorgonio St	San Diego Ca 92106	*No Site Address*	Az
168	211 50 003N	2.4	Amy Anne	Ryan			340 San Gorgonio St	San Diego Ca 92106	*No Site Address*	Az
409	202 08 007L	2.5		Ryan Glenda					48277 N 5Th Ave	Phoenix Az 85027
410	202 08 007M	2.5		Ryan Glenda					48227 N 5Th Ave	Phoenix Az 85027
398	202 08 005M	5.1		Rypkema Steven G;Debra S					48626 N 3Rd St	Phoenix Az 85027
399	202 08 005N	4.8		Rypkema Steven G;Debra S					*No Site Address*	Az
834	202 21 159	1.0		Sabrosa Water Co					*No Site Address*	Az
835	202 21 160	0.9		Sabrosa Water Co					*No Site Address*	Az
719	202 21 061C	0.6		Sack William E;Stephanie L					45023 N 7Th St	Phoenix Az 85027
849	202 21 171	1.1		Sack William E;Stephanie L					45023 N 7Th St	Phoenix Az 85027
342	202 07 004E	4.9		Sahr Tommie A;Deette					49015 N 3Rd Ave	Phoenix Az 85027
267	204 13 001F	9.4	Jose M I & Alice	Sanchez			6628 N 16Th Dr	Phoenix Az 85015	*No Site Address*	Phoenix Az
680	202 21 042J	2.3		Sartain J Perry Jr;Wanda A					*No Site Address*	Az
636	202 21 031J	4.6		Sartain James P;Wanda A					*No Site Address*	Az
639	202 21 031Q	2.7		Sartain James P;Wanda A	(623) 465-7749		43020 N 3Rd Ave	New River Az 85087	43020 N 3Rd Ave	New River Az 85087
513	202 16 005G	5.9		Sasfai John W;Dale E					46855 N New River Rd	Phoenix Az 85027
918	202 25 021E	1.9		Saunders Jr Hollis B;Rebecca A					49450 N 15Th Ave	New River Az 85027
425	202 09 007E	1.4		Scharboneau Stephen G;Robson Cheryl					48908 N 7Th Ave	New River Az 85027
608	202 21 020C	2.2		Scharer Stuart;Jane					1100 W Circle Mountain Rd	Phoenix Az 85027
603	202 21 018D	4.7		Schartz Chales A					*No Site Address*	Az
783	202 21 116	4.9		Schillinger Development Inc					227 E Mano Dr	Phoenix Az 85027
3	211 22 002L	5.3	Gary M & N R	Schmertmann			6117 W West Wind Dr	Glendale Az 85310	*No Site Address*	Az
654	202 21 034B	4.1		Schmitt Marguerite A					43416 N 3Rd Ave	New River Az 85027
730	202 21 068	4.9		Schmueckle Siegreied;Sturm Jennifer L					45237 N 6Th St	Phoenix Az 85027
765	202 21 102	3.9		Schumacher Dennis L;Hannah E					123 W Sabrosa Dr	Phoenix Az 85027
626	202 21 028B	2.2		Schwarze Robert C;Tracey O					*No Site Address*	Az
627	202 21 028C	2.3		Schwarze Robert C;Tracey O					*No Site Address*	Az
237	211 25 001	320.1		SECURITY TITLE AG			3620 N 3Rd Ave	Phoenix Az 85013	*No Site Address*	Phoenix Az
238	204 12 002	160.9		SECURITY TITLE AG			3620 N 3Rd Ave	Phoenix Az 85013	*No Site Address*	Phoenix Az
249	204 12 001	160.2		SECURITY TITLE AG			3620 N 3Rd Ave	Phoenix Az 85013	*No Site Address*	Phoenix Az
250	204 12 003	162.0		SECURITY TITLE AG			3620 N 3Rd Ave	Phoenix Az 85013	*No Site Address*	Phoenix Az
510	202 16 004H	1.5	James M;Linda	Sellett					46827 N 6Th Ave	Phoenix Az 85027
634	202 21 031C	8.7		Selleys Charles T Tr					43826 N 3Rd Ave	Phoenix Az 85027
911	202 25 018	2.4		Seroka Paul J;Evaughn M					1215 W Lazy K Ranch Rd	Phoenix Az 85027
353	202 07 006D	2.3		Sharp Jessie E Jr;Joanna					*No Site Address*	Az
881	202 25 005C	5.1		Shell Daniel Stearns;Lezlie A					49234 N 17Th Ave	Phoenix Az 85027
507	202 16 004E	1.6	Eddie H	Shelton					*No Site Address*	Az
508	202 16 004F	1.3	Eddie H	Shelton					47222 N 7Th Ave	New River Az 85027
420	202 09 006L	1.0		Shepston Nettie B					48818 N 7Th Ave	New River Az 85027

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542	202 16 012M	2.0		Sherick William Robert Jr					46625 N New River Rd	Phoenix Az 85027
188	203 33 003B	4.9	Mark L & Caroly	Shockey			3742 W Yorkshire Dr	Glendale Az 85308	*No Site Address*	Az
781	202 21 114	4.7		Simpson Alfred F;Dorothy I					415 E Mano Dr	Phoenix Az 85027
807	202 21 134	5.3		Simpson Roger Thomas;Donnia					44806 N Zorrillo Dr	Phoenix Az 85027
787	202 21 119C	0.6		Singer Tina					44433 N New River Rd	Phoenix Az 85027
788	202 21 119D	4.5		Singer Tina					44433 N New River Rd	Phoenix Az 85027
460	202 09 018W	3.7		Single Ruth					1252 W New River Rd	Phoenix Az 85027
461	202 09 018X	0.6		Single Ruth					*No Site Address*	Az
517	202 16 006G	2.6		Sisson Errol R;Martha R					46831 N 13Th Ave	Phoenix Az 85027
193	203 32 009C	1.5	Arthur T & Jane	Skaggs			8510 W Avenida Del Sol	Peoria Az 85382	37832 N 19Th Ave	Phoenix Az 85027
157	211 50 048E	1.4	Delbert K & Kri	Skinner			38207 N 16Th St	Phoenix Az 85027	38214 N 15Th Ave	Phoenix Az 85027
158	211 50 048F	1.3	Delbert K & Kri	Skinner			38207 N 16Th St	Phoenix Az 85027	38216 N 15Th Ave	Phoenix Az 85027
160	211 50 048J	1.3	Delbert K & Kri	Skinner II			2156 W Wickieup Ln	Phoenix Az 85027	38207 N 16Th Ave	Phoenix Az 85027
187	203 32 004	10.1	L L C	Slac			38624 N 7Th Ave	Phoenix Az 85027	*No Site Address*	Az
383	202 08 003C	4.6		Slane Michael;Heidi					*No Site Address*	Az
718	202 21 061B	1.0		Smith Albert;Mary L					45025 N 6Th St	Phoenix Az 85027
637	202 21 031L	0.8		Smith Cheryl Leah Smith;Sartain Wanda					407 W Circle Mountain Rd	New River Az 85027
454	202 09 017B	2.3		Smith David Mitchell;Layne Alice					48420 N Fig Springs Rd	Phoenix Az 85027
737	202 21 075	4.9		Smith Stephen W;Robbie A					45637 N New River Rd	Phoenix Az 85027
499	202 16 001A	4.1		Smith Vincent O;Patty A					47027 N New River Rd	New River Az 85027
500	202 16 002	5.1		Smith Vincent O;Patty A					47007 N New River Rd	Phoenix Az 85027
888	202 25 005X	4.9		Sokol John J;Jeannette A					49036 N 15Th Ave	Phoenix Az 85027
883	202 25 005G	2.6		Sokol Larry S;Sally E					49211 N 16Th Ave	Phoenix Az 85027
884	202 25 005H	2.4		Sokol Larry S;Sally E					*No Site Address*	Az
528	202 16 008G	2.6		Sokol Patricia A					47013 N 13Th Ave	Phoenix Az 85027
120	211 50 030E	1.1	Tamara L	Solem			PO Box 5055	Carefree Az 85377	*No Site Address*	Az
90	203 31 006A	4.9	Karen W	Spencer			7119 E Bellingham Dr	Tucson Az 85730	38800 N 21St Ave	Phoenix Az 85027
445	202 09 013E	2.9		Stanley Harold J					819 W Wolftrap Rd	New River Az 85027
446	202 09 013F	3.3		Stanley Harold J;Linda K					*No Site Address*	Az
451	202 09 013N	1.9		Stanley Harold J;Linda K					*No Site Address*	Az
452	202 09 013P	1.9		Stanley Harold J;Linda K					47613 N 9Th Ave	Phoenix Az 85027
487	202 09 029C	1.0		Stanley Linda K					1301 W Roughrider Rd	New River Az 85027
498	202 15 001	639.3		State of Arizona					*No Site Address*	
930		802.8		State Of Arizona						
931		5918.1		State Of Arizona						
581	202 21 013D	8.9		Stein G S;A F;Reich S;Pelman Ltd Partner					*No Site Address*	Az
583	202 21 013L	9.0		Stein G S;A F;Reich S;Pelman Ltd Partner					*No Site Address*	Az
494	202 09 033	1.7		Stevens Cindy R					1121 W Wolftrap Rd	New River Az 85027
462	202 09 018Y	1.5		Stevens Kevin W;Teresa M					1239 W New River Rd	New River Az 85027
373	202 07 009E	4.8		Stitzer Iv Arthur B					49428 N Central Ave	Phoenix Az 85027
611	202 21 021	9.5		Strebler James R;Brenda J					*No Site Address*	Az
624	202 21 027B	4.9		Strebler James R;Brenda J					*No Site Address*	Az
745	202 21 083	4.4		Strippelman John C;Sharon L					416 E Venado Dr	New River Az 85027
838	202 21 163	4.8		Strouse Grace M					43205 N 13Th Ave	Phoenix Az 85027
833	202 21 157	5.5		Sullivan John J;Miava					45603 N Zorrillo Dr	Phoenix Az 85027
546	202 16 012T	1.4		Sutton Sandra L;Davidson Susan J					46611 N 11Th Ave	Phoenix Az 85027
547	202 16 012U	0.3		Sutton Sandra L;Davidson Susan J					*No Site Address*	Az
802	202 21 130	3.9		Svoboda Frank;Dorothy N Tr					44844 N Shangri La Ln	Phoenix Az 85027
289	204 23 012	41.8	Olie E	Swanky			5216 N 45Th Pl	Phoenix Az 85018	*No Site Address*	Phoenix Az
368	202 07 008C	5.3		Swanson William;Agnes					49625 N 5Th Ave	New River Az 85027
604	202 21 018E	4.6		Swartz Charles A					*No Site Address*	Az
531	202 16 010P	2.0		Sweeney Robert J;Mary J					*No Site Address*	Az
668	202 21 038B	4.7		Tallman Frank S;Bonnie J					*No Site Address*	Az

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600	202 21 016L	1.3		Tarver William D;Tracy L					43426 N 7Th Ave	Phoenix Az 85027
384	202 08 003E	2.0		Taylor Robert J Iii;Kerrie L					48803 N 7Th Ave	New River Az 85027
438	202 09 010W	19.6		Teen Challenge Of Arizona Inc					*No Site Address*	Az
693	202 21 046D	1.1		Terry Cynthia A					43027 N 7Th Ave	Phoenix Az 85027
569	202 21 006L	2.9		Terry Fred Wayne;Diana L					44424 N 7Th St	Phoenix Az 85027
68	211 50 021B	6.7	James B	Theiss			3144 W Pierce St	Phoenix Az 85009	39009 N 19Th Ave	Phoenix Az 85027
45	203 31 001J	1.7	Paul E & Julian	Thiessen			2140 E Michigan Ave #22	Phoenix Az 85022	1731 W Behrend Dr	Phoenix Az 85027
261	204 13 001Q	5.7	Thomas R & Doris	Thomas R & Doris			5866 N Echo Canyon Ln	Phoenix Az 85018	*No Site Address*	Phoenix Az
136	211 50 032B	2.6	Michael W	Thompson			38405 N 16Th Ave	Phoenix Az 85027	38405 N 16Th Ave	Phoenix Az 85027
858	202 25 001B	4.2		Thompson Doyle Dean;Bobby Ann					49638 N 7Th Ave	New River Az 85027
868	202 25 002	2.5		Thompson Doyle;Bobby Ann					49648 N 7Th Ave	Phoenix Az 85027
662	202 21 036M	1.4		Thompson Gale P					43841 N 3Rd Ave	Phoenix Az 85027
587	202 21 013U	2.4		Thompson John R;Evelyn H					*No Site Address*	Az
777	202 21 110	4.6		Thompson Timothy N;Barbara L					44833 N 6Th St	Phoenix Az 85027
191	203 32 011	10.1	Dallas D	Thorn			945 N Pasadena #51	Mesa Az 85201	*No Site Address*	Az
109	211 50 019A	5.4	L P	Tmn					*No Site Address*	Az
8	211 22 002F	2.5	Donna M & Ryan	Toon			PO Box 100	Salome Az 85348	*No Site Address*	Az
214	203 25 001B	166.5		TRAMONTO DEVELO			5343 N 16Th St #460	Phoenix Az 85016	*No Site Address*	Phoenix Az
215	203 26 001	320.9		TRAMONTO DEVELO			5343 N 16Th St #460	Phoenix Az 85016	*No Site Address*	Phoenix Az
216	203 26 002	292.4		TRAMONTO DEVELO			5343 N 16Th St #460	Phoenix Az 85016	3310 W Carefree Hwy	Phoenix Az
73	203 31 001F	4.8	James L & Cynth	Trikoff			39013 N 21St Ave	Phoenix Az 85027	39021 N 21St Ave	Phoenix Az 85027
646	202 21 031Z	4.1		Trombi Robert P;Joette C					47 W Circle Mountain Rd	Phoenix Az 85027
94	203 31 009C	2.5	James A & Cynth	Tullis			38815 N 23Rd Ave	Phoenix Az 85027	38815 N 23Rd Ave	Phoenix Az 85027
63	203 31 010A	5.1	Dwight D & Jane	Turmo			4337 W Acoma Dr	Glendale Az 85306	39111 N 24Th St	Phoenix Az 85027
76	203 31 010B	5.0	Dwight D & Jane	Turmo			4337 W Acoma Dr	Glendale Az 85306	*No Site Address*	Az
124	211 50 032A	7.7	Daniel W	Twitchell Jr.			1535 W Irvine Rd	Phoenix Az 85027	1535 W Irvine Rd	Phoenix Az 85027
302	204 23 005G	1.5		U S BUREAU OF REC			135 N 2Nd Ave	Phoenix Az 85003	*No Site Address*	Phoenix Az
306	204 23 005D	8.0		U S BUREAU OF REC			135 N 2Nd Ave	Phoenix Az 85003	*No Site Address*	Phoenix Az
307	204 23 005F	4.0		U S BUREAU OF REC			135 N 2Nd Ave	Phoenix Az 85003	*No Site Address*	Phoenix Az
315	204 24 005P	16.7		U S BUREAU OF REC			2410 W Keim Dr	Phoenix Az 85015	*No Site Address*	Phoenix Az
316	204 24 005N	3.0		U S BUREAU OF REC			201 N Central Ave #2200	Phoenix Az 85073	*No Site Address*	Phoenix Az
457	202 09 018K	1.0		Underwood Larn L;Jenny S					1232 W New River Rd	Phoenix Az 85027
458	202 09 018P	0.1		Underwood Larn L;Jenny S					1256 W New River Rd	Phoenix Az 85027
459	202 09 018P	0.7		Underwood Larn L;Jenny S					1256 W New River Rd	Phoenix Az 85027
450	202 09 013L	1.0		Underwood Lee C;Verbena L					*No Site Address*	Az
295	204 23 010	40.2		UNITED STATES OF			201 N Central Ave #2200	Phoenix Az 85073	*No Site Address*	Phoenix Az
299	204 24 006F	10.4		UNITED STATES OF			3707 N 7Th St	Phoenix Az 85014	*No Site Address*	Phoenix Az
301	204 24 006D	13.7		UNITED STATES OF			135 N 2Nd Ave	Phoenix Az 85003	*No Site Address*	Phoenix Az
304	204 24 006B	9.6		UNITED STATES OF			8336 E Cypress St	Scottsdale Az 85257	*No Site Address*	Phoenix Az
317	204 24 005M	38.3		UNITED STATES OF			201 N Central Ave #2200	Phoenix Az 85073	*No Site Address*	Phoenix Az
320	204 23 009N	7.9		UNITED STATES OF			201 N Central Ave #2200	Phoenix Az 85073	*No Site Address*	Phoenix Az
337	204 24 003G	4.4		UNITED STATES OF			PO Box 9980	Phoenix Az 85068	*No Site Address*	Phoenix Az
882	202 25 005E	5.5		Ursutz Joseph E					49021 N 17Th Ave	Phoenix Az 85027
891	202 25 007A	3.8		Ursutz Joseph E					49021 N 17Th Ave	Phoenix Az 85027
521	202 16 007A	2.2		Valenzuela Manuel R;Gracie					*No Site Address*	Az
240	204 11 001L	2.9	Albert & Janice	Vaninetti			9058 N 40Th Dr	Phoenix Az 85051	*No Site Address*	Phoenix Az
99	203 31 004D	1.4	Mary L	Vasquez			9122 N Cave Creek Rd	Phoenix Az 85020	38808 N 21St Ave	Phoenix Az 85027
649	202 21 032E	0.3		Vaughan Hazel A;Matthew P;Elizabeth B					*No Site Address*	Az
650	202 21 032F	1.6		Vaughan Hazel A;Matthew P;Elizabeth B					43612 N 3Rd Ave	New River Az 85027
721	202 21 061F	1.0		Vega Anthony R Jr;Suzette R					*No Site Address*	Az
392	202 08 004J	10.3		Wahlstrom John C Tr					*No Site Address*	Az
612	202 21 022A	4.2		Walker Berten F;Barbara E					42645 N 11Th Ave	Phoenix Az 85027
426	202 09 007F	1.3		Walsh Sheila					2834 W Maryland Ave	Phoenix Az 85017

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485	202 09 027B	1.7		Walsh William F;Maria M					*No Site Address*	Az
387	202 08 003H	5.6		Wardell Fred R;Billie P					48851 N Fig Springs Rd	New River Az 85027
625	202 21 028A	4.7		Watkins L Allyn Tr					42635 N 11Th Ave	Phoenix Az 85027
386	202 08 003G	4.7		Watson Warren W Ii;Barbara E					*No Site Address*	Az
31	211 50 034B	9.2	Stanton V & Kay	Weckerly			28681 Walnut Grv	Mission Viejo Ca 92692	*No Site Address*	Az
605	202 21 019A	4.8		Weiss Donald G;Sue L					43807 N 11Th Ave	Phoenix Az 85027
606	202 21 019B	5.1		Weiss Donald G;Sue L					43950 N 11Th Ave	Phoenix Az 85027
530	202 16 010N	2.2		Werner George Paul;Joyce Ann					*No Site Address*	Az
318	204 24 005T	48.9		WESTTREND DYNAMIT			PO Box 9686	Scottsdale Az 85252	*No Site Address*	Phoenix Az
489	202 09 029F	1.0		Whelpley Henry A;Anna Jolene					1408 W Roughrider Rd	Phoenix Az 85027
762	202 21 099	4.4		Whitacre Leighanne M					102 W Sabrosa Dr	Phoenix Az 85027
363	202 07 007G	2.5		White Robert P					49615 N 4Th Ave	New River Az 85027
377	202 07 011	2.9		Whitelaw James W;Jodi L					*No Site Address*	Az
538	202 16 010Z	1.4		Wikarski Lawrence L;Andrea Sinohui					47300 N New River Rd	Phoenix Az 85027
535	202 16 010W	0.0		Wikarski Lawrencel;Sinohui Andrea A					*No Site Address*	Az
556	202 16 014	1.0		Wikarski Lawrencel;Sinohui Andrea A					*No Site Address*	Az
402	202 08 006	39.3		Williams Edgar D Tr					*No Site Address*	Az
403	202 08 007B	10.4		Williams Edgar D Tr					*No Site Address*	Az
428	202 09 008	39.6		Williams Edgar D Tr					*No Site Address*	Az
713	202 21 055	1.4		Williams Jody Ann					602 W Circle Mountain Rd	Phoenix Az 85027
408	202 08 007K	5.0		Williams Roger A;Patricia A					48439 N 7Th Ave	Phoenix Az 85027
890	202 25 006	4.9		Wilsey Mary Sue Tr					49211 N 13Th Ave	Phoenix Az 85027
432	202 09 010B	3.3		Wilson Wayne R					48216 N Fig Springs Rd	New River Az 85027
165	203 32 014F	2.5	Jonathan	Wohl			PO Box 1269	Phoenix Az 85001	*No Site Address*	Az
679	202 21 042G	2.2		Wolcott Stephen P;Tammie;Vv					43046 N 3Rd Ave	New River Az 85027
618	202 21 025D	1.2		Wolfe John H;Leslie L					42811 N 11Th Ave	Phoenix Az 85027
343	202 07 004F	4.7		Wright Jeffrey;Mary					210 W Mingus Rd	Phoenix Az 85027
822	202 21 147A	2.7		Wright Michael					45248 N New River Rd	Phoenix Az 85027
361	202 07 007E	5.4		Wright Robert T;Margaret G					49610 N 4Th Ave	New River Az 85027
892	202 25 007B	2.5		Yeager James R;Nancy M					49212 N 17Th Ave	Phoenix Az 85027
893	202 25 008	2.4		Yeager James R;Nancy M					*No Site Address*	Az
754	202 21 091	4.5		Young Bonnie A					203 E Venado Dr	Phoenix Az 85027
464	202 09 019C	3.1		Young Charles A					*No Site Address*	Az
47	203 31 001B	8.2	Hans H & Carol	Zimmerman			828 W Indianola Ave	Phoenix Az 85013	*No Site Address*	Phoenix Az
141	211 50 041	9.4	Hans H & Carol	Zimmerman			828 W Indianola Ave	Phoenix Az 85013	*No Site Address*	Az
613	202 21 022B	4.1		Z-Snap Inc					42614 N 11Th Ave	Phoenix Az 85027
710	202 21 053	2.6		Zurcher Robert S					*No Site Address*	Az
711	202 21 053	1.5		Zurcher Robert S					*No Site Address*	Az
4	211 22 002K	25.2								
14	211 73 003Z	1.5	MK INT INC				PO Box 41161	Phoenix Az 85080	*No Site Address*	Az
15	211 73 043	1.5	MK INT INC				PO Box 41161	Phoenix Az 85080	*No Site Address*	Az
34	211 50 009A	4.5	REEVES UNDERGRO				4738 W Wahalla Ln	Glendale Az 85308	1211 W Desert Hills Dr	Phoenix Az
74	N/A	0.4								
89	203 31 004A	7.3								
103	211 50 015B	7.1	DESERT HILLS IN				PO Box 4071	Springfield Mo 65808	*No Site Address*	Az
108	211 50 019B	5.0	TMN LIMITED PAR				5830 W Del Lago Cir	Glendale Az 85308	1538 W Erwin Rd	Az
123	211 50 008	9.6								
126	211 50 014H	2.5								
133	203 32 018	9.0								
174	203 32 002	10.1	N ARIZ FOUNDATI				206 S Hinton	Scottsdale Az 85251	*No Site Address*	Az
189	203 33 003A	5.0								
198	203 38 001N	4.5	ITOW FAMILY LIM				2145 W Williams Dr	Phoenix Az 85027	36827 N 27Th Ave	Phoenix Az 85027
225		0.4								

APPENDIX B, TABLE B-2
SKUNK CREEK WATERCOURSE MASTER PLAN, PHASES 1 and 2
List of Property Ownership Information Sorted by Last Name

TAG No. (1)	Assessors's Parcel Number (2)	Assessors's Parcel Area (3)	Name of Owner First (4)	Name of Owner Last (5)	Phone Number (6)	e-mail Address	Mailing Address 1 (7)	Mailing Address 2 (8)	Site Address 1 (9)	Site Adress 2 (10)
245		0.4								
248	204 11 001P	15.0	Tiffany				6535 N Arizona Biltmore	Phoenix Az 85016	*No Site Address*	Phoenix Az
260	204 13 001N	10.9	THOMAS W & JOYCE						*No Site Address*	Phoenix Az
262	204 13 001S	2.6	THOMAS W & JOYCE						*No Site Address*	Phoenix Az
281		1.1								
284		1.7								
285	204 24 002C	15.5					PO Box 31699	Phoenix Az 85046	*No Site Address*	Phoenix Az
327		1.2								
379	202 07 N/A	2.1								
424	202 09 007D	8.1								
427	202 09 007G	5.2								
495	202 09 N/A	0.3								
496	202 09 N/A	0.7								
497	202 09 N/A	0.3								
527	202 16 008F	2.6								
560	202 16 016C	3.9								
561	202 16 N/A	1.7								
562	202 16 N/A	0.2								
563	202 16 N/A	0.7								
564	202 16 N/A	0.3								
565	202 16 N/A	0.2								
597	202 21 016H	1.7								
774	202 21 107C	3.7								
855	202 21 N/A	0.5								
856	202 21 N/A	0.2								
857	202 21 N/A	0.2								
863	202 25 001M	5.4								
928	202 25 N/A	0.3								

Appendix C

List of Areas of Floodplain, Floodway and Erosion Hazard Zones for each Property

APPENDIX C, TABLE C-1
SKUNK CREEK WATERCOURSE MASTER PLAN, PHASE 2
List of Floodplain, Floodway, and Erosion Hazard Zones Areas Sorted by TAG

LEGEND:
- 100% of parcel is within the FEMA 100-yr Floodway and the Erosion Control Zone
- 100% of parcel is within the FEMA 100-yr Floodway
- 100% of parcel is within the Erosion Control Zone

			Area in acres (columns 4-5, 7, 9-10, 12-14)										
				FEMA 100-yr Floodplain		FEMA 100-yr Floodway			Erosion Hazard Zones				
									Erosion Control Zone				
Tag No. (1)	Assessors's Parcel Number (2)	Last Name (3)	Total Parcel (4)	Area (5)	% of Parcel (5)/(4) (6)	Area (7)	% of Parcel (7)/(4) (8)	FEMA 100-yr Floodway Fringe (5)-(7) (9)	Area (12)+(13) (10)	% of Parcel (10)/(4) (11)	Severe (12)	Lateral Migration (13)	Long-Term (14)
1	211 22 003A	Anthem by Del Webb. Maryanne Kumiega	478.9	45.6	9.5%	31.4	6.6%	14.2	43.0	9.0%	38.4	4.6	4.6
2	211 22 003B	Anthem by Del Webb. Maryanne Kumiega	121.2	8.6	7.1%	1.8	1.5%	6.8	6.3	5.2%	5.1	1.2	4.2
3	211 22 002L	Schmertmann	5.3	0.0	0.0%	0.0	0.0%	0.0	0.0	0.0%	0.0	0.0	0.1
4	211 22 002K		25.2	6.0	23.8%	4.1	16.3%	1.9	5.0	19.8%	3.0	2.0	2.5
5	211 22 002B	McKeag	2.5	2.5	100.0%	2.5	100.0%	0.0	2.5	100.0%	2.5	0.0	0.0
6	211 22 002J	Geraci	3.0	3.0	100.0%	3.0	100.0%	0.0	3.0	100.0%	2.3	0.7	0.0
7	211 22 002H	Geraci	2.0	2.0	100.0%	2.0	100.0%	0.0	2.0	100.0%	2.0	0.0	0.0
8	211 22 002F	Toon	2.5	2.5	100.0%	2.5	100.0%	0.0	2.5	100.0%	2.5	0.0	0.0
9	211 86 001	Anthem by Del Webb. Maryanne Kumiega	636.6	147.0	23.1%	106.6	16.7%	40.4	126.0	19.8%	62.1	63.9	64.5
10	211 73 003S	Crews	16.5	10.1	61.2%	8.1	49.1%	2.0	10.3	62.4%	9.6	0.7	1.7
11	211 73 003X	Johnson	4.9	2.0	40.8%	2.0	40.8%	0.0	2.6	53.1%	2.5	0.1	0.6
14	211 73 003Z		1.5	0.7	46.7%	0.7	46.7%	0.0	0.8	53.3%	0.7	0.1	0.2
15	211 73 043		1.5	0.7	46.7%	0.6	40.0%	0.1	0.7	46.7%	0.7	0.0	0.3
22	211 73 015C	Crews	2.0	0.2	10.0%	0.0	0.0%	0.2	0.5	25.0%	0.2	0.3	0.3
33	211 50 009F	Davis	1.2	0.0	0.0%	0.0	0.0%	0.0	0.0	0.0%	0.0	0.0	0.3
34	211 50 009A		4.5	1.6	35.6%	0.0	0.0%	1.6	0.0	0.0%	0.0	0.0	3.1
35	211 50 007A	McCartney	2.2	2.2	100.0%	0.0	0.0%	2.2	0.3	13.6%	0.0	0.3	1.9
36	211 50 007C	Nicholson	4.2	4.2	100.0%	2.5	59.5%	1.7	3.3	78.6%	0.0	3.3	0.9
39	211 50 011A	Cherry Jr.	4.5	0.0	0.0%	0.0	0.0%	0.0	0.0	0.0%	0.0	0.0	0.3
40	211 50 011D	Cantelme	3.1	1.0	32.3%	0.2	6.5%	0.8	0.5	16.1%	0.0	0.5	1.0
41	211 50 015A	Gellerman	9.0	9.0	100.0%	8.5	94.4%	0.5	9.0	100.0%	4.7	4.3	0.0
50	211 50 007B	Jorgensen	2.2	1.9	86.4%	0.0	0.0%	1.9	0.0	0.0%	0.0	0.0	2.1
51	211 50 011C	Cantelme II	1.8	1.4	77.8%	0.7	38.9%	0.7	0.9	50.0%	0.0	0.9	0.8
60	211 50 028C	Jones	9.8	4.1	41.8%	0.2	2.0%	3.9	0.6	6.1%	0.0	0.6	4.4
61	211 50 016B	Hsu	10.0	8.6	86.0%	5.6	56.0%	3.0	8.0	80.0%	5.9	2.1	1.4
62	211 50 022	Hopwood	9.6	9.6	100.0%	8.9	92.7%	0.7	8.4	87.5%	3.0	5.4	1.2
66	203 31 002A	Foley	5.0	0.0	0.0%	0.0	0.0%	0.0	0.1	2.0%	0.0	0.1	0.6
68	211 50 021B	Theiss	6.7	0.9	13.4%	0.0	0.0%	0.9	0.9	13.4%	0.5	0.4	0.9
71	211 50 017A	Mathis	4.8	2.2	45.8%	1.5	31.3%	0.7	2.9	60.4%	2.5	0.4	0.8
77	203 31 002D	Foley	2.2	0.2	9.1%	0.0	0.0%	0.2	0.6	27.3%	0.2	0.4	0.7
81	211 50 025	Barto II	9.9	0.0	0.0%	0.0	0.0%	0.0	0.0	0.0%	0.0	0.0	0.2
82	211 50 016E	McHenry	4.5	4.4	97.8%	3.6	80.0%	0.8	4.5	100.0%	4.5	0.0	0.0
83	211 50 024	Anthony	9.8	9.8	100.0%	9.8	100.0%	0.0	9.8	100.0%	8.6	1.2	0.0
84	211 50 016J	Harper	6.5	6.5	100.0%	6.5	100.0%	0.0	3.8	58.5%	0.8	3.0	2.7
85	211 50 023	Pearson	10.4	7.0	67.3%	2.9	27.9%	4.1	0.2	1.9%	0.0	0.2	7.8
90	203 31 006A	Spencer	4.9	0.0	0.0%	0.0	0.0%	0.0	0.0	0.0%	0.0	0.0	0.6
91	203 31 013A	Jennings	4.7	3.4	72.3%	1.8	38.3%	1.6	4.1	87.2%	3.6	0.5	0.6
92	211 50 016D	McHenry	4.6	4.6	100.0%	4.6	100.0%	0.0	4.6	100.0%	4.6	0.0	0.0
96	203 31 013B	Barker	4.7	4.5	95.7%	3.9	83.0%	0.6	4.7	100.0%	4.7	0.0	0.0
97	203 31 006B	Parizek	5.0	0.1	2.0%	0.0	0.0%	0.1	0.7	14.0%	0.4	0.3	0.6
98	211 50 016F	Harper	1.1	1.1	100.0%	1.0	90.9%	0.1	0.0	0.0%	0.0	0.0	1.1

APPENDIX C, TABLE C-1
SKUNK CREEK WATERCOURSE MASTER PLAN, PHASE 2
List of Floodplain, Floodway, and Erosion Hazard Zones Areas Sorted by TAG

LEGEND:

- 100% of parcel is within the FEMA 100-yr Floodway and the Erosion Control Zone
- 100% of parcel is within the FEMA 100-yr Floodway
- 100% of parcel is within the Erosion Control Zone

			Area in acres (columns 4-5, 7, 9-10, 12-14)										
				FEMA 100-yr Floodplain		FEMA 100-yr Floodway		FEMA 100-yr Floodway Fringe	Erosion Hazard Zones				
									Erosion Control Zone		Severe	Lateral Migration	Long-Term
Tag No. (1)	Assessors's Parcel Number (2)	Last Name (3)	Total Parcel (4)	Area (5)	% of Parcel (5)/(4) (6)	Area (7)	% of Parcel (7)/(4) (8)	(5)-(7) (9)	Area (12)+(13) (10)	% of Parcel (10)/(4) (11)	(12)	(13)	(14)
103	211 50 015B		7.1	6.5	91.5%	5.6	78.9%	0.9	6.7	94.4%	5.6	1.1	0.4
104	211 50 037C	Mathis	5.2	5.2	100.0%	4.4	84.6%	0.8	4.7	90.4%	0.8	3.9	0.5
106	211 50 020F	Read	4.9	2.5	51.0%	2.1	42.9%	0.4	0.2	4.1%	0.0	0.2	2.7
107	211 50 020C	Masters	5.3	1.9	35.8%	0.8	15.1%	1.1	0.0	0.0%	0.0	0.0	2.4
108	211 50 019B		5.0	0.3	6.0%	0.0	0.0%	0.3	0.0	0.0%	0.0	0.0	0.8
113	203 31 007A	Fuller	5.0	0.0	0.0%	0.0	0.0%	0.0	0.0	0.0%	0.0	0.0	0.7
114	203 31 005A	Lawhorn	5.1	1.5	29.4%	1.2	23.5%	0.3	2.2	43.1%	1.7	0.5	0.6
115	203 31 003	Gavin	9.2	9.2	100.0%	8.1	88.0%	1.1	9.2	100.0%	9.1	0.1	0.0
116	211 50 015C	DESERT HILLS INESTMENT CO LLC	2.2	2.2	100.0%	0.7	31.8%	1.5	2.2	100.0%	2.0	0.2	0.0
117	211 50 037D	Hospelhorn	4.6	0.7	15.2%	0.3	6.5%	0.4	0.5	10.9%	0.0	0.5	1.3
118	203 31 005B	Murray	4.9	3.4	69.4%	3.0	61.2%	0.4	3.7	75.5%	3.3	0.4	0.9
119	211 50 030C	Lambertus	1.3	0.3	23.1%	0.0	0.0%	0.3	0.4	30.8%	0.0	0.4	0.9
120	211 50 030E	Solem	1.1	0.0	0.0%	0.0	0.0%	0.0	0.3	27.3%	0.0	0.3	0.8
121	211 50 030F	Pryor	1.2	0.0	0.0%	0.0	0.0%	0.0	0.1	8.3%	0.0	0.1	1.0
122	211 50 030D	Bowers	1.1	0.0	0.0%	0.0	0.0%	0.0	0.0	0.0%	0.0	0.0	0.4
130	203 32 010B	Kimbrel	4.9	2.2	44.9%	1.0	20.4%	1.2	1.8	36.7%	0.4	1.4	1.9
131	203 32 010A	Collins	4.9	4.5	91.8%	3.2	65.3%	1.3	4.5	91.8%	3.0	1.5	0.4
132	203 32 007	Belveal	9.8	8.0	81.6%	6.7	68.4%	1.3	7.9	80.6%	7.2	0.7	1.9
133	203 32 018		9.0	6.4	71.1%	0.7	7.8%	5.7	1.8	20.0%	1.2	0.6	7.2
137	211 50 030A	Miller	4.3	0.0	0.0%	0.0	0.0%	0.0	0.0	0.0%	0.0	0.0	2.0
138	203 32 008E	Foley	5.0	0.0	0.0%	0.0	0.0%	0.0	0.0	0.0%	0.0	0.0	0.5
141	211 50 041	Zimmerman	9.4	0.0	0.0%	0.0	0.0%	0.0	0.0	0.0%	0.0	0.0	0.4
146	203 32 014C	Rhudy	2.6	0.3	11.5%	0.0	0.0%	0.3	0.2	7.7%	0.0	0.2	0.6
148	203 32 006	Parks	10.2	9.1	89.2%	8.2	80.4%	0.9	10.2	100.0%	9.2	1.0	0.0
149	203 32 001A	Belveal	20.3	1.0	4.9%	0.7	3.4%	0.3	2.7	13.3%	1.0	1.7	16.4
150	203 32 013F	Caylor	2.0	0.0	0.0%	0.0	0.0%	0.0	0.0	0.0%	0.0	0.0	2.0
151	203 32 013E	Caylor	2.6	0.0	0.0%	0.0	0.0%	0.0	0.0	0.0%	0.0	0.0	2.1
156	203 32 014D	Mathis	2.6	0.8	30.8%	0.0	0.0%	0.8	0.6	23.1%	0.1	0.5	0.5
165	203 32 014F	Wohl	2.5	0.9	36.0%	0.0	0.0%	0.9	0.9	36.0%	0.5	0.4	0.5
166	203 32 013D	Dekarske	2.5	0.0	0.0%	0.0	0.0%	0.0	0.0	0.0%	0.0	0.0	2.1
172	203 32 014E	Atchley	2.5	1.1	44.0%	0.4	16.0%	0.7	1.1	44.0%	0.9	0.2	0.5
173	203 33 010	Beck	10.1	0.0	0.0%	0.0	0.0%	0.0	0.0	0.0%	0.0	0.0	0.1
174	203 32 002		10.1	6.6	65.3%	5.3	52.5%	1.3	6.9	68.3%	6.3	0.6	2.2
175	203 32 005C	Melvin	4.9	3.6	73.5%	2.8	57.1%	0.8	4.0	81.6%	3.1	0.9	0.9
176	203 32 012F	Fair	3.3	0.0	0.0%	0.0	0.0%	0.0	0.0	0.0%	0.0	0.0	0.8
178	203 32 005D	Melvin	3.9	2.5	64.1%	2.3	59.0%	0.2	2.9	74.4%	2.2	0.7	1.0
185	203 32 005B	Damer	1.3	0.9	69.2%	0.0	0.0%	0.9	0.1	7.7%	0.0	0.1	1.2
186	203 33 004	Childress	10.1	0.4	4.0%	0.0	0.0%	0.4	0.8	7.9%	0.1	0.7	4.8
187	203 32 004	Slac	10.1	9.6	95.0%	8.6	85.1%	1.0	9.5	94.1%	8.8	0.7	0.6
190	203 32 003B	Damer	5.1	4.2	82.4%	3.4	66.7%	0.8	2.4	47.1%	1.4	1.0	2.4
191	203 32 011	Thorn	10.1	0.0	0.0%	0.0	0.0%	0.0	0.0	0.0%	0.0	0.0	0.4

APPENDIX C, TABLE C-1
SKUNK CREEK WATERCOURSE MASTER PLAN, PHASE 2
List of Floodplain, Floodway, and Erosion Hazard Zones Areas Sorted by TAG

LEGEND:

- 100% of parcel is within the FEMA 100-yr Floodway and the Erosion Control Zone
- 100% of parcel is within the FEMA 100-yr Floodway
- 100% of parcel is within the Erosion Control Zone

			Area in acres (columns 4-5, 7, 9-10, 12-14)										
				FEMA 100-yr Floodplain		FEMA 100-yr Floodway		FEMA 100-yr Floodway Fringe	Erosion Hazard Zones				
									Erosion Control Zone				
Tag No. (1)	Assessors's Parcel Number (2)	Last Name (3)	Total Parcel (4)	Area (5)	% of Parcel (5)/(4) (6)	Area (7)	% of Parcel (7)/(4) (8)	(5)-(7) (9)	Area (12)+(13) (10)	% of Parcel (10)/(4) (11)	Severe (12)	Lateral Migration (13)	Long-Term (14)
195	203 32 003A	Knox	5.0	2.6	52.0%	1.8	36.0%	0.8	1.8	36.0%	0.8	1.0	1.3
197	203 38 001P	McClure	3.6	0.0	0.0%	0.0	0.0%	0.0	0.0	0.0%	0.0	0.0	0.1
203	203 38 001F	Brown	4.1	0.3	7.3%	0.0	0.0%	0.3	0.0	0.0%	0.0	0.0	1.6
205	203 38 001S	Dahl	3.4	0.7	20.6%	0.0	0.0%	0.7	0.0	0.0%	0.0	0.0	2.3
206	203 38 001R	Dail	1.2	1.2	100.0%	0.0	0.0%	1.2	0.0	0.0%	0.0	0.0	1.2
207	203 38 006	Carey	10.4	9.6	92.3%	2.4	23.1%	7.2	4.0	38.5%	2.6	1.4	6.4
208	203 38 005	Carey	9.9	1.6	16.2%	0.0	0.0%	1.6	0.0	0.0%	0.0	0.0	4.5
212	203 38 004	Ingber	10.3	10.3	100.0%	7.7	74.8%	2.6	9.8	95.1%	8.6	1.2	0.5
213	203 38 009A	Blessent	9.5	6.6	69.5%	0.0	0.0%	6.6	1.0	10.5%	0.1	0.9	7.1
214	203 25 001B	TRAMONTO DEVELO	166.5	1.4	0.8%	0.7	0.4%	0.7	1.5	0.9%	1.2	0.3	1.7
215	203 26 001	TRAMONTO DEVELO	320.9	57.9	18.0%	55.6	17.3%	2.3	57.7	18.0%	47.0	10.7	13.2
216	203 26 002	TRAMONTO DEVELO	292.4	48.4	16.6%	39.6	13.5%	8.8	48.9	16.7%	21.6	27.3	20.5
217	204 02 001E	CANYON INVESTORS	68.9	0.0	0.0%	0.0	0.0%	0.0	4.1	6.0%	2.0	2.1	2.3
218	204 02 003A	Azar	80.4	0.0	0.0%	0.0	0.0%	0.0	0.0	0.0%	0.0	0.0	0.5
219	204 02 001D	CANYON INVESTORS	8.9	0.0	0.0%	0.0	0.0%	0.0	8.2	92.1%	7.6	0.6	0.4
223	204 02 001C	CANYON INVESTORS	2.3	0.0	0.0%	0.0	0.0%	0.0	2.3	100.0%	2.3	0.0	0.0
233	204 02 002A	CANYON INVESTORS	80.2	0.0	0.0%	0.0	0.0%	0.0	24.9	31.0%	3.9	21.0	4.9
234	204 02 004	BAHA PROPERTIES	121.9	0.0	0.0%	0.0	0.0%	0.0	24.2	19.9%	21.0	3.2	1.6
237	211 25 001	SECURITY TITLE AG	320.1	0.0	0.0%	0.0	0.0%	0.0	4.7	1.5%	1.6	3.1	12.8
244	204 11 002D	Hardy	30.2	0.0	0.0%	0.0	0.0%	0.0	13.0	43.0%	7.0	6.0	2.6
246	204 11 002F	Propst	19.9	0.0	0.0%	0.0	0.0%	0.0	10.3	51.8%	8.3	2.0	2.4
247	204 11 002E	Baziotes	29.0	0.0	0.0%	0.0	0.0%	0.0	10.1	34.8%	7.1	3.0	1.1
249	204 12 001	SECURITY TITLE AG	160.2	0.0	0.0%	0.0	0.0%	0.0	0.3	0.2%	0.0	0.3	1.5
252	204 11 002G	Cheuvront	39.9	0.0	0.0%	0.0	0.0%	0.0	7.5	18.8%	2.4	5.1	3.3
254	204 11 002K	LONE MOUNTAIN ROA	10.3	0.0	0.0%	0.0	0.0%	0.0	0.2	1.9%	0.0	0.2	0.9
255	204 11 002L	LONE MOUNTAIN ROA	10.1	0.0	0.0%	0.0	0.0%	0.0	8.1	80.2%	2.9	5.2	1.3
257	204 11 002J	LONE MOUNTAIN ROA	20.2	0.0	0.0%	0.0	0.0%	0.0	10.9	54.0%	6.0	4.9	2.3
258	204 13 001J	Koors	10.2	0.0	0.0%	0.0	0.0%	0.0	4.5	44.1%	2.1	2.4	2.7
259	204 13 001T	Novak Family Llc	70.4	0.0	0.0%	0.0	0.0%	0.0	7.4	10.5%	3.5	3.9	4.7
260	204 13 001N		10.9	0.0	0.0%	0.0	0.0%	0.0	0.0	0.0%	0.0	0.0	0.7
263	204 13 003A	ROTH INVESTMENT P	40.3	0.0	0.0%	0.0	0.0%	0.0	0.0	0.0%	0.0	0.0	1.3
265	204 13 001H	Koors	8.7	0.0	0.0%	0.0	0.0%	0.0	1.8	20.7%	0.5	1.3	0.9
267	204 13 001F	Sanchez	9.4	0.0	0.0%	0.0	0.0%	0.0	1.3	13.8%	0.0	1.3	3.8
268	204 13 001G	Evans	9.1	0.0	0.0%	0.0	0.0%	0.0	3.6	39.6%	0.5	3.1	3.7
269	204 13 001U	NOVAK FAMILY L L	29.7	0.0	0.0%	0.0	0.0%	0.0	16.7	56.2%	5.2	11.5	5.2
270	204 13 003B	NOVAK FAMILY LLC	39.3	0.0	0.0%	0.0	0.0%	0.0	10.9	27.7%	2.8	8.1	4.3
275	204 13 002A	PLATEAU VENTURES	119.1	0.0	0.0%	0.0	0.0%	0.0	43.5	36.5%	11.1	32.4	21.3
276	204 13 002B	ROTH INVESTMENT P	40.2	0.0	0.0%	0.0	0.0%	0.0	0.0	0.0%	0.0	0.0	0.4
285	204 24 002C		15.5	0.0	0.0%	0.0	0.0%	0.0	7.7	49.7%	2.6	5.1	3.6
286	204 24 006E	L-MAR INVESTMENT	48.7	0.0	0.0%	0.0	0.0%	0.0	8.4	17.2%	0.4	8.0	3.1
287	204 23 011	L-MAR INVESTMENT	77.7	0.0	0.0%	0.0	0.0%	0.0	55.1	70.9%	24.2	30.9	11.7

APPENDIX C, TABLE C-1
SKUNK CREEK WATERCOURSE MASTER PLAN, PHASE 2
List of Floodplain, Floodway, and Erosion Hazard Zones Areas Sorted by TAG

LEGEND:

- 100% of parcel is within the FEMA 100-yr Floodway and the Erosion Control Zone
- 100% of parcel is within the FEMA 100-yr Floodway
- 100% of parcel is within the Erosion Control Zone

			Area in acres (columns 4-5, 7, 9-10, 12-14)										
				FEMA 100-yr Floodplain		FEMA 100-yr Floodway		FEMA 100-yr Floodway Fringe	Erosion Hazard Zones				
									Erosion Control Zone				
Tag No. (1)	Assessors's Parcel Number (2)	Last Name (3)	Total Parcel (4)	Area (5)	% of Parcel (5)/(4) (6)	Area (7)	% of Parcel (7)/(4) (8)	(5)-(7) (9)	Area (12)+(13) (10)	% of Parcel (10)/(4) (11)	Severe (12)	Lateral Migration (13)	Long-Term (14)
290	204 24 002B	Fleitz	14.8	0.0	0.0%	0.0	0.0%	0.0	4.3	29.1%	1.9	2.4	4.1
293	204 24 002H	Llanes	4.6	0.0	0.0%	0.0	0.0%	0.0	2.3	50.0%	1.3	1.0	0.5
294	204 24 002G	Berger	9.5	0.0	0.0%	0.0	0.0%	0.0	1.6	16.8%	1.0	0.6	0.3
295	204 23 010	UNITED STATES OF	40.2	0.0	0.0%	0.0	0.0%	0.0	37.5	93.3%	26.7	10.8	0.6
296	204 23 005E	AUSTRALIAN NATIVE	14.9	0.0	0.0%	0.0	0.0%	0.0	12.5	83.9%	4.3	8.2	1.0
299	204 24 006F	UNITED STATES OF	10.4	0.0	0.0%	0.0	0.0%	0.0	6.9	66.3%	1.9	5.0	1.7
300	204 24 002F	DYNAMITE 45 PROPE	9.7	0.0	0.0%	0.0	0.0%	0.0	0.6	6.2%	0.0	0.6	1.0
301	204 24 006D	UNITED STATES OF	13.7	0.0	0.0%	0.0	0.0%	0.0	12.3	89.8%	5.0	7.3	1.4
302	204 23 005G	U S BUREAU OF REC	1.5	0.0	0.0%	0.0	0.0%	0.0	1.5	100.0%	1.5	0.0	0.0
303	204 24 002K	DYNAMITE 45 PROPE	9.4	0.0	0.0%	0.0	0.0%	0.0	0.0	0.0%	0.0	0.0	1.4
304	204 24 006B	UNITED STATES OF	9.6	0.0	0.0%	0.0	0.0%	0.0	8.2	85.4%	6.7	1.5	0.2
306	204 23 005D	U S BUREAU OF REC	8.0	0.0	0.0%	0.0	0.0%	0.0	8.0	100.0%	5.0	3.0	0.0
307	204 23 005F	U S BUREAU OF REC	4.0	0.0	0.0%	0.0	0.0%	0.0	4.0	100.0%	0.0	4.0	0.0
310	204 24 002L	Llanes	9.4	0.0	0.0%	0.0	0.0%	0.0	0.0	0.0%	0.0	0.0	0.4
316	204 24 005N	U S BUREAU OF REC	3.0	0.0	0.0%	0.0	0.0%	0.0	0.0	0.0%	0.0	0.0	0.4
317	204 24 005M	UNITED STATES OF	38.3	0.0	0.0%	0.0	0.0%	0.0	2.5	6.5%	0.7	1.8	1.8
320	204 23 009N	UNITED STATES OF	7.9	0.0	0.0%	0.0	0.0%	0.0	1.5	19.0%	0.2	1.3	0.5
444	202 09 013D	Arizona Board Of Regents	9.6	0.0	0.0%	0.0	0.0%	0.0	0.4	4.2%	0.1	0.3	0.7
448	202 09 013J	Byrne Nicole W	5.6	0.0	0.0%	0.0	0.0%	0.0	1.1	19.6%	1.1	0.0	0.2
498	202 15 001	State of Arizona	639.3	34.1	5.3%	2.6	0.4%	31.5	18.0	2.8%	3.2	14.8	20.3
499	202 16 001A	Smith Vincent O;Patty A	4.1	1.7	41.5%	0.0	0.0%	1.7	1.5	36.6%	0.0	1.5	2.0
500	202 16 002	Smith Vincent O;Patty A	5.1	1.9	37.3%	0.0	0.0%	1.9	1.4	27.5%	0.0	1.4	3.7
501	202 16 003D	Eastin Ronald C;Ann E Tr	9.9	0.0	0.0%	0.0	0.0%	0.0	4.2	42.4%	3.3	0.9	1.1
502	202 16 003E	Bees Linda K	4.8	0.0	0.0%	0.0	0.0%	0.0	0.0	0.0%	0.0	0.0	2.6
503	202 16 003K	Eastman Donald D Jr;Deborah K	2.6	0.0	0.0%	0.0	0.0%	0.0	2.2	84.6%	1.6	0.6	0.4
504	202 16 003L	Mathews Sandra	1.5	0.0	0.0%	0.0	0.0%	0.0	1.0	66.7%	0.2	0.8	0.5
505	202 16 003M	Karns Victor N;Andrea F	1.3	0.0	0.0%	0.0	0.0%	0.0	0.8	61.5%	0.0	0.8	0.5
506	202 16 004D	Reed	2.1	2.1	100.0%	0.3	14.3%	1.8	0.9	42.9%	0.6	0.3	1.2
507	202 16 004E	Shelton	1.6	0.2	12.5%	0.1	6.3%	0.1	0.4	25.0%	0.3	0.1	0.3
508	202 16 004F	Shelton	1.3	0.0	0.0%	0.0	0.0%	0.0	0.3	23.1%	0.1	0.2	0.3
509	202 16 004G	Reed	3.6	1.8	50.0%	0.2	5.6%	1.6	1.2	33.3%	0.8	0.4	1.6
510	202 16 004H	Sellett	1.5	1.4	93.3%	0.1	6.7%	1.3	0.6	40.0%	0.4	0.2	0.9
511	202 16 005E	Brakefield Benjamin Wade;Jacqueline F	5.4	3.4	63.0%	0.0	0.0%	3.4	1.5	27.8%	0.0	1.5	3.2
512	202 16 005F	Fitts John W;Cora R Burgess	5.3	5.3	100.0%	0.9	17.0%	4.4	5.0	94.3%	1.2	3.8	0.3
513	202 16 005G	Sasfai John W;Dale E	5.9	5.2	88.1%	1.4	23.7%	3.8	5.1	86.4%	1.6	3.5	0.8
517	202 16 006G	Sisson Errol R;Martha R	2.6	0.1	3.8%	0.0	0.0%	0.1	0.0	0.0%	0.0	0.0	0.1
518	202 16 006H	Hammond Joel Wayne	2.3	0.3	13.0%	0.0	0.0%	0.3	0.0	0.0%	0.0	0.0	0.5
519	202 16 006J	Lopez Manuel R;Mary J	2.1	0.1	4.8%	0.0	0.0%	0.1	0.0	0.0%	0.0	0.0	0.4
520	202 16 006K	Russell William C;Tamaria L	2.4	2.4	100.0%	0.0	0.0%	2.4	0.1	4.2%	0.0	0.1	2.3
529	202 16 009	Deleano Tony;Antoinette B	3.2	0.1	3.1%	0.1	3.1%	0.0	1.8	56.3%	0.6	1.2	0.9
532	202 16 010Q	Hammond Thelma L	0.5	0.3	60.0%	0.0	0.0%	0.3	0.0	0.0%	0.0	0.0	0.3

APPENDIX C, TABLE C-1
SKUNK CREEK WATERCOURSE MASTER PLAN, PHASE 2
List of Floodplain, Floodway, and Erosion Hazard Zones Areas Sorted by TAG

LEGEND:

- 100% of parcel is within the FEMA 100-yr Floodway and the Erosion Control Zone
- 100% of parcel is within the FEMA 100-yr Floodway
- 100% of parcel is within the Erosion Control Zone

			Area in acres (columns 4-5, 7, 9-10, 12-14)										
				FEMA 100-yr Floodplain		FEMA 100-yr Floodway		FEMA 100-yr Floodway Fringe	Erosion Hazard Zones				
									Erosion Control Zone				
Tag No. (1)	Assessors's Parcel Number (2)	Last Name (3)	Total Parcel (4)	Area (5)	% of Parcel (5)/(4) (6)	Area (7)	% of Parcel (7)/(4) (8)	(5)-(7) (9)	Area (12)+(13) (10)	% of Parcel (10)/(4) (11)	Severe (12)	Lateral Migration (13)	Long-Term (14)
539	202 16 012K	Nickerson Dorothy	1.3	1.3	100.0%	0.0	0.0%	1.3	0.4	30.8%	0.0	0.4	0.9
540	202 16 012L	Pirri Anthony J;Margaret L	2.5	2.5	100.0%	0.7	28.0%	1.8	2.5	100.0%	1.5	1.0	0.0
541	202 16 012L	Pirri Anthony J;Margaret L	0.2	0.2	100.0%	0.0	0.0%	0.2	0.2	100.0%	0.0	0.2	0.0
542	202 16 012M	Sherick William Robert Jr	2.0	2.0	100.0%	0.0	0.0%	2.0	0.6	30.0%	0.1	0.5	1.4
543	202 16 012P	Currey Albert Ben;Angela Denise	1.5	1.5	100.0%	0.0	0.0%	1.5	1.5	100.0%	0.0	1.5	0.0
544	202 16 012R	Laorr Anan K;Eileen	1.6	1.6	100.0%	0.0	0.0%	1.6	1.6	100.0%	0.0	1.6	0.0
545	202 16 012S	Currey Albert Ben;Angela Denise	1.4	1.4	100.0%	0.0	0.0%	1.4	1.4	100.0%	0.0	1.4	0.0
546	202 16 012T	Sutton Sandra L;Davidson Susan J	1.4	1.4	100.0%	0.0	0.0%	1.4	1.4	100.0%	0.0	1.4	0.0
547	202 16 012U	Sutton Sandra L;Davidson Susan J	0.3	0.3	100.0%	0.0	0.0%	0.3	0.3	100.0%	0.0	0.3	0.0
548	202 16 012V	Davidson Marion J;Susan J	3.5	3.5	100.0%	0.0	0.0%	3.5	3.5	100.0%	0.0	3.5	0.0
549	202 16 012V	Davidson Marion J;Susan J	1.6	1.6	100.0%	0.8	50.0%	0.8	1.6	100.0%	0.9	0.7	0.0
551	202 16 013B	Groves Carl E	10.1	4.6	45.5%	0.0	0.0%	4.6	3.1	30.7%	0.0	3.1	2.4
561	202 16 N/A		1.7	1.7	100.0%	0.1	5.9%	1.6	1.7	100.0%	0.4	1.3	0.0
575	202 21 007A	Hare Investments Ltd Prtnrsp	20.5	0.0	0.0%	0.0	0.0%	0.0	1.4	6.8%	1.0	0.4	0.6
578	202 21 008S	Kraus Investments L C	1.3	0.0	0.0%	0.0	0.0%	0.0	0.0	0.0%	0.0	0.0	0.2
579	202 21 008T	Kraus Investments L C	36.4	15.2	41.8%	6.8	18.7%	8.4	12.5	34.3%	10.6	1.9	12.3
583	202 21 013L	Stein G S;A F;Reich S;Pelman Ltd Partner	9.0	6.8	75.6%	6.5	72.2%	0.3	7.0	77.8%	6.7	0.3	0.8
584	202 21 013M	Funk Donna M;Proulx Bradley E	9.4	8.3	88.3%	6.4	68.1%	1.9	7.8	83.0%	7.1	0.7	1.1
585	202 21 013R	Eller	9.2	9.2	100.0%	7.8	84.8%	1.4	8.9	96.7%	5.2	3.7	0.3
595	202 21 016D	Funk Donna M	2.4	0.9	37.5%	0.6	25.0%	0.3	0.9	37.5%	0.8	0.1	0.5
597	202 21 016H		1.7	0.5	29.4%	0.4	23.5%	0.1	0.5	29.4%	0.5	0.0	0.3
598	202 21 016J	Inukai George;Kerry	1.9	0.5	26.3%	0.4	21.1%	0.1	0.5	26.3%	0.5	0.0	0.3
603	202 21 018D	Schartz Chales A	4.7	1.6	34.0%	1.2	25.5%	0.4	1.7	36.2%	1.6	0.1	0.8
604	202 21 018E	Swartz Charles A	4.6	1.1	23.9%	0.1	2.2%	1.0	1.0	21.7%	0.6	0.4	0.5
615	202 21 024A	Lund Wayne E	4.2	4.2	100.0%	3.8	90.5%	0.4	3.9	92.9%	3.0	0.9	0.3
616	202 21 024B	Albert	4.5	4.5	100.0%	3.5	77.8%	1.0	3.7	82.2%	2.4	1.3	0.8
617	202 21 025B	Culp Oscar A;Peggy J	4.8	0.8	16.7%	0.1	2.1%	0.7	0.6	12.5%	0.1	0.5	0.4
620	202 21 025F	Grace Marion C	1.2	0.3	25.0%	0.0	0.0%	0.3	0.2	16.7%	0.1	0.1	0.2
621	202 21 025G	Grace William Cecil Ii	1.3	0.2	15.4%	0.0	0.0%	0.2	0.2	15.4%	0.0	0.2	0.1
625	202 21 028A	Watkins L Allyn Tr	4.7	0.8	17.0%	0.3	6.4%	0.5	0.7	14.9%	0.5	0.2	0.6
626	202 21 028B	Schwarze Robert C;Tracey O	2.2	0.6	27.3%	0.2	9.1%	0.4	0.3	13.6%	0.2	0.1	0.4
630	202 21 030A	Klug Sande	4.9	1.1	22.4%	0.0	0.0%	1.1	1.2	24.5%	1.0	0.2	0.3
631	202 21 030D	Andersen Sidney W;Lisa M	2.4	0.9	37.5%	0.0	0.0%	0.9	1.0	41.7%	0.7	0.3	0.2
634	202 21 031C	Selleys Charles T Tr	8.7	7.5	86.2%	6.5	74.7%	1.0	6.1	70.1%	3.3	2.8	1.8
635	202 21 031E	Kraus Investments Lc	9.0	7.6	84.4%	5.9	65.6%	1.7	7.7	85.6%	7.0	0.7	0.7
636	202 21 031J	Sartain James P;Wanda A	4.6	4.6	100.0%	4.5	97.8%	0.1	4.6	100.0%	4.4	0.2	0.0
637	202 21 031L	Smith Cheryl Leah Smith;Sartain Wanda	0.8	0.2	25.0%	0.0	0.0%	0.2	0.2	25.0%	0.2	0.0	0.1
639	202 21 031Q	Sartain James P;Wanda A	2.7	2.3	85.2%	1.4	51.9%	0.9	1.8	66.7%	0.7	1.1	0.7
640	202 21 031R	Davis Wm G;Rose Mary	0.7	0.7	100.0%	0.7	100.0%	0.0	0.7	100.0%	0.3	0.4	0.0
641	202 21 031S	Henscheid Lawrence Steve	2.3	1.8	78.3%	1.5	65.2%	0.3	1.8	78.3%	1.0	0.8	0.4
642	202 21 031T	Henscheid Lawrence Steve	2.6	1.4	53.8%	1.2	46.2%	0.2	0.7	26.9%	0.0	0.7	1.3

APPENDIX C, TABLE C-1
SKUNK CREEK WATERCOURSE MASTER PLAN, PHASE 2
List of Floodplain, Floodway, and Erosion Hazard Zones Areas Sorted by TAG

LEGEND:
- 100% of parcel is within the FEMA 100-yr Floodway and the Erosion Control Zone
- 100% of parcel is within the FEMA 100-yr Floodway
- 100% of parcel is within the Erosion Control Zone

			Area in acres (columns 4-5, 7, 9-10, 12-14)										
				FEMA 100-yr Floodplain		FEMA 100-yr Floodway		FEMA 100-yr Floodway Fringe	Erosion Hazard Zones				
									Erosion Control Zone				
Tag No. (1)	Assessors's Parcel Number (2)	Last Name (3)	Total Parcel (4)	Area (5)	% of Parcel (5)/(4) (6)	Area (7)	% of Parcel (7)/(4) (8)	(5)-(7) (9)	Area (12)+(13) (10)	% of Parcel (10)/(4) (11)	Severe (12)	Lateral Migration (13)	Long-Term (14)
643	202 21 031U	Hearne Charles P;L S Henscheid	4.6	4.6	100.0%	4.6	100.0%	0.0	4.5	97.8%	2.9	1.6	0.1
647	202 21 032A	Caldwell David L;Carol A	4.7	4.7	100.0%	4.7	100.0%	0.0	1.1	23.4%	0.0	1.1	3.6
648	202 21 032D	Norris Dean U;Juanita	3.0	0.8	26.7%	0.6	20.0%	0.2	0.0	0.0%	0.0	0.0	0.8
650	202 21 032F	Vaughan Hazel A;Matthew P;Elizabeth B	1.6	0.6	37.5%	0.5	31.3%	0.1	0.0	0.0%	0.0	0.0	0.8
655	202 21 035A	Jenkins Robert L;Virginia A	1.6	0.9	56.3%	0.6	37.5%	0.3	0.7	43.8%	0.6	0.1	0.4
656	202 21 035B	Jenkins Robert L;Virginia A	7.5	1.5	20.0%	1.1	14.7%	0.4	1.5	20.0%	1.4	0.1	0.9
657	202 21 036D	Goveia Richard A;Roberta Lynn	1.7	0.1	5.9%	0.3	17.6%	-0.2	0.0	0.0%	0.0	0.0	0.0
658	202 21 036F	Pino Victor;Josephine Ann	1.5	1.2	80.0%	1.5	100.0%	-0.3	0.0	0.0%	0.0	0.0	0.0
659	202 21 036G	Andree Wallace D Jr;Vicki L	3.2	0.4	12.5%	0.5	15.6%	-0.1	0.0	0.0%	0.0	0.0	0.0
661	202 21 036L	Miller Jeffrey B;Maureen M	1.6	1.6	100.0%	1.6	100.0%	0.0	0.0	0.0%	0.0	0.0	0.0
662	202 21 036M	Thompson Gale P	1.4	1.4	100.0%	1.4	100.0%	0.0	0.0	0.0%	0.0	0.0	0.0
669	202 21 039A	Cuthbertson Dennis E;Kathryn R	4.5	0.4	8.9%	0.5	11.1%	-0.1	0.0	0.0%	0.0	0.0	0.0
670	202 21 039C	Cuthbertson Dennis;Kathryn	2.3	2.3	100.0%	2.3	100.0%	0.0	0.0	0.0%	0.0	0.0	0.0
671	202 21 039D	Russell Wade William	1.1	0.1	9.1%	0.0	0.0%	0.1	0.0	0.0%	0.0	0.0	0.0
672	202 21 039E	Pinckard Sam Lowell	1.3	0.2	15.4%	0.1	7.7%	0.1	0.0	0.0%	0.0	0.0	0.0
673	202 21 040A	Crandell Raymond;Connie	4.5	0.6	13.3%	0.6	13.3%	0.0	0.0	0.0%	0.0	0.0	0.0
674	202 21 040B	Mcallister Paul H;Ann	4.9	0.2	4.1%	0.2	4.1%	0.0	0.0	0.0%	0.0	0.0	0.0
678	202 21 042D	Gregg George R Iii;Julie	4.6	0.4	8.7%	0.0	0.0%	0.4	0.0	0.0%	0.0	0.0	0.8
685	202 21 042Q	Jensen Jason R	2.2	0.1	4.5%	0.0	0.0%	0.1	0.0	0.0%	0.0	0.0	0.3
705	202 21 049	Anderson Gladys F Tr	8.7	2.7	31.0%	0.0	0.0%	2.7	0.0	0.0%	0.0	0.0	3.1
713	202 21 055	Williams Jody Ann	1.4	0.1	7.1%	0.0	0.0%	0.1	0.1	7.1%	0.0	0.1	0.3
802	202 21 130	Svoboda Frank;Dorothy N Tr	3.9	0.3	7.7%	0.0	0.0%	0.3	0.4	10.3%	0.2	0.2	0.5
803	202 21 131	Glass Timothy A;Judy R	5.3	4.2	79.2%	3.2	60.4%	1.0	4.6	86.8%	3.8	0.8	0.7
804	202 21 132A	Dagburg L L C	2.5	0.1	4.0%	0.0	0.0%	0.1	0.1	4.0%	0.0	0.1	1.5
815	202 21 142	Hilburn Joan L;Dean R	5.3	0.1	1.9%	0.0	0.0%	0.1	0.0	0.0%	0.0	0.0	0.4
816	202 21 143A	Hilburn Joan L;Dean R	3.6	2.2	61.1%	0.4	11.1%	1.8	2.6	72.2%	1.9	0.7	0.7
817	202 21 143B	Hafler Evelyn M;Lehman Sandra J	0.8	0.8	100.0%	0.5	62.5%	0.3	0.8	100.0%	0.8	0.0	0.0
818	202 21 144	George T;Kris E Pingitore Trust	3.8	1.1	28.9%	0.5	13.2%	0.6	1.4	36.8%	1.1	0.3	0.7
819	202 21 145	Barnes J R;Carol J	5.0	2.5	50.0%	1.7	34.0%	0.8	3.0	60.0%	2.4	0.6	1.1
820	202 21 146A	Matta Stacey M	1.6	1.3	81.3%	0.2	12.5%	1.1	1.6	100.0%	1.5	0.1	0.0
821	202 21 146B	Mata Stacey M	2.8	2.3	82.1%	0.5	17.9%	1.8	2.3	82.1%	1.5	0.8	0.5
822	202 21 147A	Wright Michael	2.7	2.0	74.1%	0.0	0.0%	2.0	2.0	74.1%	1.1	0.9	0.7
823	202 21 147B	Hafler Evelyn M;Lehman Sandra J	2.4	2.4	100.0%	0.6	25.0%	1.8	2.3	95.8%	2.0	0.3	0.1
824	202 21 148	Lambeth Harold R;Marilyn L	4.8	4.5	93.8%	0.4	8.3%	4.1	3.7	77.1%	1.6	2.1	1.1
825	202 21 149	Robinson Dennis J;Karen J	4.6	4.1	89.1%	0.3	6.5%	3.8	3.4	73.9%	2.1	1.3	1.1
826	202 21 150	Parry Michael K;Debra T	3.9	3.8	97.4%	0.8	20.5%	3.0	3.3	84.6%	2.8	0.5	0.6
827	202 21 151	Griswold Kirk Jay	5.4	3.5	64.8%	2.3	42.6%	1.2	3.5	64.8%	2.9	0.6	0.5
828	202 21 152	Crawford John Paul;Ellen Marie	5.1	1.4	27.5%	0.3	5.9%	1.1	1.0	19.6%	0.7	0.3	0.6
829	202 21 153	Moore Michael D;Darcy L	5.0	2.1	42.0%	0.6	12.0%	1.5	2.9	58.0%	2.7	0.2	1.0
830	202 21 154	Albillar Robert J;Lisa A	4.9	2.2	44.9%	0.6	12.2%	1.6	1.5	30.6%	1.4	0.1	1.4
831	202 21 155	Donaldson David;Mary Lou	4.9	1.9	38.8%	0.8	16.3%	1.1	1.5	30.6%	1.4	0.1	1.0

APPENDIX C, TABLE C-1
SKUNK CREEK WATERCOURSE MASTER PLAN, PHASE 2
List of Floodplain, Floodway, and Erosion Hazard Zones Areas Sorted by TAG

LEGEND:

- 100% of parcel is within the FEMA 100-yr Floodway and the Erosion Control Zone
- 100% of parcel is within the FEMA 100-yr Floodway
- 100% of parcel is within the Erosion Control Zone

			Area in acres (columns 4-5, 7, 9-10, 12-14)										
				FEMA 100-yr Floodplain		FEMA 100-yr Floodway		FEMA 100-yr Floodway Fringe	Erosion Hazard Zones				
									Erosion Control Zone				
Tag No. (1)	Assessors's Parcel Number (2)	Last Name (3)	Total Parcel (4)	Area (5)	% of Parcel (5)/(4) (6)	Area (7)	% of Parcel (7)/(4) (8)	(5)-(7) (9)	Area (12)+(13) (10)	% of Parcel (10)/(4) (11)	Severe (12)	Lateral Migration (13)	Long-Term (14)
832	202 21 156	Carson Billy J;Debra Ann	5.2	2.1	40.4%	1.0	19.2%	1.1	1.7	32.7%	1.5	0.2	1.1
833	202 21 157	Sullivan John J;Miava	5.5	2.9	52.7%	0.8	14.5%	2.1	2.9	52.7%	2.6	0.3	1.0
843	202 21 166	Law Michael L;Valys U	2.6	0.7	26.9%	0.4	15.4%	0.3	0.8	30.8%	0.5	0.3	0.4
844	202 21 167A	Law Michael L;Valys U	2.6	0.5	19.2%	0.3	11.5%	0.2	0.6	23.1%	0.4	0.2	0.4
845	202 21 167B	Klusek Andrew P	2.3	0.5	21.7%	0.1	4.3%	0.4	0.5	21.7%	0.4	0.1	0.1
846	202 21 168	Roler	4.7	4.6	97.9%	2.8	59.6%	1.8	4.6	97.9%	3.3	1.3	0.1
847	202 21 169	Hines	4.5	4.4	97.8%	3.5	77.8%	0.9	4.3	95.6%	3.3	1.0	0.2
853	202 21 175	Maynard	4.7	3.6	76.6%	2.2	46.8%	1.4	3.6	76.6%	2.9	0.7	0.5
854	202 21 176	Bierbaum Leon D;Ronda Y	4.6	3.6	78.3%	2.3	50.0%	1.3	3.6	78.3%	3.1	0.5	0.4
929	211 50 016H	Birdsell Carl C; Russell L; Lois	2.5	2.5	100.0%	2.5	100.0%	0.0	2.5	100.0%	1.9	0.6	0.0
930		State Of Arizona	802.8	132.5	16.5%	87.3	10.9%	45.2	118.8	14.8%	94.2	24.6	58.9
931		State Of Arizona	5918.1	94.3	1.6%	30.8	0.5%	63.5	73.0	1.2%	39.4	33.6	31.7

Appendix D

List of Structures Located within the Floodplain, Floodway and Erosion Hazard Zones for each Property

APPENDIX D, TABLE D-1
SKUNK CREEK WATERCOURSE MASTER PLAN, PHASE 2
List of All Structures Located within the Floodway, Floodplain and Erosion Hazard Zones Sorted by TAG
(from aerial photos taken July, 1999)

				HEC-RAS Cross Section		Cross	FEMA 100-year		Erosion Hazard Zone			Elevations		
Tag ID (1)	Assessors's Parcel Number (2)	Last Name (3)	Structure (4)	Down Stream (5)	Up Stream (6)	Section @Struct. (7)	Floodway (8)	Floodway Fringe (9)	Severe (10)	Lateral Migration (11)	Long-Term (12)	Water Surface (13)	Finished Floor (14)	Difference (13)-(14) (15)
4	211-22-002K		House	22.73	22.79			X			X			
5	211-22-002B	McKeag	Garage	22.86	22.95	13	X		X			1967.00	1964.01	2.99
5	211-22-002B	McKeag	House	22.86	22.95	14	X		X			1968.29	1965.25	3.04
6	211-22-002J	Geraci	Mobile	22.86	22.95	12	X		X			1965.40	1965.42	-0.02
7	211-22-002H	Geraci	3 Barns	22.79	22.86		X		X					
35	211-50-007A	McCartney	House	20.62	20.79			X			X			
36	211-50-007C	Nicholson	Shed	20.62	20.79		X			X				
36	211-50-007C	Nicholson	Mobile	20.62	20.79			X			X			
41	211-50-015A	Gellerman	House	20.64	20.71	11		X		X		1853.22	1855.30	-2.08
50	211-50-007B	Jorgensen	House	20.62	20.79			X			X			
60	211-50-028C	Jones	Barn	20.62	20.79			X			X			
62	211-50-022	Hopwood	Mobile 2	20.48	20.62	7	X			X		1843.80	1844.34	-0.54
62	211-50-022	Hopwood	House 1	20.48	20.62	8	X		X			1844.89	1844.87	0.02
62	211-50-022	Hopwood	Mobile 3	20.48	20.62	9	X				X	1845.66	1845.22	0.44
62	211-50-022	Hopwood	Mobile 1	20.48	20.62	10	X		X			1847.62	1848.55	-0.93
62	211-50-022	Hopwood	House 2	20.48	20.62			X			X	1845.66[1]	1845.48	0.18
84	211-50-016J	Harper	Mobile 3	20.38	20.48	4	X				X	1839.39	1840.43	-1.04
84	211-50-016J	Harper	Mobile 2	20.38	20.48	5	X				X	1839.39	1840.32	-0.93
84	211-50-016J	Harper	Mobile 1	20.38	20.48	6	X				X	1840.58	1842.17	-1.59
104	211-50-037C	Mathis	Mobile	20.26	20.38	1	X			X		1830.65	1831.54	-0.89
104	211-50-037C	Mathis	Building	20.26	20.38	2	X			X		1832.22	1830.92	1.30
104	211-50-037C	Mathis	House	20.26	20.38	3	X			X		1833.30	1832.54	0.76
107	211-50-020C	Masters	Barn	20.38	20.48			X			X			
148	203-32-006	Parks	Mobile	19.62	19.72				X					
178	203-32-005D	Melvin	House	19.52	19.62						X	1795.51	1797.67	-2.16
185	203-32-005B	Damer	House	19.41	19.52			X			X	1794.12	1795.34	-1.22
190	203-32-003B	Damer	House	19.41	19.52			X			X	1792.65	1795.49	-2.84
206	203-38-001R	Dail	House	18.23	18.29			X			X			
506	202-16-004D	Reed	House	25.95	26.17			X			X			
510	202-16-004H	Sellett	House	25.95	26.17			X		X				
511	202-16-005E	Brakefield Benjamin Wade;Jacqu	Mobile	25.95	26.17			X			X			
512	202-16-005F	Fitts John W;Cora R Burgess	House	25.83	25.95			X		X				
520	202-16-006K	Russell William C;Tamaria L	House	25.83	25.95			X			X			
520	202-16-006K	Russell William C;Tamaria L	Mobile	25.83	25.95									
539	202-16-012K	Nickerson Dorothy	House	25.83	25.95			X			X			
539	202-16-012K	Nickerson Dorothy	House	25.83	25.95			X			X			
540	202-16-012L	Pirri Anthony J;Margaret L	House	25.83	25.95	24		X		X		2116.06	2118.05	-1.99
540	202-16-012L	Pirri Anthony J;Margaret L	Building	25.83	25.95	25		X		X		2116.39	2117.97	-1.58
542	202-16-012M	Sherick William Robert Jr	House	25.83	25.95			X		X				
543	202-16-012P	Currey Albert Ben;Angela Denise	House	25.83	25.95			X		X				
546	202-16-012T	Sutton Sandra L;Davidson Susan	House	25.70	---			X		X				
548	202-16-012V	Davidson Marion J;Susan J	House U.C.	25.70	25.72			X		X				

APPENDIX D, TABLE D-1
SKUNK CREEK WATERCOURSE MASTER PLAN, PHASE 2
List of All Structures Located within the Floodway, Floodplain and Erosion Hazard Zones Sorted by TAG
(from aerial photos taken July, 1999)

Tag ID (1)	Assessors's Parcel Number (2)	Last Name (3)	Structure (4)	HEC-RAS Cross Section: Down Stream (5)	HEC-RAS Cross Section: Up Stream (6)	Cross Section @Struct. (7)	FEMA 100-year: Floodway (8)	FEMA 100-year: Floodway Fringe (9)	Erosion Hazard Zone: Severe (10)	Erosion Hazard Zone: Lateral Migration (11)	Erosion Hazard Zone: Long-Term (12)	Elevations: Water Surface (13)	Elevations: Finished Floor (14)	Elevations: Difference (13)-(14) (15)
551	202-16-013B	Groves Carl E	Mobile	25.83	25.95			X		X				
579	202-21-008T	Kraus Investments L C	Mobile	23.94	24.25			X	X					
579	202-21-008T	Kraus Investments L C	Mobile	23.94	24.25			X		X				
579	202-21-008T	Kraus Investments L C	2 Mobiles	23.94	24.25			X			X			
579	202-21-008T	Kraus Investments L C	Restaurant	23.94	24.25			X			X			
584	202-21-013M	Funk Donna M;Proulx Bradley E	House	23.33	23.45	21		X	X			1997.41	1996.58	0.83
584	202-21-013M	Funk Donna M;Proulx Bradley E	Garage	23.45	23.55	22		X	X			1999.19	1998.27	0.92
585	202-21-013R	Eller	House	22.95	23.13	18	X			X		1980.24	1979.29	0.95
615	202-21-024A	Lund Wayne E	Slab	22.86	22.95	15	X		X			1971.04	1969.10	1.94
616	202-21-024B	Albert	House	22.86	22.95	16	X		X			1973.36	1971.42	1.94
616	202-21-024B	Albert	Garage	22.95	23.13	17	X		X			1974.27	1971.41	2.86
634	202-21-031C	Selleys Charles T Tr	House	CL .327	CL .403	28	X				X	2024.80	2024 (G)	0.80
634	202-21-031C	Selleys Charles T Tr	House	CL .327	CL .403					X				
634	202-21-031C	Selleys Charles T Tr	Shed	CL .327	CL .403					X				
639	202-21-031Q	Sartain James P;Wanda A	House 1	23.64	23.87	23	X		X			2016.49	2017.10	-0.61
639	202-21-031Q	Sartain James P;Wanda A	House 2	23.64	23.87			X		X		2016.49[1]	2019.23	-2.74
647	202-21-032A	Caldwell David L;Carol A	House	CL .247	CL .327	26	X				X	2021.74	2021.44	0.30
647	202-21-032A	Caldwell David L;Carol A	Building	CL .247	CL .327	27	X			X		2020.17	2019.27	0.90
819	202-21-145	Barnes J R;Carol J	House	24.87	24.95			X	X					
821	202-21-146B	Mata Stacey M	House	24.87	---			X		X				
822	202-21-147A	Wright Michael	House	24.74	---			X		X				
824	202-21-148	Lambeth Harold R;Marilyn L	Mobile	24.61	24.74			X		X				
824	202-21-148	Lambeth Harold R;Marilyn L	House	24.61	24.74			X		X				
825	202-21-149	Robinson Dennis J;Karen J	House	24.48	24.61			X		X				
826	202-21-150	Parry Michael K;Debra T	Mobile	24.48	24.61			X	X					
826	202-21-150	Parry Michael K;Debra T	House	24.48	24.61			X		X				
829	202-21-153	Moore Michael D;Darcy L	House	24.61	24.74			X		X				
830	202-21-154	Albillar Robert J;Lisa A	Mobile	24.61	24.74			X			X			
832	202-21-156	Carson Billy J;Debra Ann	Shed	24.74	24.87			X		X				
846	202-21-168	Roler	House	23.13	23.25			X		X				
847	202-21-169	Hines	House	23.13	23.25	19	X		X			1984.20	1980.93	3.27
847	202-21-169	Hines	Garage	23.13	23.25	20	X		X			1984.20	1980.53	3.67
854	202-21-176	Bierbaum Leon D;Ronda Y	Mobile	23.33	23.45						X	1995.86	2000.54	-4.68
929	211-50-016H	Birdsell Carl C; Russell L; Lois	Mobile	20.38	20.45		X		X			1837.22	1837(G)	0.22

STRUCTURE COUNT									
Houses:	40	Houses	9	29	7	19	14	(2 houses are not in the floodplain)
Mobiles:	20	Mobiles	8	11	4	5	11	(1 mobile in Long Term is not in the floodplain)
Restaurants:	1	Restaurants	0	1	0	0	1	
Outbuildings:	16	Outbuildings	10	5	7	6	2	(1 shed in Long-Term is not in the floodplain)
Total:	77	TOTAL	27	46	18	30	28	

Notes:

APPENDIX D, TABLE D-1
SKUNK CREEK WATERCOURSE MASTER PLAN, PHASE 2
List of All Structures Located within the Floodway, Floodplain and Erosion Hazard Zones Sorted by TAG
(from aerial photos taken July, 1999)

				HEC-RAS Cross Section		Cross	FEMA 100-year		Erosion Hazard Zone			Elevations		
Tag ID (1)	Assessors's Parcel Number (2)	Last Name (3)	Structure (4)	Down Stream (5)	Up Stream (6)	Section @Struct. (7)	Floodway (8)	Floodway Fringe (9)	Severe (10)	Lateral Migration (11)	Long-Term (12)	Water Surface (13)	Finished Floor (14)	Difference (13)-(14) (15)

Outbuildings include grarages, sheds, buildings of unidentified use, and unoccupied slabs with mobile home hookups.
WSEL interpolated by Stantec

[1] WSEL set to match neighboring structure from our model

House U.C.= House under construction

Appendix E

Summary of Estimated Flow Rate and Recurrence Interval at Elevation of Finished Floor for Residences in Floodway and Severe Erosion Hazard Zone

APPENDIX E, TABLE E-1
SKUNK CREEK WATERCOURSE MASTER PLAN, PHASE 2
Estimated Flow Rate and Recurrence Interval at Elevation of Finished Floor
(sorted by column 14 and whether the structure is habitable)

Tag ID (1)	Assessors's Parcel Number (2)	Name (3)	Structure (4)	HEC-RAS Cross Section Down Stream (5)	HEC-RAS Cross Section Up Stream (6)	Cross Section @Struct. (7)	100-yr Water Surface (8)	Finished Floor Elevation[2] (FFE) (9)	Difference (8)-(9) (10)	FEMA Q_{100} (cfs) (11)	Q_{FFE} (cfs) (12)	Approx. Recurrence Interval (years) (13)	Approx. Chance of Flooding (14)	Overbank Flow Velocity (fps) (15)	Personal Hazard Factor $(10)*(15)^2$ (16)
62	211-50-022	*Hopwood*	Mobile 3	20.48	20.62	9	1845.66	1842.00	3.7	27,300	9,000	5	20.0%	4 to 5	59
5	211-22-002B	McKeag	House	22.86	22.95	14	1968.29	1965.25	3.0	24,400	8,000	5	20.0%	5	76
847	202-21-169	Hines	House	23.13	23.25	19	1984.20	1980.93	3.3	24,400	8,000	5	20.0%	4	52
62	211-50-022	Hopwood	Mobile 2	20.48	20.62	7	1843.80	1842.00	1.8	27,300	11,700	8	12.5%	4 to 5	29
84	211-50-016J	Harper	Mobile 1	20.38	20.48	6	1840.58	1838.40	2.2	27,300	13,000	11	9.1%	5 to 6	54
104	211-50-037C	Mathis	Mobile	20.26	20.38	1	1830.65	1829.20	1.5	27,300	13,600	12	8.3%	5 to 6	36
84	211-50-016J	Harper	Mobile 3	20.38	20.48	4	1839.39	1837.30	2.1	27,300	13,500	12	8.3%	5 to 6	52
84	211-50-016J	Harper	Mobile 2	20.38	20.48	5	1839.39	1837.60	1.8	27,300	14,250	13	7.7%	5 to 6	45
616	202-21-024B	Albert	House	22.86	22.95	16	1973.36	1971.42	1.9	24,400	12,200	13	7.7%	4 to 5	31
62	211-50-022	Hopwood	Mobile 1	20.48	20.62	10	1847.62	1846.00	1.6	27,300	15,000	15	6.7%	4 to 5	26
6	211-22-002J	Geraci	Mobile	22.86	22.95	12	1965.40	1964.00	1.4	24,400	13,500	16	6.3%	5	35
104	211-50-037C	Mathis	House	20.26	20.38	3	1833.30	1832.54	0.8	27,300	19,600	31	3.2%	5 to 6	19
585	202-21-013R	Eller	House	22.95	23.13	18	1980.24	1979.29	1.0	24,400	18,000	34	2.9%	4	15
634	202-21-031C	Selleys Charles T Tr	House	CL .327	CL .403	28	2024.80	2024[3]	0.8	16,700	10,600	40	2.5%	6 to 7	34
584	202-21-013M	Funk Donna M;Proulx Bradley E	House	23.33	23.45	21	1997.41	1996.58	0.8	24,400	19,000	42	2.4%	3 to 7	21
929	211-50-016H	Birdsell Carl C; Russell L; Lois	Mobile	20.38	20.45	---	1837.22	1837[3]	0.2	27,300	25,000	71	1.4%	5 to 6	5
62	211-50-022	Hopwood	House 2	20.48	20.62	---	1845.66[1]	1845.48	0.2	27,300	25,000	71	1.4%	4 to 5	3
647	202-21-032A	Caldwell David L;Carol A	House	CL .247	CL .327	26	2021.74	2021.44	0.3	16,700	13,300	91	1.1%	2 to 6	5
62	211-50-022	Hopwood	House 1	20.48	20.62	8	1844.89	1844.87	0.0	27,300	27,300	100	1.0%	4 to 5	1
148	203-32-006	Parks	Mobile	19.62	19.72	---	n/a	n/a	n/a	27,300	---	---	---	---	0
41	211-50-015A	Gellerman	House	20.64	20.71	11	1853.22	1855.30	-2.1	27,300	---	---	---	4 to 5	0
854	202-21-176	*Bierbaum Leon D;Ronda Y*	Mobile	23.33	23.45	---	1995.88	1998.00	-2.1	24,400	---	---	---	3 to 7	0
639	202-21-031Q	Sartain James P;Wanda A	House 1	23.64	23.87	23	2016.49	2017.10	-0.6	11,800	---	---	---	3 to 4	0
540	202-16-012L	Pirri Anthony J;Margaret L	House	25.83	25.95	24	2116.06	2118.05	-2.0	7,800	---	---	---	3	0
847	202-21-169	Hines	Garage	23.13	23.25	20	1984.20	1980.53	3.7	24,400	6,600	4	25.0%	4	59
616	202-21-024B	Albert	Garage	22.95	23.13	17	1974.27	1971.41	2.9	24,400	7,400	5	20.0%	4 to 5	46
5	211-22-002B	McKeag	Garage	22.86	22.95	13	1967.00	1964.01	3.0	24,400	8,600	6	16.7%	5	75
104	211-50-037C	Mathis	Building	20.26	20.38	2	1832.22	1830.92	1.3	27,300	14,200	13	7.7%	5 to 6	32
615	202-21-024A	Lund Wayne E	Slab	22.86	22.95	15	1971.04	1969.10	1.9	24,400	13,800	17	5.9%	5	49
584	202-21-013M	Funk Donna M;Proulx Bradley E	Garage	23.45	23.55	22	1999.19	1998.27	0.9	24,400	19,400	45	2.2%	7	45
540	202-16-012L	Pirri Anthony J;Margaret L	Building	25.83	25.95	25	2116.39	2117.97	-1.6	7,800	---	---	---	3	0
579	202-21-008T	Kraus Investments L C	Mobile	24.03	24.12	---	2026.41	2024[3]	2.4	11,800	4,400	6	16.7%	4 to 6	22
826	202-21-150	Parry Michael K;Debra T	Mobile	24.48	24.61	---	2046.44	2045[3]	1.4	9,700	5,000	13	7.7%	4 to 7	13
819	202-21-145	Barnes J R;Carol J	House	24.87	24.95	---	2064.11	2064[3]	0.1	7,800	7,400	63	1.6%	2	1
647	202-21-032A	Caldwell David L;Carol A	Building	CL .247	CL .327	27	2020.17	2019.27	0.9	16,700	---	---	---	2 to 6	14

WSEL interpolated

[1] WSEL set to match neighboring structure

[2] Finished Floor elevation for houses; Adjacent ground elevation for mobile homes

[3] Property was not surveyed; this elevation was estimated from topo (Barnes house = EGE+12")

n/a = Residence is outside the floodplain

Appendix F

Ranking Matrix Tables for Residences in 100-year Floodway and Severe Erosion Hazard Zone

APPENDIX F, TABLE F-1
SKUNK CREEK WATERCOURSE MASTER PLAN, PHASE 2
Ranking Matrix for Residences in 100-year Floodway and Severe Erosion Hazard Zone
Based on Probability of Flooding

Erosion Hazard Zone	Percent chance of floodwater entering home in any given year[1]			
	1-2 (100yr-50yr)	2-4(50yr-25yr)	4-10 (25yr-10yr)	10-50 (10yr-2yr)
Long-Term	647(26)[2]	634(28)	84(4M,5M,6M)	62(9M)
Lateral Migration	639(23), 647(27B?)	104(3), 585(18)	104(1M,2B)	62(7M)
Severe	62(8),929(32M)	584(21,22G)	62(10M), 6(12M), 616(16), 826(34M)	5(13G,14), 616(17G), 847(19,20G), 579(33M)

Legend:

	Signifies low hazard potential.
	Signifies moderate hazard potential.
	Signifies high hazard potential.
	Signifies very high hazard potential.
	Signifies severe hazard potential.

[1] Estimated using the finished floor elevation for site-built homes, and the elevation of the ground under the home for mobile homes.

[2] 647 is the TAG Number; Numbers in parentheses are the Field Survey Cross Section Numbers, M is for Mobile Home, G is for Garage, B is for Building, no letter signifies a site-built house.

APPENDIX F, TABLE F-2
SKUNK CREEK WATERCOURSE MASTER PLAN, PHASE 2
Ranking Matrix for Residences in 100-year Floodway and Severe Erosion Hazard Zone
Based on 100-year Flow Depth

Erosion Hazard Zone	Depth of flow in structure during 100-year flood in feet[1]			
	0-1	1-2	2-3	3-4
Long-Term	647(26), 634(28)	84(5M)	84(4M,6M)[2]	62(9M)
Lateral Migration	104(3), 62(7M), 585(18), 639(23), 647(27B)	104(1M,2B)		
Severe	62(8), 584(21,22G), 929(32M)	62(10M), 6(12M), 615(15MP), 826(34M)	616(16,17G), 579(33M)	5(13G,14), 847(19,20G)

Legend:

	Signifies low hazard potential.
	Signifies moderate hazard potential.
	Signifies high hazard potential.
	Signifies very high hazard potential.
	Signifies severe hazard potential.

[1] Estimated using the finished floor elevation for site-built homes, and the elevation of the ground under the home for mobile homes.

[2] 84 is the TAG Number; Numbers in parentheses are the Field Survey Cross Section Numbers, M is for Mobile Home, G is for Garage, B is for Building, no letter signifies a site-built house.

Appendix G

Results Summaries from Individual Meetings with Property Owners (including handout materials)

SKUNK CREEK WATERCOURSE MASTER PLAN
INDIVIDUAL MEETING SUMMARIES

Parcel 202-21-013R

Home Owner: Jeannie Eller
Meeting Date: March 8, 2001
Meeting Location: 42828 N. 7th Avenue, New River, AZ

In Attendance:

Ms. Jeannie Eller
A friend of Ms. Eller, name unknown
Ms. Marilyn DeRosa, FCDMC
Mrs. Shanna Yeager, FCDMC
Mr. Tom Loomis, Tetra Tech, Inc.

Handout Materials:

1. Floodplain Status Information Sheet. This 1-page sheet lists information about structures on the property in question. It includes:

   - The FEMA 100-year peak discharge and estimated water surface elevation at each structure.
   - The finished floor elevation of the structure.
   - The estimated depth of water above the finished floor during a 100-year flood.
   - The estimated flow rate in Skunk Creek where the floor first begins to be flooded (for mobile homes, the flow rate required to start flooding the ground under the mobile).
   - The approximate flood return interval for the flow rate required to reach the finished floor elevation, or the ground beneath mobile homes. The return interval is in relation to a flood frequency curve for the USGS Flow Gage at the Skunk Creek crossing of Interstate 17, and is not site-specific.
   - Whether or not the structure is within the FEMA 100-year Floodway.
   - Which Erosion Hazard Zone the structure is within.
   - A written description of what the findings mean.

2. A 200-scale color aerial photograph of Ms. Eller's property and adjacent parcels. The FEMA 100-year Floodplain and Floodway are shown as blue and red lines, respectively. The Erosion Hazard Zones defined under the WCMP are shown as areas shaded in red (severe zone), yellow (lateral migration zone), and green (long-term zone). The elevation of the finished floor of Ms. Eller's house is shown (based on a field survey), as well as the FEMA 100-year water surface elevation at her house.

3. A 200-scale cross section of Skunk Creek taken through each structure listed on the Floodplain Status Information Sheet. The profile of the ground using the topography from the 1997 flood insurance study of Skunk Creek is shown, as well as the location of the structure and its finished floor elevation, the limits of the FEMA 100-year Floodway, and the FEMA 100-year water surface elevation.

4. A table listing of peak flow data for Skunk Creek at the USGS Flow Gage at the Skunk Creek crossing of Interstate 17, including approximate return frequencies.

5. A copy of the Maricopa County Floodplain Regulations.

Meeting Results:

Marilyn opened by presenting the goals of the Skunk Creek Watercourse Master Plan (WCMP) and informing Ms. Eller that her home on Assessor's Parcel 202-21-013R is located entirely within the FEMA 100-year Floodway. Marilyn expressed that the purpose of this meeting was informational, intended to inform Ms. Eller of the flood and erosion hazards present on the property where she resides. These hazards have been identified during the WCMP preparation and warrant an individual meeting to describe the findings. Marilyn thanked Ms. Eller for taking the time to meet with us.

Tom explained the basics of the Federal Emergency Management Agency (FEMA) National Flood Insurance Program and the differences between the 100-year floodplain and floodway. The concept of a 100-year flood being a flood that has 1% chance of occurring in any given year was explained. The 100-year floodplain was defined as the area subject to being covered by floodwater during a 1% flood. The 100-year floodway was described as a regulatory area reserved for the flow of waters, and as a very hazardous, life-threatening area because of the high depth and velocity of flow. The concept of "squeezing in" the floodplain limits to the floodway limits was described, as was the effects of such floodplain encroachments on velocity, peak discharge and downstream improvements.

The presentation materials were used as examples specific to Ms. Eller's property. Ms. Eller said she was familiar with the basics of the FEMA flood insurance program from having applied for a building permit and receiving a denial because she was in the floodway. Next, Tom described the Erosion Hazard Zones that were prepared as part of the WCMP. The severe erosion hazard zone was described as the area subject to erosion during a large flood, such as the 1% flood. The lateral migration erosion hazard zone was described as the area subject to erosion from a typical series of floods over a 60-year period, including the erosion resulting from a large flood, such as the 1% flood. Tom spent time describing the potential for movement of the main channel of Skunk Creek back and forth across the floodplain using the cross section handout and the plan view. Tom explained that the geomorphology study results show that the main channel of Skunk Creek has moved as much as 400 feet in some areas within the last 60-years. The long-term erosion hazard zone was described as the area expected to be subject to erosion over a much longer period of time, from 60- to 1,000-years. It is the area that geologic evidence shows Skunk Creek has occupied in the past 60- to 1000-years.

Tom then described the three alternatives that are being analyzed as a part of the WCMP. The full-structural alternative was described as implementation of the existing regulations. If encroachment is allowed to continue to occur, then levees and bank protection will be necessary to protect the improvements made within the floodplain. It was explained that this option is very expensive to the public, and that it results in increases in peak discharge downstream because of the loss of over bank storage and increases in flow depths and velocity. The effects of this alternative on Ms. Eller's home were explained. Implementation would result in increased flow depths and velocity through her home, and difficulty of access across the levees. It was explained that if this alternative were selected, her property would probably be recommended for a mandatory buy-out program because her home would lie inside the levees. Building levees around her home would constrict the wash too much and is infeasible.

The nonstructural alternative was described as not allowing any encroachment within the 100-year floodplain or the long-term erosion hazard zone. This is the maximum area the wash needs to function naturally. Implementation would require buying property that is outside the 100-year floodplain and the lateral migration erosion hazard zone. The homes that are in the floodway would possibly be included in a voluntary buy-out program. The impact on Ms. Eller's

property is that the entire parcel would be restricted from future building, but that she could continue to live there if she chooses.

The low-impact structural alternative was described as limiting floodplain encroachment to the lateral migration erosion hazard zone boundary. This is the minimum area the wash needs to function naturally. This alternative results in minimal increases in flow depth and velocity and can be implemented without the construction of levees in most areas. Almost all of her property is within this zone; therefore, the impact on her property would be that no building would be allowed in this zone. The possibility of a voluntary buyout program for her property was presented as one possible implementation option. When asked how Ms. Eller felt about such a program, she was interested, but concerned about the amount of compensation that would be offered. She explained that she had bought this property many years ago with the goal of using it to fund her retirement, which is 2 to 3 years away. Now, she can't build on it or sell it to someone else to build on it. This puts her in a very detrimental position. Marilyn explained that the buy-out program is voluntary, and that she could still live here if she chooses. The buy-out would be based on a fair market value appraisal plus an additional relocation expense allowance. Marilyn also made it clear that a buy-out program would have to receive the approval of the Maricopa County Board of Supervisors and that, if approved, would take time to implement, possibly years because of funding constraints. She explained that this has been previously done by the Flood Control District for homes built within the floodway of New River. Ms. Eller expressed great concern about the entire process and that she is very upset about the position she has found herself in. She would be in favor of the voluntary buy-out program if the price were fair.

Ms. Eller asked why she couldn't add on to her home. Shanna explained that she can, but the value of the addition cannot exceed 50% of the appraised value of the home at the time of the addition. Also, the 50% value at the time of the first addition is the total amount that can be spent on any additions, then or in the future. Shanna also explained that if the home burns down, or some other similar catastrophe happens, it couldn't be rebuilt.

Marilyn explained that a flood warning system for existing homes in the area was being considered. The meeting lasted about 1½ hours.

Skunk Creek Watercourse Master Plan, Phase II

Floodplain Status Information Sheet

Parcel Number: 202-21-013R
Owner: Eller
Address: 42828 N. 7th Ave.
New River, AZ 85087
Phone: (623) 465-0194

Project Tag ID # 585

Structure	House		
Cross Section #	18		
Approximate River Mile	23.12		
Existing Condition 100-yr Flow [cfs]	24,400		
Existing Condition 100-yr Water Surface Elevation [ft]	1980.2		
Finished Floor Elevation (FFE) [ft]	1979.3		
Depth of Water Above Finished Floor [ft]	0.9		
Flow Required to Reach FFE [cfs] (for mobile homes, flow required to reach ground underneath home)	18,000		
Approx. Storm Return Interval Required to Reach FFE (or ground beneath mobile homes)	56-yr		
Is Structure Within Floodway?	Yes		
Erosion Hazard Zone	Lateral Migration		

Summary of Findings

The house on this parcel is subject to flooding and is located within the FEMA 100-year floodway. During the 100-year flood, there would be approximately 11 inches of water in the house. Lower frequency storms would also cause flooding problems. The 56-year storm, which has approximately a 2% probability of occuring or being exceeded in any given year, would reach the finished floor elevation.

The house on this parcel is located within the Lateral Migration Erosion Hazard Zone. The danger of erosion in this zone is less than in the Severe Erosion Hazard Zone, but could occur at some point within the next 60 years.

US GEOLOGICAL SURVEY
SKUNK CREEK PEAK FLOW DATA

Station name: Skunk Creek Near Phoenix, Ariz.

Station number: 09513860

Location: On right bank dike of Skunk Creek flood control channel, 300 ft east of frontage road of Interstate Highway 17, 3 mi north of Adobe and 20 mi north of City Hall in Phoenix. Lat 33°43'45", Long 112°07'09", in NW1/4SE1/4SE1/4 sec.35, T.5 N., R.2 E., Maricopa County, Hydrologic Unit 15070102.

Water Years Retrieved: 1959 through 1999

Date	Discharge [cfs]	Approximate Return Frequency
---	---	
---	---	
---	---	
08/01/1964	11,500	23-yr
09/05/1970	9,650	18-yr
12/25/1959	9,400	17-yr
08/12/1990	8,160	14-yr
08/23/1992	7,020	11-yr
11/30/1982	6,170	10-yr
12/19/1967	5,900	
01/08/1993	4,990	
08/21/1971	4,770	
10/06/1972	4,700	
08/19/1970	4,460	
03/01/1978	3,590	
10/10/1986	3,440	
02/28/1978	3,380	
08/17/1971	3,260	
01/11/1993	3,160	
07/24/1990	3,110	
08/15/1990	2,900	
07/15/1999	2,620	
11/08/1982	2,570	
07/17/1972	2,380	
01/17/1978	2,340	
11/01/1987	2,250	
08/30/1988	2,200	
12/10/1982	2,180	
09/03/1990	2,090	
12/01/1982	1,730	
07/14/1999	1,690	
12/23/1982	1,460	
10/19/1972	1,420	
01/26/1985	1,320	
08/11/1991	1,250	
10/11/1986	1,250	
02/20/1980	1,210	
02/09/1993	1,170	
12/19/1991	1,140	
02/13/1978	1,080	
09/02/1967	950	
03/01/1991	939	
07/22/1986	906	
02/28/1991	844	

100-yr = 27,600 cfs

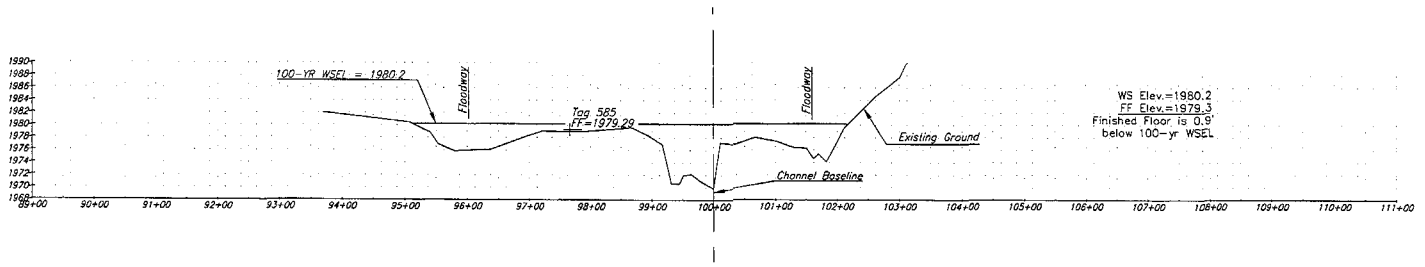
25-yr = 12,100 cfs

10-yr = 6,120 cfs

5-yr = 3,230 cfs

2-yr = 960 cfs

18
House



NO.	REVISIONS	DATE	BY	CHK.
XS585.DWG				

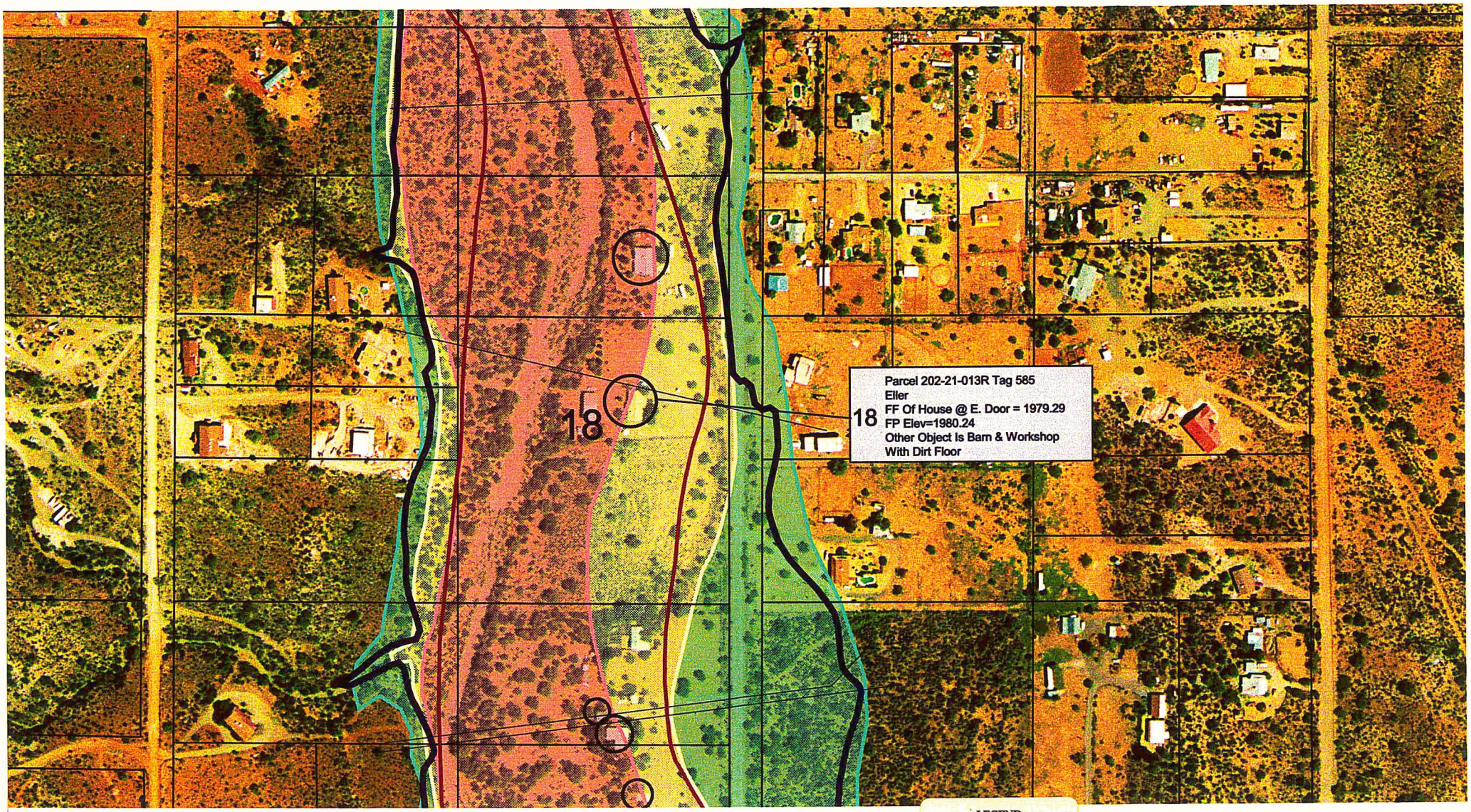
TETRA TECH, INC.
INFRASTRUCTURE SOUTHWEST GROUP
501 North 44th Street, Suite 125, Phoenix, AZ 85008
(602) 429-1100 FAX (602) 429-1186

SKUNK CREEK PHASE II
WATERCOURSE MASTER PLAN

JOB NO.	2350.0002
DESIGNED BY:	LML
DRAWN BY:	LML
CHECKED BY:	TRL
APPROVED BY:	TRL
DATE:	

STRUCTURE CROSS SECTIONS
Owner: ELLER
Cross Section: 18

SCALE: HORIZ: 1"= 200'
CONT. INTERVAL =
DRAWING NO.
SHEET NO. OF:



AERIAL PHOTO DATE: 7/1999

LEGEND

- Severe Erosion Hazard Zone
- Lateral Migration Erosion Hazard Zone
- Long Term Erosion Hazard Zone
- Floodplain
- Floodway

N

Scale: 1"=200'

TETRA TECH, INC
INFRASTRUCTURE SOUTHWEST GROUP
501 North 44th Street, Suite 135, Phoenix, AZ 85008
(602) 620-1100 FAX (602) 620-1108

Parcel 202-21-169

Home Owner: Joe and Claudia Hines
Meeting Date: March 8, 2001
Meeting Location: 43012 N. 7th Avenue, New River, AZ

In Attendance:

Mr. Joe Hines
Mrs. Claudia Hines
Ms. Marilyn DeRosa, FCDMC
Mrs. Shanna Yeager, FCDMC
Mr. Tom Loomis, Tetra Tech, Inc.

Handout Materials:

1. Floodplain Status Information Sheet. This 1-page sheet lists information about structures on the property in question. It includes:

   - The FEMA 100-year peak discharge and estimated water surface elevation at each structure.
   - The finished floor elevation of the structure.
   - The estimated depth of water above the finished floor during a 100-year flood.
   - The estimated flow rate in Skunk Creek where the floor first begins to be flooded (for mobile homes, the flow rate required to start flooding the ground under the mobile).
   - The approximate flood return interval for the flow rate required to reach the finished floor elevation, or the ground beneath mobile homes. The return interval is in relation to a flood frequency curve for the USGS Flow Gage at the Skunk Creek crossing of Interstate 17, and is not site-specific.
   - Whether or not the structure is within the FEMA 100-year Floodway.
   - Which Erosion Hazard Zone the structure is within.
   - A written description of what the findings mean.

2. A 200-scale color aerial photograph of the Hines's property and adjacent parcels. The FEMA 100-year Floodplain and Floodway are shown as blue and red lines, respectively. The Erosion Hazard Zones defined under the WCMP are shown as areas shaded in red (severe zone), yellow (lateral migration zone), and green (long-term zone). The elevation of the finished floor of the Hines's house is shown (based on a field survey), as well as the FEMA 100-year water surface elevation at their house.

3. A 200-scale cross section of Skunk Creek taken through each structure listed on the Floodplain Status Information Sheet. The profile of the ground using the topography from the 1997 flood insurance study of Skunk Creek is shown, as well as the location of the structure and its finished floor elevation, the limits of the FEMA 100-year Floodway, and the FEMA 100-year water surface elevation.

4. A table listing of peak flow data for Skunk Creek at the USGS Flow Gage at the Skunk Creek crossing of Interstate 17, including approximate return frequencies.

5. A copy of the Maricopa County Floodplain Regulations.

Meeting Results:

Marilyn opened by presenting the goals of the Skunk Creek Watercourse Master Plan (WCMP) and informing the Hines's that their home on Assessor's Parcel 202-21-169 is located entirely within the FEMA 100-year Floodway, and within the severe erosion hazard zone. Marilyn expressed that the purpose of this meeting was informational, intended to inform the Hines's of the flood and erosion hazards present on the property where they reside. These hazards have been identified during the WCMP preparation and warrant an individual meeting to describe the findings. Marilyn thanked the Hines's for taking the time to meet with us.

Tom explained the basics of the Federal Emergency Management Agency (FEMA) National Flood Insurance Program and the differences between the 100-year floodplain and floodway. The concept of a 100-year flood being a flood that has 1% chance of occurring in any given year was explained. The 100-year floodplain was defined as the area subject to being covered by floodwater during a 1% flood. The 100-year floodway was described as a regulatory area reserved for the flow of waters, and as a very hazardous, life-threatening area because of the high depth and velocity of flow. The concept of "squeezing in" the floodplain limits to the floodway limits was described, as was the effects of such floodplain encroachments on velocity, peak discharge and downstream improvements.

The presentation materials were used as examples specific to the Hines's property. Next, Tom described the Erosion Hazard Zones that were prepared as part of the WCMP. The severe erosion hazard zone was described as the area subject to erosion during a large flood, such as the 1% flood. The lateral migration erosion hazard zone was described as the area subject to erosion from a typical series of floods over a 60-year period, including the erosion resulting from a large flood, such as the 1% flood. Tom spent time describing the potential for movement of the main channel of Skunk Creek back and forth across the floodplain using the cross section handout and the plan view. Tom explained that the geomorphology study results show that the main channel of Skunk Creek has moved as much as 400 feet in some areas within the last 60-years. The long-term erosion hazard zone was described as the area expected to be subject to erosion over a much longer period of time, from 60- to 1,000-years. It is the area that geologic evidence shows Skunk Creek has occupied in the past 60- to 1000-years.

Tom then described the three alternatives that are being analyzed as a part of the WCMP. The full-structural alternative was described as implementation of the existing regulations. If encroachment is allowed to continue to occur, then levees and bank protection will be necessary to protect the improvements made within the floodplain. It was explained that this option is very expensive to the public, and that it results in increases in peak discharge downstream because of the loss of over bank storage and increases in flow depths and velocity. The effects of this alternative on the Hines's home were explained. Implementation would result in increased flow depths and velocity through their home, and difficulty of access across the levees. It was explained that if this alternative were selected, their property would probably be recommended for a mandatory buy-out program because the home would lie inside the levees. Building levees around their home would constrict the wash too much and is infeasible.

The nonstructural alternative was described as not allowing any encroachment within the 100-year floodplain or the long-term erosion hazard zone. This is the maximum area the wash needs to function naturally. Implementation would require buying property that is outside the 100-year floodplain and the lateral migration erosion hazard zone. The homes that are in the floodway, especially those within the severe erosion hazard zone, would possibly be included in a voluntary buy-out program. The impact on the Hines's property is that the entire parcel would be restricted from future building, but that they could continue to live there if they choose.

The low-impact structural alternative was described as limiting floodplain encroachment to the lateral migration erosion hazard zone boundary. This is the minimum area the wash needs to function naturally. This alternative results in minimal increases in flow depth and velocity and can be implemented without the construction of levees in most areas. Almost all of their property is within this zone; therefore, the impact on the Hines's property would be that no building would be allowed in this zone. The possibility of a voluntary buyout program for their property was presented as one possible implementation option. When asked how the Hines's felt about such a program, there was considerable discussion. Mrs. Hines was not convinced there is really a safety problem. She stated that they have never had water from the creek overtop the bank in the 30 plus years they have resided on the property. Mr. Hines said he felt we were presenting the facts as we understood them, but he was concerned that the erosion hazard lines were not accurate. Mr. Hines said that Cline Creek comes into Skunk Creek just upstream of his property, and that it pushes Skunk Creek over to the west bank. Therefore, he asked why the erosion line pushed so far to the east. Tom explained that Cline Creek joins Skunk Creek over ½ mile upstream and that it in fact does push Skunk Creek to the west. However, the Skunk Creek main channel pushes back to the east at his property. There is also the potential for the main Skunk Creek channel to move to the east during a single major flood because of a breakout area on the east bank upstream of the Hines's property. Mr. Hines voiced his opinion that vegetation in the wash bottom and on the west bank was causing Skunk Creek to erode the east bank next to his house. He would like to see that vegetation removed. Tom explained that removal of the native vegetation hurts the situation more than it helps. The vegetation is what helps slow down the natural erosion processes. Removing it can accelerate the process and make things worse for him.

The Hines's ended up being interested in the possible buy-out program, but were concerned about the amount of compensation that would be offered. Marilyn explained that the buy-out program is voluntary, and that they could still live here if they choose. The buy-out would be based on a fair market value appraisal plus an additional relocation expense allowance. Marilyn also made it clear that a buy-out program would have to receive the approval of the Maricopa County Board of Supervisors and that, if approved, would take time to implement, possibly years because of funding constraints. She explained that this has been previously done by the Flood Control District for homes built within the floodway of New River.

There was discussion about building permits for homes in the floodway. Shanna explained that additions to existing homes can be made, but the addition must be a part of the existing structure. The addition cannot exceed 50% of the appraised value of the home at the time of the addition. Also, the 50% value at the time of the first addition is the total amount that can be spent on any additions, then or in the future. Shanna also explained that if the home burns down, or some other similar catastrophe happens, it couldn't be rebuilt.

Marilyn explained that a flood warning system for existing homes in the area was being considered. The meeting lasted about 1½ hours.

Floodplain Status Information Sheet

Parcel Number: 202-21-169
Owner: Hines
Address: 43012 N. 7th Ave.
New River, AZ 85087
Phone: (623) 465-7200

Project Tag ID # 847

Structure	House	Garage	
Cross Section #	19	20	
Approximate River Mile	23.20	23.20	
Existing Condition 100-yr Flow [cfs]	24,400	24,400	
Existing Condition 100-yr Water Surface Elevation [ft]	1984.2	1984.2	
Finished Floor Elevation (FFE) [ft]	1980.9	1980.5	
Depth of Water Above Finished Floor [ft]	3.3	3.7	
Flow Required to Reach FFE [cfs] (for mobile homes, flow required to reach ground underneath home)	8,000	6,600	
Approx. Storm Return Interval Required to Reach FFE (or ground beneath mobile homes)	17-yr	13-yr	
Is Structure Within Floodway?	Yes	Yes	
Erosion Hazard Zone	Severe	Severe	

Summary of Findings

Both structures on this parcel are subject to flooding and are located within the FEMA 100 year floodway. During the 100-year flood, there would be approximately 3' 4" of water in the house. Lower frequency storms would also cause flooding problems. For the house, the 17-year storm, which has approximately a 6% probability of occuring or being exceeded in any given year, would reach the finished floor elevation.

Both structures are located within the Severe Erosion Hazard Zone. This zone is comprised of the active watercourse channels and adjacent areas likely to be eroded during a single major event, such as the 100-year flood.

US GEOLOGICAL SURVEY
SKUNK CREEK PEAK FLOW DATA

Station name: Skunk Creek Near Phoenix, Ariz.

Station number: 09513860

Location: On right bank dike of Skunk Creek flood control channel, 300 ft east of frontage road of Interstate Highway 17, 3 mi north of Adobe and 20 mi north of City Hall in Phoenix. Lat 33°43'45", Long 112°07'09", in NW1/4SE1/4SE1/4 sec.35, T.5 N., R.2 E., Maricopa County, Hydrologic Unit 15070102.

Water Years Retrieved: 1959 through 1999

Date	Discharge [cfs]	Approximate Return Frequency
---	---	
---	---	
---	---	
08/01/1964	11,500	23-yr
09/05/1970	9,650	18-yr
12/25/1959	9,400	17-yr
08/12/1990	8,160	14-yr
08/23/1992	7,020	11-yr
11/30/1982	6,170	10-yr
12/19/1967	5,900	
01/08/1993	4,990	
08/21/1971	4,770	
10/06/1972	4,700	
08/19/1970	4,460	
03/01/1978	3,590	
10/10/1986	3,440	
02/28/1978	3,380	
08/17/1971	3,260	
01/11/1993	3,160	
07/24/1990	3,110	
08/15/1990	2,900	
07/15/1999	2,620	
11/08/1982	2,570	
07/17/1972	2,380	
01/17/1978	2,340	
11/01/1987	2,250	
08/30/1988	2,200	
12/10/1982	2,180	
09/03/1990	2,090	
12/01/1982	1,730	
07/14/1999	1,690	
12/23/1982	1,460	
10/19/1972	1,420	
01/26/1985	1,320	
08/11/1991	1,250	
10/11/1986	1,250	
02/20/1980	1,210	
02/09/1993	1,170	
12/19/1991	1,140	
02/13/1978	1,080	
09/02/1967	950	
03/01/1991	939	
07/22/1986	906	
02/28/1991	844	

100-yr = 27,600 cfs

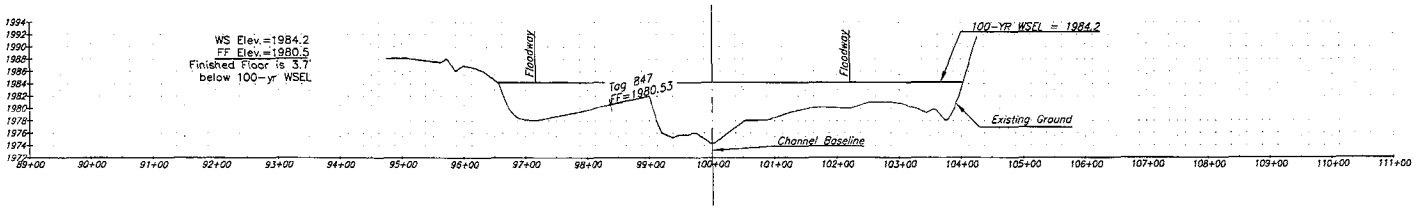
25-yr = 12,100 cfs

10-yr = 6,120 cfs

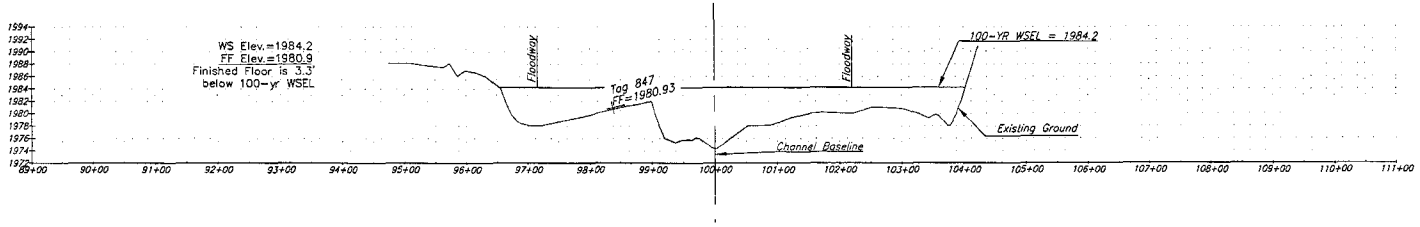
5-yr = 3,230 cfs

2-yr = 960 cfs

20
Garage



19
House



NO.	REVISIONS	DATE	BY	CHK.

XS847.DWG

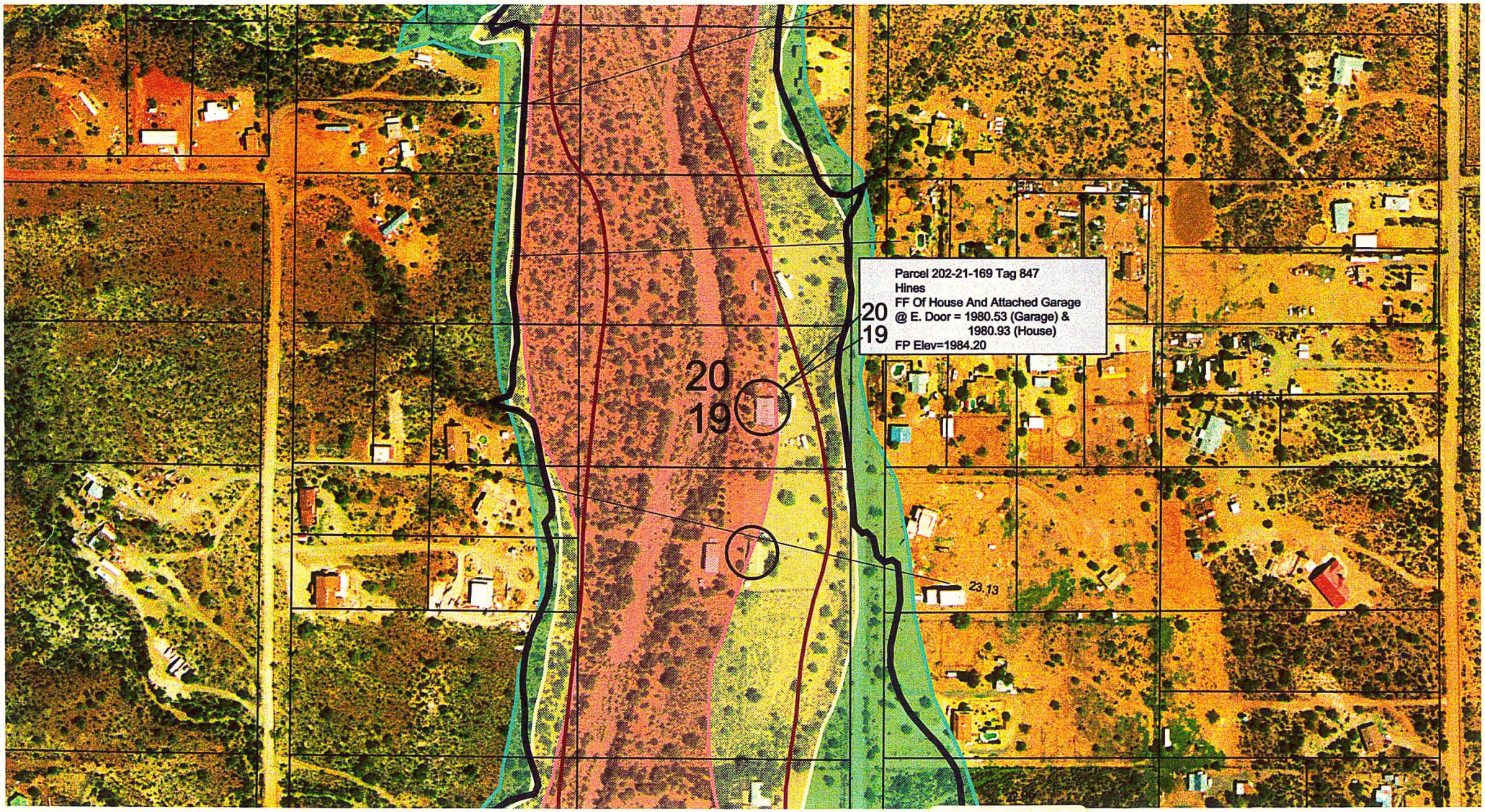
TETRA TECH, INC.
INFRASTRUCTURE SOUTHWEST GROUP
501 North 44th Street, Suite 125, Phoenix, AZ 85008
(602) 629-1100 FAX (602) 629-1186

SKUNK CREEK PHASE II
WATERCOURSE MASTER PLAN

JOB NO.	2350.0002
DESIGNED BY:	LML
DRAWN BY:	LML
CHECKED BY:	TRL
APPROVED BY:	TRL
DATE:	

STRUCTURE CROSS SECTIONS
Owner: HINES
Cross Sections: 19, 20

SCALE: HORIZ: 1" = 200'
CONT. INTERVAL =
DRAWING NO.
SHEET NO. OF:



AERIAL PHOTO DATE: 7/1999

LEGEND

- Severe Erosion Hazard Zone
- Lateral Migration Erosion Hazard Zone
- Long Term Erosion Hazard Zone
- Floodplain
- Floodway

N

Scale: 1"=200'

TETRA TECH, INC
INFRASTRUCTURE SOUTHWEST GROUP
501 North 44th Street, Suite 135, Phoenix, AZ 85008
(602) 625-1100 FAX (602) 625-1155

Parcel 211-50-037C

Home Owner: Tim and Tammy Mathis
Meeting Date: March 8, 2001
Meeting Location: 38640 N. 17th Avenue, New River, AZ

In Attendance:

Mr. Tim Mathis
Mrs. Tammy Mathis
Mrs. Mathis's mother and father
Ms. Marilyn DeRosa, FCDMC
Mrs. Shanna Yeager, FCDMC
Mr. Tom Loomis, Tetra Tech, Inc.

Handout Materials:

1. Floodplain Status Information Sheet. This 1-page sheet lists information about structures on the property in question. It includes:

    - The FEMA 100-year peak discharge and estimated water surface elevation at each structure.
    - The finished floor elevation of the structure.
    - The estimated depth of water above the finished floor during a 100-year flood.
    - The estimated flow rate in Skunk Creek where the floor first begins to be flooded (for mobile homes, the flow rate required to start flooding the ground under the mobile).
    - The approximate flood return interval for the flow rate required to reach the finished floor elevation, or the ground beneath mobile homes. The return interval is in relation to a flood frequency curve for the USGS Flow Gage at the Skunk Creek crossing of Interstate 17, and is not site-specific.
    - Whether or not the structure is within the FEMA 100-year Floodway.
    - Which Erosion Hazard Zone the structure is within.
    - A written description of what the findings mean.

2. A 200-scale color aerial photograph of the Mathis's property and adjacent parcels. The FEMA 100-year Floodplain and Floodway are shown as blue and red lines, respectively. The Erosion Hazard Zones defined under the WCMP are shown as areas shaded in red (severe zone), yellow (lateral migration zone), and green (long-term zone). The elevation of the finished floor of the Mathis's house is shown (based on a field survey), as well as the FEMA 100-year water surface elevation at their house.

3. A 200-scale cross section of Skunk Creek taken through each structure listed on the Floodplain Status Information Sheet. The profile of the ground using the topography from the 1997 flood insurance study of Skunk Creek is shown, as well as the location of the structure and its finished floor elevation, the limits of the FEMA 100-year Floodway, and the FEMA 100-year water surface elevation.

4. A table listing of peak flow data for Skunk Creek at the USGS Flow Gage at the Skunk Creek crossing of Interstate 17, including approximate return frequencies.

5. A copy of the Maricopa County Floodplain Regulations.

Meeting Results:

Marilyn opened by presenting the goals of the Skunk Creek Watercourse Master Plan (WCMP) and informing the Mathis's that their home on Assessor's Parcel 211-50-037C is located entirely within the FEMA 100-year Floodway. Marilyn expressed that the purpose of this meeting was informational, intended to inform the Mr. and Mrs. Mathis of the flood and erosion hazards present on the property where they reside. These hazards have been identified during the WCMP preparation and warrant an individual meeting to describe the findings. Marilyn thanked the Mathis's for taking the time to meet with us.

Tom explained the basics of the Federal Emergency Management Agency (FEMA) National Flood Insurance Program and the differences between the 100-year floodplain and floodway. The concept of a 100-year flood being a flood that has 1% chance of occurring in any given year was explained. The 100-year floodplain was defined as the area subject to being covered by floodwater during a 1% flood. The 100-year floodway was described as a regulatory area reserved for the flow of waters, and as a very hazardous, life-threatening area because of the high depth and velocity of flow. The concept of "squeezing in" the floodplain limits to the floodway limits was described, as was the effects of such floodplain encroachments on velocity, peak discharge and downstream improvements.

The presentation materials were used as examples specific to the Mathis's property. Next, Tom described the Erosion Hazard Zones that were prepared as part of the WCMP. The severe erosion hazard zone was described as the area subject to erosion during a large flood, such as the 1% flood. The lateral migration erosion hazard zone was described as the area subject to erosion from a typical series of floods over a 60-year period, including the erosion resulting from a large flood, such as the 1% flood. Tom spent time describing the potential for movement of the main channel of Skunk Creek back and forth across the floodplain using the cross section handout and the plan view. Tom explained that the geomorphology study results show that the main channel of Skunk Creek has moved as much as 400 feet in some areas within the last 60-years. The long-term erosion hazard zone was described as the area expected to be subject to erosion over a much longer period of time, from 60- to 1,000-years. It is the area that geologic evidence shows Skunk Creek has occupied in the past 60- to 1000-years.

Tom then described the three alternatives that are being analyzed as a part of the WCMP. The full-structural alternative was described as implementation of the existing regulations. If encroachment is allowed to continue to occur, then levees and bank protection will be necessary to protect the improvements made within the floodplain. It was explained that this option is very expensive to the public, and that it results in increases in peak discharge downstream because of the loss of over bank storage and increases in flow depths and velocity. The effects of this alternative on the Mathis's home were explained. Implementation would result in increased flow depths and velocity through their home, and difficulty of access across the levees. It was explained that if this alternative were selected, their property would probably be recommended for a mandatory buy-out program because the home would lie inside the levees. Building levees around their home would constrict the wash too much and is infeasible.

The nonstructural alternative was described as not allowing any encroachment within the 100-year floodplain or the long-term erosion hazard zone. This is the maximum area the wash needs to function naturally. Implementation would require buying property that is outside the 100-year floodplain and the lateral migration erosion hazard zone. The homes that are in the floodway, especially those within the severe erosion hazard zone, would possibly be included in a voluntary buy-out program. The impact on the Mathis's property is that the entire parcel would be restricted from future building, but that they could continue to live there if they choose.

The low-impact structural alternative was described as limiting floodplain encroachment to the lateral migration erosion hazard zone boundary. This is the minimum area the wash needs to function naturally. This alternative results in minimal increases in flow depth and velocity and can be implemented without the construction of levees in most areas. Some of their property is within this zone and outside the floodway; therefore, the impact on the Mathis's property would be that no building would be allowed in this zone. The possibility of a voluntary buyout program for their property was presented as one possible implementation option. When asked how the Mathis's felt about such a program, there was a very emotional discussion. The Mathis's understand there is a safety problem, but had hoped to be able to raise their children here.

The Mathis's ended up being interested in the possible buy-out program, but were concerned about the amount of compensation that would be offered. Marilyn explained that the buy-out program is voluntary, and that they could still live here if they choose. The buy-out would be based on a fair market value appraisal plus an additional relocation expense allowance. Marilyn also made it clear that a buy-out program would have to receive the approval of the Maricopa County Board of Supervisors and that, if approved, would take time to implement, possibly years because of funding constraints. She explained that this has been previously done by the Flood Control District for homes built within the floodway of New River.

Shanna explained that additions to existing homes can be made within a 100-year floodway, but the addition must be a part of the existing structure. The addition cannot exceed 50% of the appraised value of the home at the time of the addition. Also, the 50% value at the time of the first addition is the total amount that can be spent on any additions, then or in the future. Shanna also explained that if the home burns down, or some other similar catastrophe happens, it couldn't be rebuilt.

Marilyn explained that a flood warning system for existing homes in the area was being considered. The meeting lasted about 2 hours.

Skunk Creek Watercourse Master Plan, Phase II

Floodplain Status Information Sheet

Parcel Number: 211-50-037C
Owner: Mathis
Address: 38640 N. 17th Ave.
New River, AZ 85086
Phone: (623) 465-8731

Project Tag ID # 104

Structure	Mobile Home	Building	House
Cross Section #	1	2	3
Approximate River Mile	20.26	20.29	20.32
Existing Condition 100-yr Flow [cfs]	27,300	27,300	27,300
Existing Condition 100-yr Water Surface Elevation [ft]	1830.7	1832.2	1833.3
Finished Floor Elevation (FFE) [ft]	1831.5	1830.9	1832.5
Depth of Water Above Finished Floor [ft]	-0.8	1.3	0.8
Flow Required to Reach FFE [cfs] (for mobile homes, flow required to reach ground underneath home)	13,600	14,200	19,600
Approx. Storm Return Interval Required to Reach FFE (or ground beneath mobile homes)	29-yr	31-yr	53-yr
Is Structure Within Floodway?	Yes	Yes	Yes
Erosion Hazard Zone	Lateral Migration	Lateral Migration	Lateral Migration

Summary of Findings

All structures on this parcel are subject to flooding and are located within the FEMA 100-year floodway. During the 100-year flood, there would be approximately 10 inches of water in the house. Lower frequency storms would also cause flooding problems. For the house, the 53-year storm, which has approximately a 2% probability of occuring or being exceeded in any given year, would reach the finished floor elevation. For the mobile home, the floodwaters do not have to reach the finished floor elevation to pose a hazard to the structure. As soon as water flows underneath the home, there is a danger that the foundation piers could be undermined and subsequently fail. This condition occurs in a storm frequency as low as the 29-year storm, which has approximately a 3% probability of occuring or being exceeded in any given year.

All structures on this parcel are located within the Lateral Migration Erosion Hazard Zone. The danger of erosion in this zone is less than in the Severe Erosion Hazard Zone, but could occur at some point within the next 60 years.

US GEOLOGICAL SURVEY
SKUNK CREEK PEAK FLOW DATA

Station name: Skunk Creek Near Phoenix, Ariz.

Station number: 09513860

Location: On right bank dike of Skunk Creek flood control channel, 300 ft east of frontage road of Interstate Highway 17, 3 mi north of Adobe and 20 mi north of City Hall in Phoenix. Lat 33°43'45", Long 112°07'09", in NW1/4SE1/4SE1/4 sec.35, T.5 N., R.2 E., Maricopa County, Hydrologic Unit 15070102.

Water Years Retrieved: 1959 through 1999

Date	Discharge [cfs]	Approximate Return Frequency
---	---	
---	---	
---	---	
08/01/1964	11,500	23-yr
09/05/1970	9,650	18-yr
12/25/1959	9,400	17-yr
08/12/1990	8,160	14-yr
08/23/1992	7,020	11-yr
11/30/1982	6,170	10-yr
12/19/1967	5,900	
01/08/1993	4,990	
08/21/1971	4,770	
10/06/1972	4,700	
08/19/1970	4,460	
03/01/1978	3,590	
10/10/1986	3,440	
02/28/1978	3,380	
08/17/1971	3,260	
01/11/1993	3,160	
07/24/1990	3,110	
08/15/1990	2,900	
07/15/1999	2,620	
11/08/1982	2,570	
07/17/1972	2,380	
01/17/1978	2,340	
11/01/1987	2,250	
08/30/1988	2,200	
12/10/1982	2,180	
09/03/1990	2,090	
12/01/1982	1,730	
07/14/1999	1,690	
12/23/1982	1,460	
10/19/1972	1,420	
01/26/1985	1,320	
08/11/1991	1,250	
10/11/1986	1,250	
02/20/1980	1,210	
02/09/1993	1,170	
12/19/1991	1,140	
02/13/1978	1,080	
09/02/1967	950	
03/01/1991	939	
07/22/1986	906	
02/28/1991	844	

100-yr = 27,600 cfs

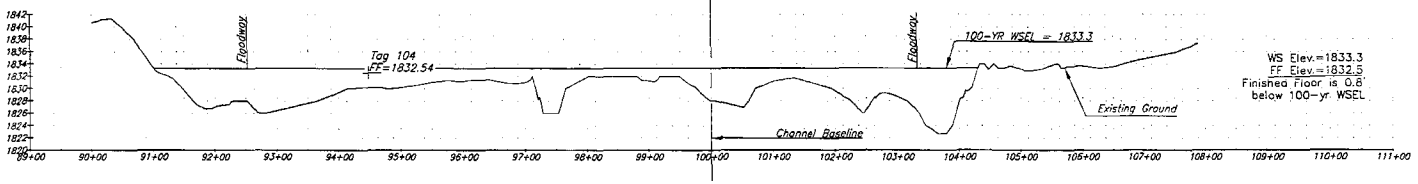
25-yr = 12,100 cfs

10-yr = 6,120 cfs

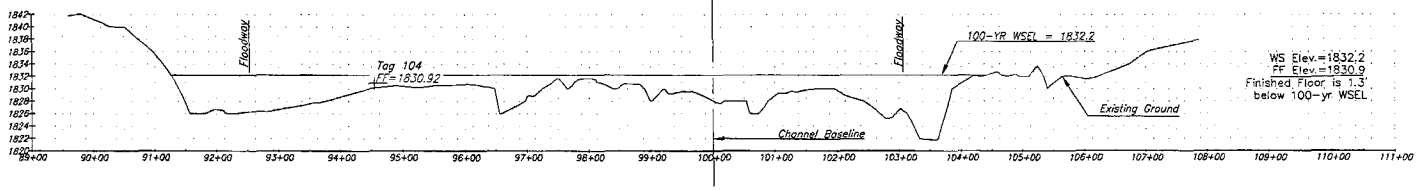
5-yr = 3,230 cfs

2-yr = 960 cfs

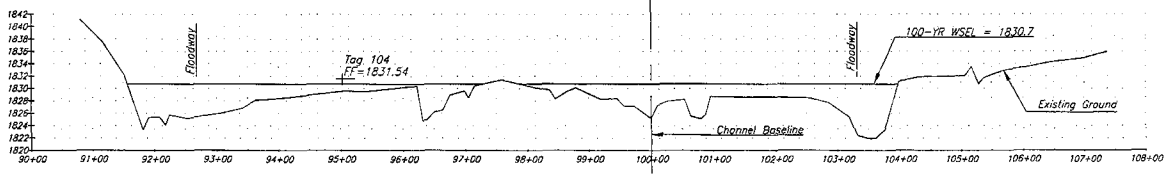
3
House



2
Building



1
Mobile Home



NO.	REVISIONS	DATE	BY	CHK.
XS104.DWG				

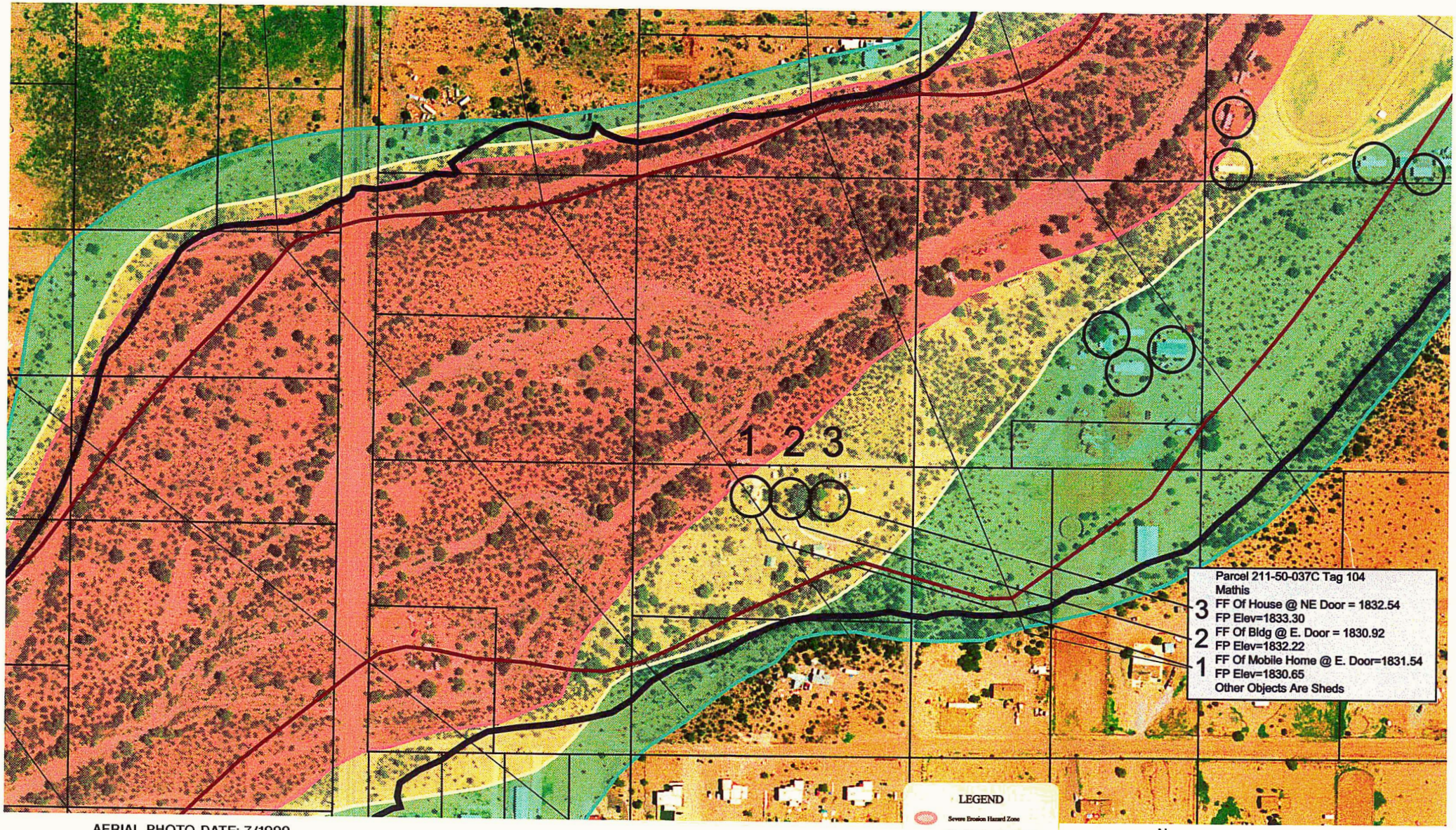
TETRA TECH, INC.
INFRASTRUCTURE SOUTHWEST GROUP
501 North 44th Street, Suite 125, Phoenix, AZ 85008
(602) 629-1100 FAX (602) 629-1186

SKUNK CREEK PHASE II
WATERCOURSE MASTER PLAN

JOB NO.	2350.0002
DESIGNED BY:	LML
DRAWN BY:	LML
CHECKED BY:	TRL
APPROVED BY:	TRL
DATE:	

STRUCTURE CROSS SECTIONS
Owner: MATHIS
Cross Sections: 1, 2, 3

SCALE: HORIZ: 1" = 200'
CONT. INTERVAL =
DRAWING NO.
SHEET NO. OF:



AERIAL PHOTO DATE: 7/1999

Scale: 1"=200'

TETRA TECH, INC
INFRASTRUCTURE SOUTHWEST GROUP
[illegible]

Parcel 202-21-024B

Home Owner: Dan and Kathleen Albert
Meeting Date: March 30, 2001
Meeting Location: 42745 N. 7th Avenue, New River, AZ

In Attendance:

Mr. Dan Albert
Mrs. Kathleen Albert
Ms. Marilyn DeRosa, FCDMC
Mrs. Shanna Yeager, FCDMC
Mr. Tom Loomis, Tetra Tech, Inc.

Handout Materials:

1. Floodplain Status Information Sheet. This 1-page sheet lists information about structures on the property in question. It includes:

   - The FEMA 100-year peak discharge and estimated water surface elevation at each structure.
   - The finished floor elevation of the structure.
   - The estimated depth of water above the finished floor during a 100-year flood.
   - The estimated flow rate in Skunk Creek where the floor first begins to be flooded (for mobile homes, the flow rate required to start flooding the ground under the mobile).
   - The approximate flood return interval for the flow rate required to reach the finished floor elevation, or the ground beneath mobile homes. The return interval is in relation to a flood frequency curve for the USGS Flow Gage at the Skunk Creek crossing of Interstate 17, and is not site-specific.
   - Whether or not the structure is within the FEMA 100-year Floodway.
   - Which Erosion Hazard Zone the structure is within.
   - A written description of what the findings mean.

2. A 200-scale color aerial photograph of the Albert's property and adjacent parcels. The FEMA 100-year Floodplain and Floodway are shown as blue and red lines, respectively. The Erosion Hazard Zones defined under the WCMP are shown as areas shaded in red (severe zone), yellow (lateral migration zone), and green (long-term zone). The elevation of the finished floor of the Albert's house is shown (based on a field survey), as well as the FEMA 100-year water surface elevation at their house.

3. A 200-scale cross section of Skunk Creek taken through each structure listed on the Floodplain Status Information Sheet. The profile of the ground using the topography from the 1997 flood insurance study of Skunk Creek is shown, as well as the location of the structure and its finished floor elevation, the limits of the FEMA 100-year Floodway, and the FEMA 100-year water surface elevation.

4. A table listing of peak flow data for Skunk Creek at the USGS Flow Gage at the Skunk Creek crossing of Interstate 17, including approximate return frequencies.

5. A copy of the Maricopa County Floodplain Regulations.

Meeting Results:

Marilyn opened by presenting the goals of the Skunk Creek Watercourse Master Plan (WCMP) and informing the Albert's that their home on Assessor's Parcel 202-21-024B is located entirely within the FEMA 100-year Floodway, and within the severe erosion hazard zone. Marilyn expressed that the purpose of this meeting was informational, intended to inform the Albert's of the flood and erosion hazards present on the property where they reside. These hazards have been identified during the WCMP preparation and warrant an individual meeting to describe the findings. Marilyn thanked the Albert's for taking the time to meet with us.

Tom explained the basics of the Federal Emergency Management Agency (FEMA) National Flood Insurance Program and the differences between the 100-year floodplain and floodway. The concept of a 100-year flood being a flood that has 1% chance of occurring in any given year was explained. The 100-year floodplain was defined as the area subject to being covered by floodwater during a 1% flood. The 100-year floodway was described as a regulatory area reserved for the flow of waters, and as a very hazardous, life-threatening area because of the high depth and velocity of flow. The concept of "squeezing in" the floodplain limits to the floodway limits was described, as was the effects of such floodplain encroachments on velocity, peak discharge and downstream improvements.

The presentation materials were used as examples specific to the Albert's property. Next, Tom described the Erosion Hazard Zones that were prepared as part of the WCMP. The severe erosion hazard zone was described as the area subject to erosion during a large flood, such as the 1% flood. The lateral migration erosion hazard zone was described as the area subject to erosion from a typical series of floods over a 60-year period, including the erosion resulting from a large flood, such as the 1% flood. Tom spent time describing the potential for movement of the main channel of Skunk Creek back and forth across the floodplain using the cross section handout and the plan view. Tom explained that the geomorphology study results show that the main channel of Skunk Creek has moved as much as 400 feet in some areas within the last 60-years. The long-term erosion hazard zone was described as the area expected to be subject to erosion over a much longer period of time, from 60- to 1,000-years. It is the area that geologic evidence shows Skunk Creek has occupied in the past 60- to 1000-years.

Tom then described the three alternatives that are being analyzed as a part of the WCMP. The full-structural alternative was described as implementation of the existing regulations. If encroachment is allowed to continue to occur, then levees and bank protection will be necessary to protect the improvements made within the floodplain. It was explained that this option is very expensive to the public, and that it results in increases in peak discharge downstream because of the loss of over bank storage and increases in flow depths and velocity. The effects of this alternative on the Albert's home were explained. Implementation would result in increased flow depths and velocity through their home, and difficulty of access across the levees. It was explained that if this alternative were selected, their property would probably be recommended for a mandatory buy-out program because the home would lie inside the levees. Building levees around their home would constrict the wash too much and is infeasible.

The nonstructural alternative was described as not allowing any encroachment within the 100-year floodplain or the long-term erosion hazard zone. This is the maximum area the wash needs to function naturally. Implementation would require buying property that is outside the 100-year floodplain and the lateral migration erosion hazard zone. The homes that are in the floodway, especially those within the severe erosion hazard zone, would possibly be included in a voluntary buy-out program. The impact on the Albert's property is that the entire parcel would be restricted from future building, but that they could continue to live there if they choose.

The low-impact structural alternative was described as limiting floodplain encroachment to the lateral migration erosion hazard zone boundary. This is the minimum area the wash needs to function naturally. This alternative results in minimal increases in flow depth and velocity and can be implemented without the construction of levees in most areas. A small portion of their property is within this zone and outside the floodway; therefore, the impact on the Albert's property would be that no building would be allowed in this zone. The possibility of a voluntary buyout program for their property was presented as one possible implementation option. When asked how the Albert's felt about such a program, they were receptive. The Albert's understand there is a safety problem, but asked if there were other options for them. An examination of the handout materials showed that there is an area on their property outside the lateral migration erosion hazard zone that is large enough to build on. The Albert's expressed that their home is an historic structure that was moved onto their property from downtown Phoenix. We discussed the possibility of moving the existing home to the east end of the property, outside the 100-year floodway and the lateral migration erosion hazard zone. It appeared feasible to all of us. Shanna said that if building setback requirements from planning and zoning became a problem, that there was a strong case for a variance because of the necessity to relocate the existing structure because of flood hazards.

The Albert's ended up being interested in the possible buy-out program, but would rather have the County move their home to a safer area on their existing property. Marilyn explained that the buy-out program is voluntary, and that they could still live here if they choose. The request to relocate their home on the same property is also possible. Marilyn explained a little more about the buy-out program stating it would be based on a fair market value appraisal plus an additional relocation expense allowance. Marilyn also made it clear that a buy-out program would have to receive the approval of the Maricopa County Board of Supervisors and that, if approved, would take time to implement, possibly years because of funding constraints. She explained that this has been previously done by the Flood Control District for homes built within the floodway of New River.

Shanna explained that additions to existing homes can be made within a 100-year floodway, but the addition must be a part of the existing structure. The addition cannot exceed 50% of the appraised value of the home at the time of the addition. Also, the 50% value at the time of the first addition is the total amount that can be spent on any additions, then or in the future. Shanna also explained that if the home burns down, or some other similar catastrophe happens, it couldn't be rebuilt.

Marilyn explained that a flood warning system for existing homes in the area was being considered. The meeting lasted about 1½ hours.

Floodplain Status Information Sheet

Parcel Number: 202-21-024B
Owner: Albert
Address: 42745 N. 7th Ave.
New River, AZ 85087
Phone: (623) 465-5971

Project Tag ID # 616

Structure	House	Garage	
Cross Section #	16	17	
Approximate River Mile	22.95	22.96	
Existing Condition 100-yr Flow [cfs]	24,400	24,400	
Existing Condition 100-yr Water Surface Elevation [ft]	1973.4	1974.3	
Finished Floor Elevation (FFE) [ft]	1971.4	1971.4	
Depth of Water Above Finished Floor [ft]	2.0	2.9	
Flow Required to Reach FFE [cfs] (for mobile homes, flow required to reach ground underneath home)	12,200	7,400	
Approx. Storm Return Interval Required to Reach FFE (or ground beneath mobile homes)	30-yr	15-yr	
Is Structure Within Floodway?	Yes	Yes	
Erosion Hazard Zone	Severe	Severe	

Summary of Findings

Both structures on this parcel are subject to flooding and are located within the FEMA 100 year floodway. During the 100-year flood, there would be approximately 1' 11" of water in the house. Lower frequency storms would also cause flooding problems. For the house, the 30-year storm, which has approximately a 3% probability of occuring or being exceeded in any given year, would reach the finished floor elevation. For the garage, the 15-year storm, which has approximately a 7% probability of occuring or being exceeded in any given year, would reach the finished floor elevation.

Both structures are located within the Severe Erosion Hazard Zone. This zone is comprised of the active watercourse channels and adjacent areas likely to be eroded during a single major event, such as the 100-year flood.

US GEOLOGICAL SURVEY
SKUNK CREEK PEAK FLOW DATA

Station name: Skunk Creek Near Phoenix, Ariz.

Station number: 09513860

Location: On right bank dike of Skunk Creek flood control channel, 300 ft east of frontage road of Interstate Highway 17, 3 mi north of Adobe and 20 mi north of City Hall in Phoenix. Lat 33°43'45", Long 112°07'09", in NW1/4SE1/4SE1/4 sec.35, T.5 N., R.2 E., Maricopa County, Hydrologic Unit 15070102.

Water Years Retrieved: 1959 through 1999

Date	Discharge [cfs]	Approximate Return Frequency
---	---	
---	---	
---	---	
08/01/1964	11,500	23-yr
09/05/1970	9,650	18-yr
12/25/1959	9,400	17-yr
08/12/1990	8,160	14-yr
08/23/1992	7,020	11-yr
11/30/1982	6,170	10-yr
12/19/1967	5,900	
01/08/1993	4,990	
08/21/1971	4,770	
10/06/1972	4,700	
08/19/1970	4,460	
03/01/1978	3,590	
10/10/1986	3,440	
02/28/1978	3,380	
08/17/1971	3,260	
01/11/1993	3,160	
07/24/1990	3,110	
08/15/1990	2,900	
07/15/1999	2,620	
11/08/1982	2,570	
07/17/1972	2,380	
01/17/1978	2,340	
11/01/1987	2,250	
08/30/1988	2,200	
12/10/1982	2,180	
09/03/1990	2,090	
12/01/1982	1,730	
07/14/1999	1,690	
12/23/1982	1,460	
10/19/1972	1,420	
01/26/1985	1,320	
08/11/1991	1,250	
10/11/1986	1,250	
02/20/1980	1,210	
02/09/1993	1,170	
12/19/1991	1,140	
02/13/1978	1,080	
09/02/1967	950	
03/01/1991	939	
07/22/1986	906	
02/28/1991	844	

100-yr = 27,600 cfs

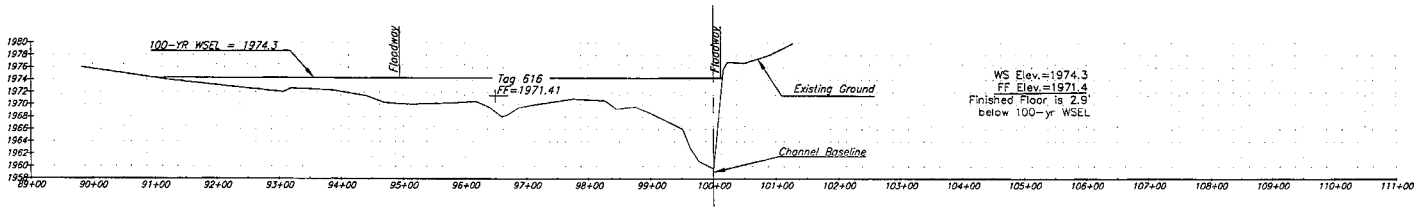
25-yr = 12,100 cfs

10-yr = 6,120 cfs

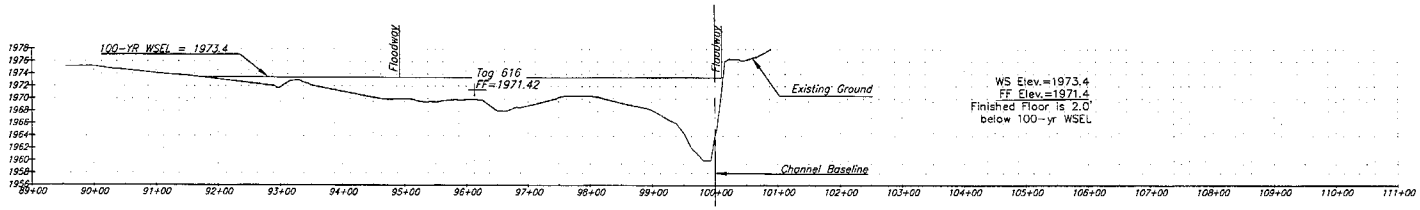
5-yr = 3,230 cfs

2-yr = 960 cfs

17
Garage



16
House



NO.	REVISIONS	DATE	BY	CHK.

XS616.DWG

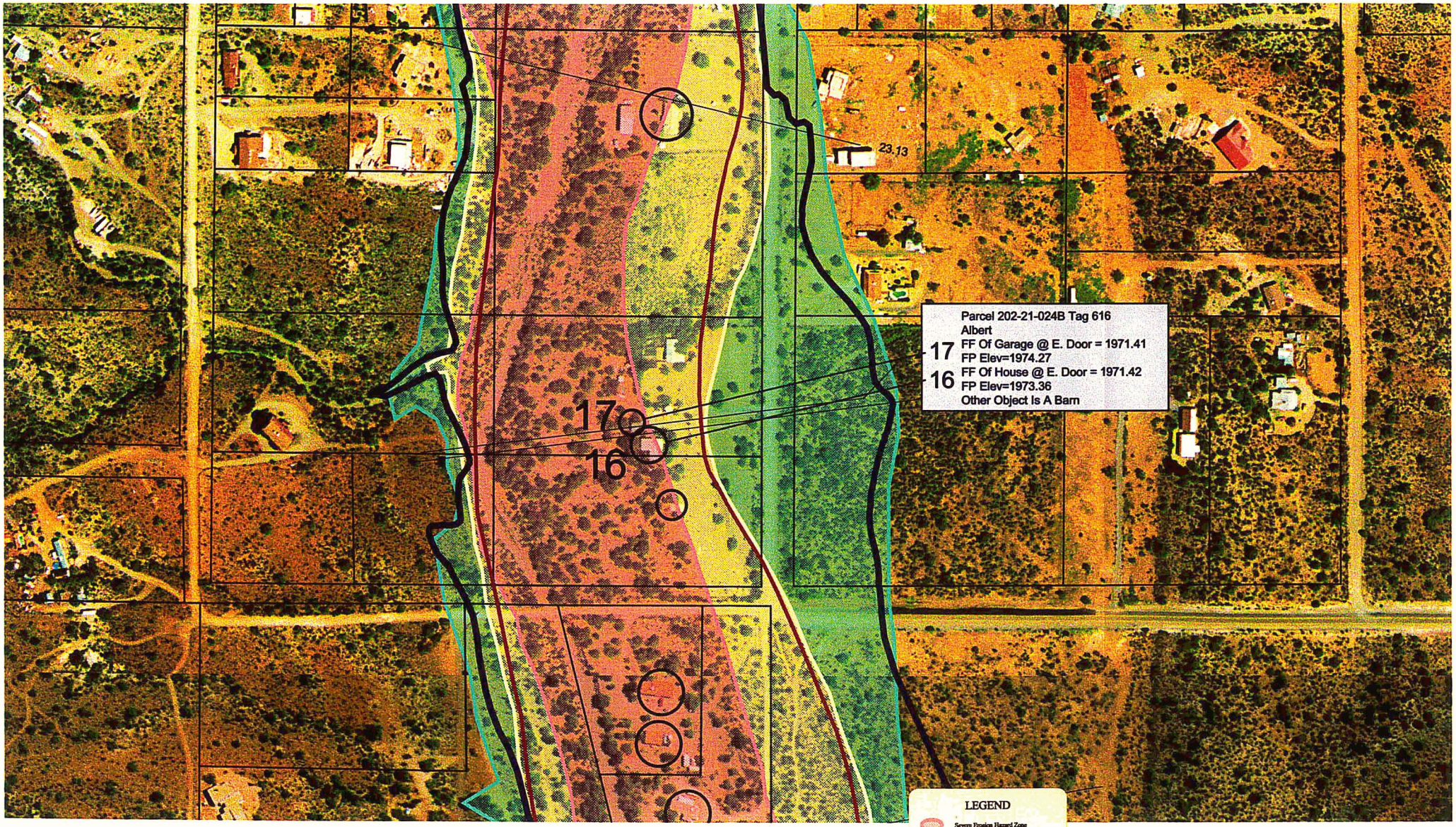
TETRA TECH, INC.
INFRASTRUCTURE SOUTHWEST GROUP
301 North 44th Street, Suite 125, Phoenix, AZ 85008
(602) 629-1100 · FAX (602) 629-1186

SKUNK CREEK PHASE II
WATERCOURSE MASTER PLAN

JOB NO.	2350.0002
DESIGNED BY:	LML
DRAWN BY:	LML
CHECKED BY:	TRL
APPROVED BY:	TRL
DATE:	

STRUCTURE CROSS SECTIONS
Owner: ALBERT
Cross Sections: 16, 17

SCALE: HORIZ: 1"= 200'
CONT. INTERVAL =
DRAWING NO.
SHEET NO. OF:



AERIAL PHOTO DATE: 7/1999

N

Scale: 1"=200'

TETRA TECH, INC
INFRASTRUCTURE SOUTHWEST GROUP
501 North 44th Street, Suite 125, Phoenix, AZ 85008
(602) 620-1100 FAX (602) 620-1105

Parcels 211-22-002J and 211-22-002B

Home Owner: 211-22-002J - Sharon Geraci; 211-22-002B - Jim and Kasey McKeag
Meeting Date: March 13, 2001
Meeting Location: 755 W. Honda Bow, New River, AZ

In Attendance:

Ms. Sharon Geraci
Mr. Jim McKeag
Mrs. Kasey McKeag
Ms. ???????, a realtor and resident of the area
Ms. Marilyn DeRosa, FCDMC
Mrs. Shanna Yeager, FCDMC
Mr. Tom Loomis, Tetra Tech, Inc.

Handout Materials:

1. Floodplain Status Information Sheet. This 1-page sheet lists information about structures on both properties in question. It includes:

   - The FEMA 100-year peak discharge and estimated water surface elevation at each structure.
   - The finished floor elevation of the structure.
   - The estimated depth of water above the finished floor during a 100-year flood.
   - The estimated flow rate in Skunk Creek where the floor first begins to be flooded (for mobile homes, the flow rate required to start flooding the ground under the mobile).
   - The approximate flood return interval for the flow rate required to reach the finished floor elevation, or the ground beneath mobile homes. The return interval is in relation to a flood frequency curve for the USGS Flow Gage at the Skunk Creek crossing of Interstate 17, and is not site-specific.
   - Whether or not the structure is within the FEMA 100-year Floodway.
   - Which Erosion Hazard Zone the structure is within.
   - A written description of what the findings mean.

2. A 200-scale color aerial photograph of the Geraci and McKeag's property and adjacent parcels. The FEMA 100-year Floodplain and Floodway are shown as blue and red lines, respectively. The Erosion Hazard Zones defined under the WCMP are shown as areas shaded in red (severe zone), yellow (lateral migration zone), and green (long-term zone). The elevation of the finished floor of the McKeag's house, and the Geraci mobile home, are shown (based on a field survey), as well as the FEMA 100-year water surface elevation at their homes.

3. A 200-scale cross section of Skunk Creek taken through each structure listed on the Floodplain Status Information Sheet. The profile of the ground using the topography from the 1997 flood insurance study of Skunk Creek is shown, as well as the location of the structure and its finished floor elevation, the limits of the FEMA 100-year Floodway, and the FEMA 100-year water surface elevation.

4. A table listing of peak flow data for Skunk Creek at the USGS Flow Gage at the Skunk Creek crossing of Interstate 17, including approximate return frequencies.

5. A copy of the Maricopa County Floodplain Regulations.

Meeting Results:

A joint meeting was held with Ms. Geraci and the McKeag's, at their request. The meeting was held in the McKeag residence. Marilyn opened by presenting the goals of the Skunk Creek Watercourse Master Plan (WCMP) and informing Ms. Geraci and the McKeag's that their homes on Assessor's Parcel 211-22-002J and 211-22-002B are located entirely within the FEMA 100-year Floodway, and within the severe erosion hazard zone. Marilyn expressed that the purpose of this meeting was informational, intended to inform Ms. Geraci and the McKeag's of the flood and erosion hazards present on the property where they reside. These hazards have been identified during the WCMP preparation and warrant an individual meeting to describe the findings. Marilyn thanked Ms. Geraci and the McKeag's for taking the time to meet with us.

Tom explained the basics of the Federal Emergency Management Agency (FEMA) National Flood Insurance Program and the differences between the 100-year floodplain and floodway. The concept of a 100-year flood being a flood that has 1% chance of occurring in any given year was explained. The 100-year floodplain was defined as the area subject to being covered by floodwater during a 1% flood. The 100-year floodway was described as a regulatory area reserved for the flow of waters, and as a very hazardous, life-threatening area because of the high depth and velocity of flow. The concept of "squeezing in" the floodplain limits to the floodway limits was described, as was the effects of such floodplain encroachments on velocity, peak discharge and downstream improvements.

The presentation materials were used as examples specific to Ms. Geraci's and the McKeag's property. Next, Tom described the Erosion Hazard Zones that were prepared as part of the WCMP. The severe erosion hazard zone was described as the area subject to erosion during a large flood, such as the 1% flood. The lateral migration erosion hazard zone was described as the area subject to erosion from a typical series of floods over a 60-year period, including the erosion resulting from a large flood, such as the 1% flood. Tom spent time describing the potential for movement of the main channel of Skunk Creek back and forth across the floodplain using the cross section handout and the plan view. Tom explained that the geomorphology study results show that the main channel of Skunk Creek has moved as much as 400 feet in some areas within the last 60-years. The long-term erosion hazard zone was described as the area expected to be subject to erosion over a much longer period of time, from 60- to 1,000-years. It is the area that geologic evidence shows Skunk Creek has occupied in the past 60- to 1000-years.

Tom then described the three alternatives that are being analyzed as a part of the WCMP. The full-structural alternative was described as implementation of the existing regulations. If encroachment is allowed to continue to occur, then levees and bank protection will be necessary to protect the improvements made within the floodplain. It was explained that this option is very expensive to the public, and that it results in increases in peak discharge downstream because of the loss of over bank storage and increases in flow depths and velocity. The effects of this alternative on Ms. Geraci's and the McKeag's homes were explained. Implementation would result in increased flow depths and velocity through their homes, and difficulty of access across the levees. Ms. Geraci's mobile home has a finished floor elevation the same as the 100-year flood water surface elevation. Her home is still in a very hazardous location because of the high velocity of flow under the mobile home that can knock down the supporting pillars. It was explained that if this alternative were selected, their property would probably be recommended for a mandatory buy-out program because the home would lie inside the levees. Building levees around their home would constrict the wash too much and is infeasible.

The nonstructural alternative was described as not allowing any encroachment within the 100-year floodplain or the long-term erosion hazard zone. This is the maximum area the wash needs to function naturally. Implementation would require buying property that is outside the 100-year floodplain and the lateral migration erosion hazard zone. The homes that are in the floodway, especially those within the severe erosion hazard zone, would possibly be included in a voluntary buy-out program. The impact on Ms. Geraci's and the McKeag's properties is that both parcels would be restricted from future building, but that they could continue to live there if they choose.

The low-impact structural alternative was described as limiting floodplain encroachment to the lateral migration erosion hazard zone boundary. This is the minimum area the wash needs to function naturally. This alternative results in minimal increases in flow depth and velocity and can be implemented without the construction of levees in most areas. All of Ms. Geraci's property is within the 100-year floodway, and most is within the severe erosion hazard zone; therefore, no new building's that obstruct flow would be allowed on her property. All of the McKeag's property is within the severe erosion hazard zone and the 100-year floodway; therefore, no new building's that obstruct flow would be allowed on their property. The possibility of a voluntary buyout program for their properties was presented as one possible implementation option.

When asked how the McKeag's felt about such a program, they were receptive. The McKeag's understand there is a safety problem. When asked how Ms. Geraci felt about such a program, she was receptive, but very upset because it would probably not happen soon enough to help her. Ms. Geraci related that she had bought the property thinking she could add other structures she needs to be able to conduct a single proprietor business. Ms. Geraci is a horse trainer and also makes tack. She has been unable to conduct her business properly because she cannot obtain a building permit for an enclosed barn and outbuildings because her entire property is within the 100-year floodway. She expressed that she cannot afford to subsidize her business much longer.

Shanna asked if the barn had to be enclosed, or if a pole-type barn would suffice. Ms. Geraci said she might be able to get by with a pole barn, but that she needs extra-enclosed space to perform her tack and saddle business. Shanna asked if an addition to her mobile would help. She said maybe. Shanna and Ms. Geraci discussed this at length, with the main concern being the investment into a property that she would have trouble selling and getting her investment back.

Marilyn explained that the buy-out program is voluntary, and that they could still live here if they choose. Marilyn explained a little more about the buy-out program stating it would be based on a fair market value appraisal plus an additional relocation expense allowance. Marilyn also made it clear that a buy-out program would have to receive the approval of the Maricopa County Board of Supervisors and that, if approved, would take time to implement, possibly years because of funding constraints. She explained that this has been previously done by the Flood Control District for homes built within the floodway of New River.

Shanna explained that additions to existing homes can be made within a 100-year floodway, but the addition must be a part of the existing structure. The addition cannot exceed 50% of the appraised value of the home at the time of the addition. Also, the 50% value at the time of the first addition is the total amount that can be spent on any additions, then or in the future. Shanna also explained that if the home burns down, or some other similar catastrophe happens, it couldn't be rebuilt.

Marilyn explained that a flood warning system for existing homes in the area was being considered. Mr. McKeag was extremely interested in this system. He explained that he works for Southwest Airlines and will be sent to Houston, TX for training this fall. He will be gone for several months, which makes him very uncomfortable in light of the situation we explained to him. His wife and baby will be alone during this period, so if a flood happened while he was gone, no one would be there to help them. Mr. McKeag said he has watched the main channel of Skunk Creek during several storms and has noticed that the bank near his home is eroded each time the wash carries water. Also, during one large storm, the water reached the top of the bank and almost overflowed onto the area where his house is located. We explained to Mr. McKeag that the depth of flow in his house during a 1% storm would be about 3 feet. Mr. McKeag asked that we fast track a flood warning plan and system, so it could be in place before the summer monsoon season. We asked him to write or call Mr. Ellegood, the head of the Flood Control District, and express his concern and the immediate need for a flood warning system.

The meeting lasted about 2 hours.

Floodplain Status Information Sheet

Parcel Number: 211-22-002B
Owner: McKeag
Address: 755 W. Honda Bow Rd.
New River, AZ 85086
Phone:

Project Tag ID # 5

Structure	House	Garage	
Cross Section #	14	13	
Approximate River Mile	22.90	22.89	
Existing Condition 100-yr Flow [cfs]	24,400	24,400	
Existing Condition 100-yr Water Surface Elevation [ft]	1968.3	1967.0	
Finished Floor Elevation (FFE) [ft]	1965.3	1964.0	
Depth of Water Above Finished Floor [ft]	3.0	3.0	
Flow Required to Reach FFE [cfs] (for mobile homes, flow required to reach ground underneath home)	8,000	8,600	
Approx. Storm Return Interval Required to Reach FFE (or ground beneath mobile homes)	17-yr	20-yr	
Is Structure Within Floodway?	Yes	Yes	
Erosion Hazard Zone	Severe	Severe	

Summary of Findings

Both structures on this parcel are subject to flooding and are located within the FEMA 100 year floodway. During the 100-year flood, there would be approximately 3 feet of water in the house and garage. Lower frequency storms would also cause flooding problems. For the house, the 17-year storm, which has approximately a 6% probability of occuring or being exceeded in any given year, would reach the finished floor elevation.

Both structures are located within the Severe Erosion Hazard Zone. This zone is comprised of the active watercourse channels and adjacent areas likely to be eroded during a single major event, such as the 100-year flood.

US GEOLOGICAL SURVEY
SKUNK CREEK PEAK FLOW DATA

Station name: Skunk Creek Near Phoenix, Ariz.

Station number: 09513860

Location: On right bank dike of Skunk Creek flood control channel, 300 ft east of frontage road of Interstate Highway 17, 3 mi north of Adobe and 20 mi north of City Hall in Phoenix. Lat 33°43'45", Long 112°07'09", in NW1/4SE1/4SE1/4 sec.35, T.5 N., R.2 E., Maricopa County, Hydrologic Unit 15070102.

Water Years Retrieved: 1959 through 1999

Date	Discharge [cfs]	Approximate Return Frequency
---	---	
---	---	
---	---	
08/01/1964	11,500	23-yr
09/05/1970	9,650	18-yr
12/25/1959	9,400	17-yr
08/12/1990	8,160	14-yr
08/23/1992	7,020	11-yr
11/30/1982	6,170	10-yr
12/19/1967	5,900	
01/08/1993	4,990	
08/21/1971	4,770	
10/06/1972	4,700	
08/19/1970	4,460	
03/01/1978	3,590	
10/10/1986	3,440	
02/28/1978	3,380	
08/17/1971	3,260	
01/11/1993	3,160	
07/24/1990	3,110	
08/15/1990	2,900	
07/15/1999	2,620	
11/08/1982	2,570	
07/17/1972	2,380	
01/17/1978	2,340	
11/01/1987	2,250	
08/30/1988	2,200	
12/10/1982	2,180	
09/03/1990	2,090	
12/01/1982	1,730	
07/14/1999	1,690	
12/23/1982	1,460	
10/19/1972	1,420	
01/26/1985	1,320	
08/11/1991	1,250	
10/11/1986	1,250	
02/20/1980	1,210	
02/09/1993	1,170	
12/19/1991	1,140	
02/13/1978	1,080	
09/02/1967	950	
03/01/1991	939	
07/22/1986	906	
02/28/1991	844	

100-yr = 27,600 cfs

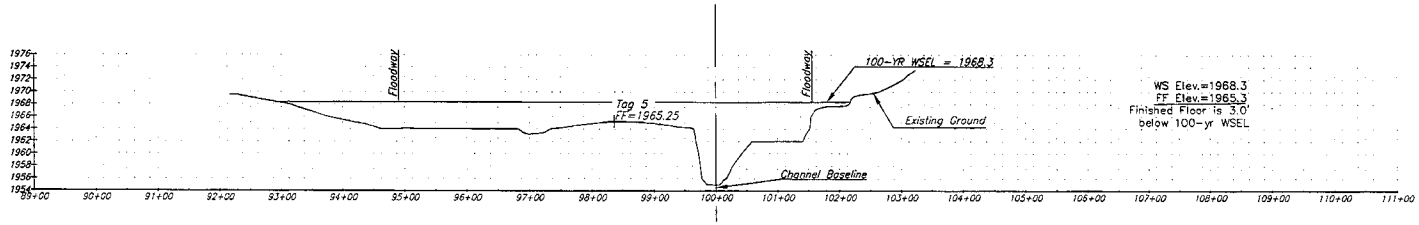
25-yr = 12,100 cfs

10-yr = 6,120 cfs

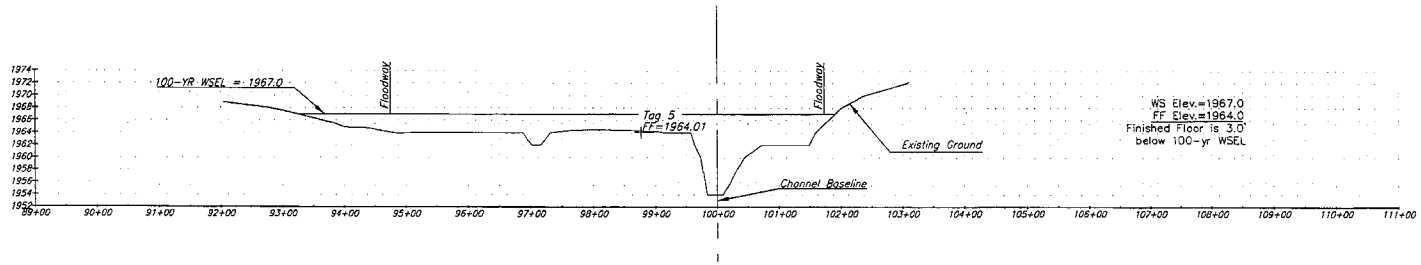
5-yr = 3,230 cfs

2-yr = 960 cfs

14
House



13
Garage



NO.	REVISIONS	DATE	BY	CHK.

XSS.DWG

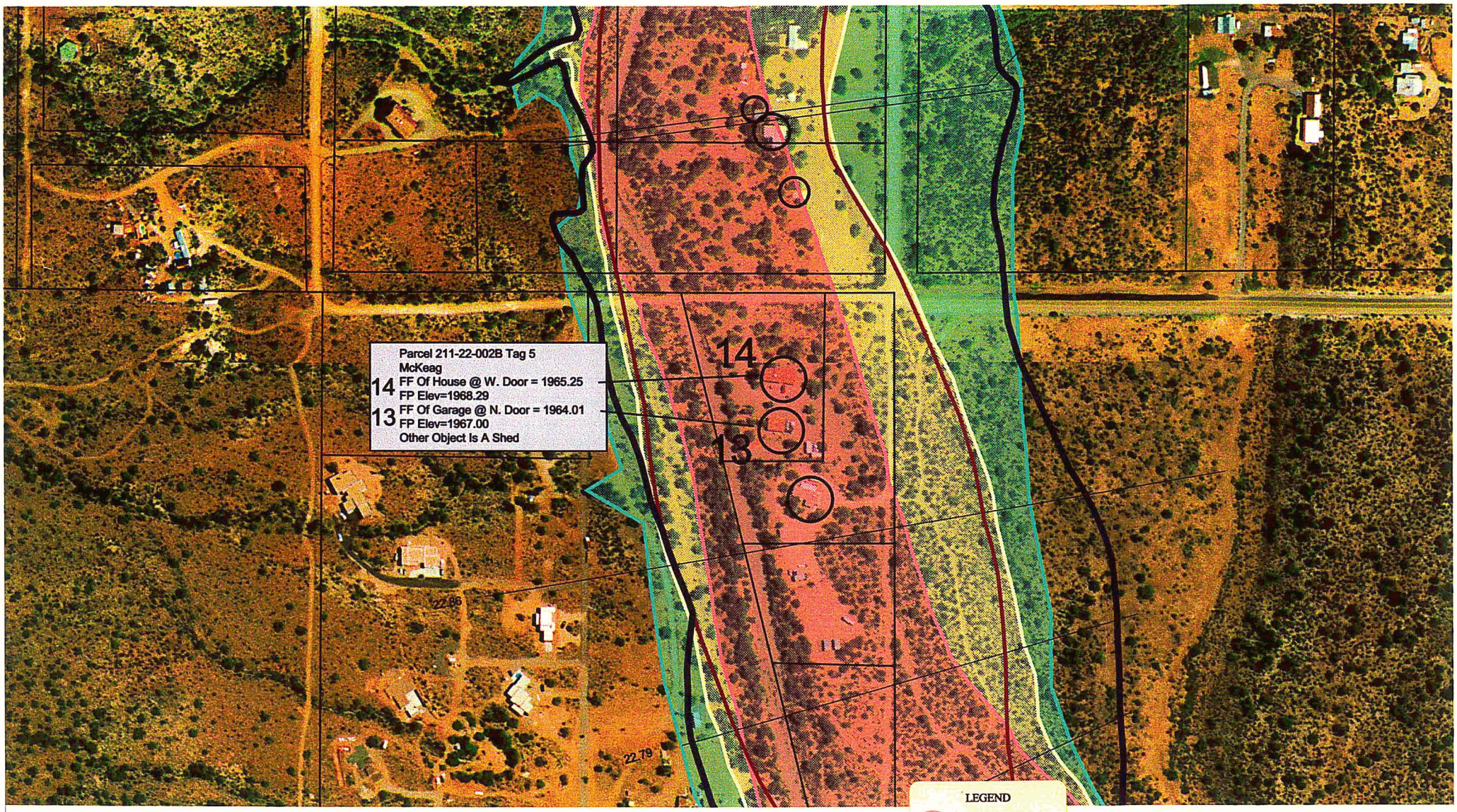
TETRA TECH, INC.
INFRASTRUCTURE SOUTHWEST GROUP
501 North 44th Street, Suite 125, Phoenix, AZ 85008
(602) 629-1100 FAX (602) 629-1186

SKUNK CREEK PHASE II
WATERCOURSE MASTER PLAN

JOB NO.	2350.0002
DESIGNED BY:	LML
DRAWN BY:	LML
CHECKED BY:	TRL
APPROVED BY:	TRL
DATE:	

STRUCTURE CROSS SECTIONS
Owner: McKEAG
Cross Sections: 13, 14

SCALE: HORIZ: 1"= 200'
CONT. INTERVAL =
DRAWING NO.
SHEET NO. OF:



AERIAL PHOTO DATE: 7/1999

N

Scale: 1"=200'

TETRA TECH, INC
INFRASTRUCTURE SOUTHWEST GROUP

Floodplain Status Information Sheet

Parcel Number: 211-22-002J
Owner: Geraci
Address: 705 W. Honda Bow Rd.
New River, AZ 85086
Phone: (623) 465-2687

Project Tag ID # 6

Structure	Mobile Home		
Cross Section #	12		
Approximate River Mile	22.87		
Existing Condition 100-yr Flow [cfs]	24,400		
Existing Condition 100-yr Water Surface Elevation [ft]	1965.4		
Finished Floor Elevation (FFE) [ft]	1965.4		
Depth of Water Above Finished Floor [ft]	0.0		
Flow Required to Reach FFE [cfs] (for mobile homes, flow required to reach ground underneath home)	13,500		
Approx. Storm Return Interval Required to Reach FFE (or ground beneath mobile homes)	36-yr		
Is Structure Within Floodway?	Yes		
Erosion Hazard Zone	Severe		

Summary of Findings

The mobile home on this parcel is located within the FEMA 100-year floodway. The floodwater reaches the finished floor elevation in the 100-year flood. However, for mobile homes, the floodwaters do not have to reach the finished floor elevation to pose a hazard to the structure. As soon as water flows underneath the home, there is a danger that the foundation piers could be undermined and subsequently fail. This condition occurs in a storm frequency as low as the 36-year storm, which has approximately a 3% probability of occuring or being exceeded in any given year.

The home is located within the Severe Erosion Hazard Zone. This zone is comprised of the active watercourse channels and adjacent areas likely to be eroded during a single major event, such as the 100-year flood.

US GEOLOGICAL SURVEY
SKUNK CREEK PEAK FLOW DATA

Station name: Skunk Creek Near Phoenix, Ariz.

Station number: 09513860

Location: On right bank dike of Skunk Creek flood control channel, 300 ft east of frontage road of Interstate Highway 17, 3 mi north of Adobe and 20 mi north of City Hall in Phoenix. Lat 33°43'45", Long 112°07'09", in NW1/4SE1/4SE1/4 sec.35, T.5 N., R.2 E., Maricopa County, Hydrologic Unit 15070102.

Water Years Retrieved: 1959 through 1999

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07/15/1999	2,620	
11/08/1982	2,570	
07/17/1972	2,380	
01/17/1978	2,340	
11/01/1987	2,250	
08/30/1988	2,200	
12/10/1982	2,180	
09/03/1990	2,090	
12/01/1982	1,730	
07/14/1999	1,690	
12/23/1982	1,460	
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10/11/1986	1,250	
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02/09/1993	1,170	
12/19/1991	1,140	
02/13/1978	1,080	
09/02/1967	950	
03/01/1991	939	
07/22/1986	906	
02/28/1991	844	

100-yr = 27,600 cfs

25-yr = 12,100 cfs

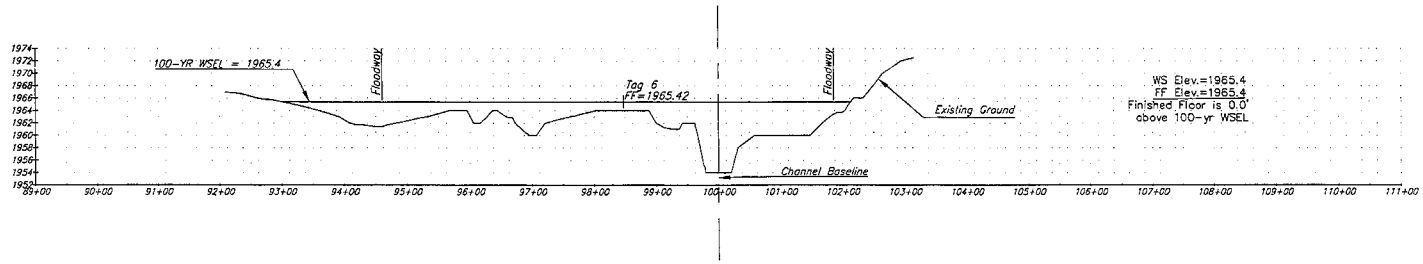
10-yr = 6,120 cfs

5-yr = 3,230 cfs

2-yr = 960 cfs

12

Mobile Home



NO.	REVISIONS	DATE	BY	CHK.

XS6.DWG

TETRA TECH, INC.
INFRASTRUCTURE SOUTHWEST GROUP
501 North 44th Street, Suite 125, Phoenix, AZ 85008
(602) 629-1100 FAX (602) 629-1186

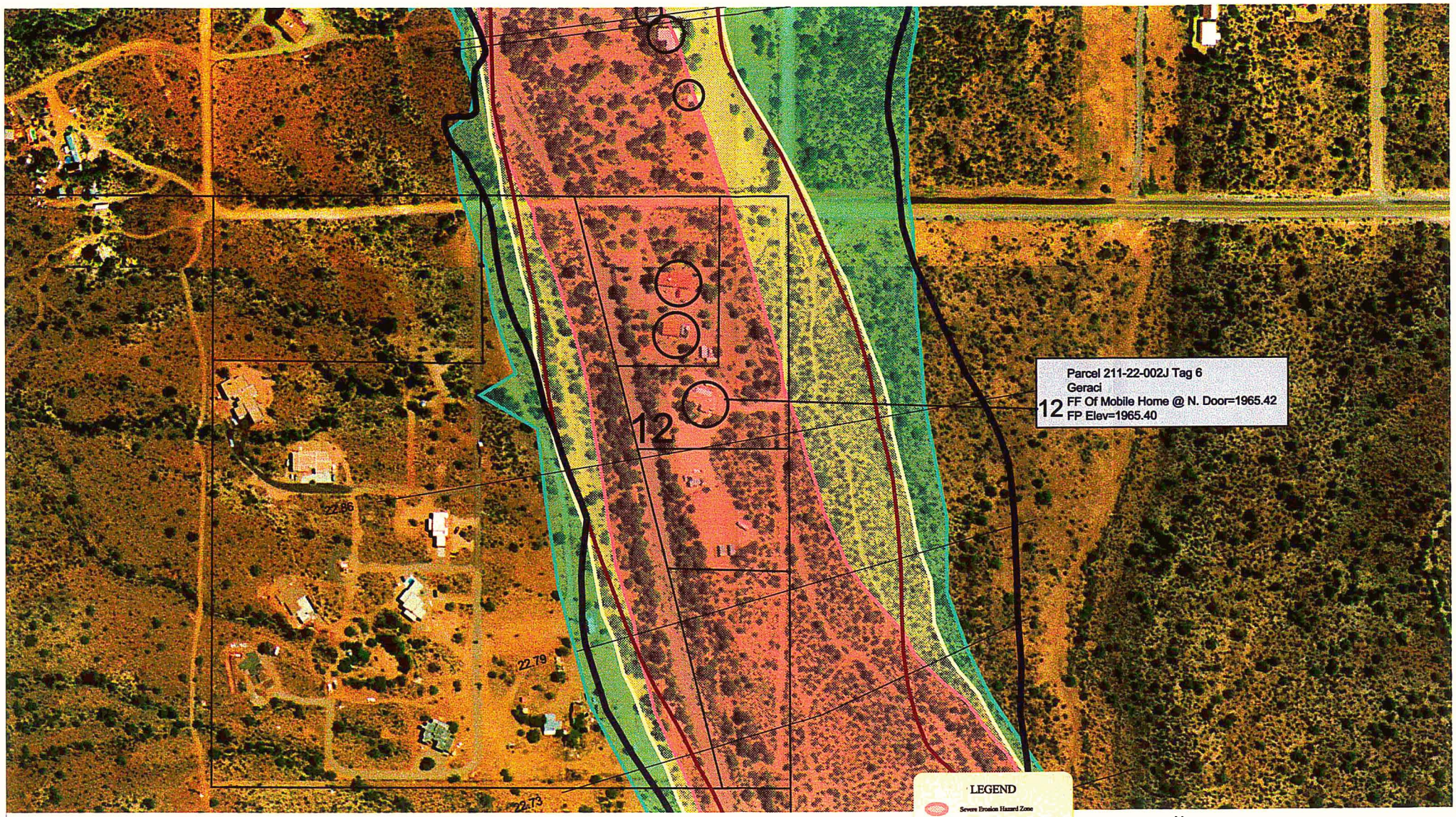
SKUNK CREEK PHASE II

WATERCOURSE MASTER PLAN

JOB NO.	2350.0002
DESIGNED BY:	LML
DRAWN BY:	LML
CHECKED BY:	TRL
APPROVED BY:	TRL
DATE:	

STRUCTURE CROSS SECTIONS
Owner: GERACI
Cross Section: 12

SCALE: HORIZ: 1" = 200'
CONT. INTERVAL =
DRAWING NO.
SHEET NO. OF:



AERIAL PHOTO DATE: 7/1999

Scale: 1"=200'

TETRA TECH, INC
INFRASTRUCTURE SOUTHWEST GROUP
[illegible]

Parcel 202-21-169

Home Owner: Joe and Claudia Hines
Meeting Date: March 30, 2001
Meeting Location: 43012 N. 7th Avenue, New River, AZ

In Attendance:

Mr. Joe Hines
Mrs. Claudia Hines
Mr. Tom Loomis, Tetra Tech, Inc.

Handout Materials:

Used the same materials as the first meeting. 400-scale work maps of the entire Phase II study area were used.

Meeting Results:

A second meeting was held at the request of Mr. Hines. Mr. Hines asked for further clarification of how Cline Creek affects erosion in Skunk Creek. Mr. Hines still believed that Cline Creek forces the Skunk Creek channel toward the west at his property, and wanted to walk the creek to show me his concerns. We walked the main channel of Skunk Creek upstream to the north line of Assessor's Parcel 202-21-175, two parcels north of Mr. Hines property. Mr. Hines's next-door neighbor on the north, Mr. Roler, joined us. When we reached the north line of parcel 202-21-175, two channels merge in the downstream direction. Mr. Hines said he thought the larger channel coming in from the northeast was Cline Creek. I showed him on my work maps that that is the main channel of Skunk Creek, and that Cline Creek joins Skunk Creek about 1,600 feet farther upstream. We then walked west across Skunk Creek to the west side, near the 100-year floodplain limits, so Mr. Hines and Mr. Roler could get a feel for how wide the active wash area is, and how many braided channels are present. We then walked near the west floodway line back to Mr. Hines property. Both were amazed at the width of the floodplain, and after studying the work maps, had a better understanding of how the main channel moves over time, and how hazardous the area is.

Tom met with Mr. Roler briefly afterwards and made an appointment to go over the WCMP findings for Mr. Roler's property with him and his wife. The appointment was made for April 9, 2001.

Parcel 202-21-168

Home Owner: Clayton and Claudia Roler
Meeting Date: April 9, 2001
Meeting Location: 43024 N. 7th Avenue, New River, AZ

In Attendance:

Mr. Clay Roler
Mr. Doug Williams, FCDMC
Mr. Tom Loomis, Tetra Tech, Inc.

Handout Materials:

1. Floodplain Status Information Sheet. This 1-page sheet lists information about structures on both properties in question. It includes:

   - The FEMA 100-year peak discharge and estimated water surface elevation at each structure.
   - The finished floor elevation of the structure.
   - The estimated depth of water above the finished floor during a 100-year flood.
   - The estimated flow rate in Skunk Creek where the floor first begins to be flooded (for mobile homes, the flow rate required to start flooding the ground under the mobile).
   - The approximate flood return interval for the flow rate required to reach the finished floor elevation, or the ground beneath mobile homes. The return interval is in relation to a flood frequency curve for the USGS Flow Gage at the Skunk Creek crossing of Interstate 17, and is not site-specific.
   - Whether or not the structure is within the FEMA 100-year Floodway.
   - Which Erosion Hazard Zone the structure is within.
   - A written description of what the findings mean.

2. A 200-scale color aerial photograph of the Roler's property and adjacent parcels. The FEMA 100-year Floodplain and Floodway are shown as blue and red lines, respectively. The Erosion Hazard Zones defined under the WCMP are shown as areas shaded in red (severe zone), yellow (lateral migration zone), and green (long-term zone). The elevation of the finished floor of the Roler's house is shown (based on a field survey), as well as the FEMA 100-year water surface elevation at their home.

3. A 200-scale cross section of Skunk Creek taken through each structure listed on the Floodplain Status Information Sheet. The profile of the ground using the topography from the 1997 flood insurance study of Skunk Creek is shown, as well as the location of the structure and its finished floor elevation, the limits of the FEMA 100-year Floodway, and the FEMA 100-year water surface elevation.

4. A table listing of peak flow data for Skunk Creek at the USGS Flow Gage at the Skunk Creek crossing of Interstate 17, including approximate return frequencies.

5. A copy of the Maricopa County Floodplain Regulations.

Meeting Results:

Doug opened by presenting the goals of the Skunk Creek Watercourse Master Plan (WCMP) and informing Mr. Roler that his home on Assessor's Parcel 202-21-168 is located outside the FEMA 100-year Floodway and the severe erosion hazard zone. The home does lie within the lateral migration erosion hazard zone. Doug expressed that the purpose of this meeting was informational, intended to inform Mr. Roler of the flood and erosion hazards present on the property where he resides. These hazards have been identified during the WCMP preparation. Doug explained that we are meeting with him at his request. Other individual meetings have been held with some of the Roler's neighbor's at Flood Control District request because their homes are within the FEMA 100-year Floodway.

Tom explained the basics of the Federal Emergency Management Agency (FEMA) National Flood Insurance Program and the differences between the 100-year floodplain and floodway. The concept of a 100-year flood being a flood that has 1% chance of occurring in any given year was explained. The 100-year floodplain was defined as the area subject to being covered by floodwater during a 1% flood. The 100-year floodway was described as a regulatory area reserved for the flow of waters, and as a very hazardous, life-threatening area because of the high depth and velocity of flow. The concept of "squeezing in" the floodplain limits to the floodway limits was described, as was the effects of such floodplain encroachments on velocity, peak discharge and downstream improvements.

Tom described the Erosion Hazard Zones that were prepared as part of the WCMP. The severe erosion hazard zone was described as the area subject to erosion during a large flood, such as the 1% flood. The lateral migration erosion hazard zone was described as the area subject to erosion from a typical series of floods over a 60-year period, including the erosion resulting from a large flood, such as the 1% flood. Tom spent time describing the potential for movement of the main channel of Skunk Creek back and forth across the floodplain using the cross section handout and the plan view. Tom explained that the geomorphology study results show that the main channel of Skunk Creek has moved as much as 400 feet in some areas within the last 60-years. The long-term erosion hazard zone was described as the area expected to be subject to erosion over a much longer period of time, from 60- to 1,000-years. It is the area that geologic evidence shows Skunk Creek has occupied in the past 60- to 1000-years.

Tom then described the three alternatives that are being analyzed as a part of the WCMP. The full-structural alternative was described as implementation of the existing regulations. If encroachment is allowed to continue to occur, then levees and bank protection will be necessary to protect the improvements made within the floodplain. It was explained that this option is very expensive to the public, and that it results in increases in peak discharge downstream because of the loss of over bank storage and increases in flow depths and velocity. The effects of this alternative on the Roler's home were explained. Implementation would result in levees being constructed on their property, but their existing home would be outside the east levee. It was explained that if this alternative were selected, the area outside the FEMA 100-year Floodway would be buildable, but that this alternative was very expensive and would result in severe public safety issues and expenditure of public funds downstream of the study area.

The nonstructural alternative was described as not allowing any encroachment within the 100-year floodplain or the long-term erosion hazard zone. This is the maximum area the wash needs to function naturally. Implementation would require buying property that is outside the 100-year floodplain and the lateral migration erosion hazard zone. The homes that are in the floodway would possibly be included in a voluntary buy-out program. The impact on the Roler's

property is that the entire parcel would be restricted from future building, but that they could continue to live there if they choose.

The low-impact structural alternative was described as limiting floodplain encroachment to the lateral migration erosion hazard zone boundary. This is the minimum area the wash needs to function naturally. This alternative results in minimal increases in flow depth and velocity and can be implemented without the construction of levees in most areas. Since almost all of their property is within this zone, the impact on the Roler's property would be that no building would be allowed in this zone. Mr. Roler asked if a buy-out program was proposed for people in his situation. Doug told him that since his home was outside the FEMA 100-year Floodway, no buy-out option would be recommended.

Mr. Roler asked if he could add onto his home. Doug explained that he thought so at this time, but that might change if the Maricopa County Board of Supervisors adopts the WCMP.

Tom explained that a flood warning system for existing homes in the area was being considered. The meeting lasted about 1 hour.

Floodplain Status Information Sheet

Parcel Number: 202-21-168
Owner: Roler
Address: 43024 N. 7th Ave.
New River, AZ 85087
Phone:

Project Tag ID # 846

Structure	House		
Cross Section #	29		
Approximate River Mile	23.24		
Existing Condition 100-yr Flow [cfs]	24,400		
Existing Condition 100-yr Water Surface Elevation [ft]	1985.9		
Finished Floor Elevation (FFE) [ft]	1985.9		
Depth of Water Above Finished Floor [ft]	0.0		
Flow Required to Reach FFE [cfs] (for mobile homes, flow required to reach ground underneath home)	24,400		
Approx. Storm Return Interval Required to Reach FFE (or ground beneath mobile homes)	100-yr		
Is Structure Within Floodway?	No		
Erosion Hazard Zone	Lateral Migration		

Summary of Findings

The home on this parcel is located within the FEMA 100-year floodplain. During the 100-year flood, the water surface would be approximately even with the finished floor of the home.

The structure is located within the Lateral Migration Erosion Hazard Zone. The danger of erosion in this zone is less than in the Severe Erosion Hazard Zone, but could occur at some point within the next 60 years.

US GEOLOGICAL SURVEY
SKUNK CREEK PEAK FLOW DATA

Station name: Skunk Creek Near Phoenix, Ariz.

Station number: 09513860

Location: On right bank dike of Skunk Creek flood control channel, 300 ft east of frontage road of Interstate Highway 17, 3 mi north of Adobe and 20 mi north of City Hall in Phoenix. Lat 33°43'45", Long 112°07'09", in NW1/4SE1/4SE1/4 sec.35, T.5 N., R.2 E., Maricopa County, Hydrologic Unit 15070102.

Water Years Retrieved: 1959 through 1999

Date	Discharge [cfs]	Approximate Return Frequency
---	---	
---	---	
---	---	
08/01/1964	11,500	23-yr
09/05/1970	9,650	18-yr
12/25/1959	9,400	17-yr
08/12/1990	8,160	14-yr
08/23/1992	7,020	11-yr
11/30/1982	6,170	10-yr
12/19/1967	5,900	
01/08/1993	4,990	
08/21/1971	4,770	
10/06/1972	4,700	
08/19/1970	4,460	
03/01/1978	3,590	
10/10/1986	3,440	
02/28/1978	3,380	
08/17/1971	3,260	
01/11/1993	3,160	
07/24/1990	3,110	
08/15/1990	2,900	
07/15/1999	2,620	
11/08/1982	2,570	
07/17/1972	2,380	
01/17/1978	2,340	
11/01/1987	2,250	
08/30/1988	2,200	
12/10/1982	2,180	
09/03/1990	2,090	
12/01/1982	1,730	
07/14/1999	1,690	
12/23/1982	1,460	
10/19/1972	1,420	
01/26/1985	1,320	
08/11/1991	1,250	
10/11/1986	1,250	
02/20/1980	1,210	
02/09/1993	1,170	
12/19/1991	1,140	
02/13/1978	1,080	
09/02/1967	950	
03/01/1991	939	
07/22/1986	906	
02/28/1991	844	

100-yr = 27,600 cfs

25-yr = 12,100 cfs

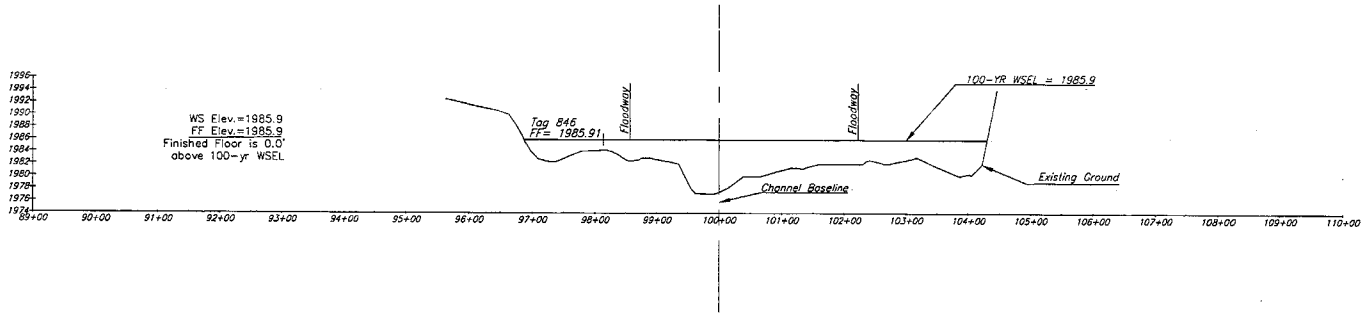
10-yr = 6,120 cfs

5-yr = 3,230 cfs

2-yr = 960 cfs

29

House



NO.	REVISIONS	DATE	BY	CHK.

XS845.DWG

TETRA TECH, INC.
INFRASTRUCTURE SOUTHWEST GROUP
501 North 44th Street, Suite 125, Phoenix, AZ 85008
(602) 629-1100 FAX (602) 629-1186

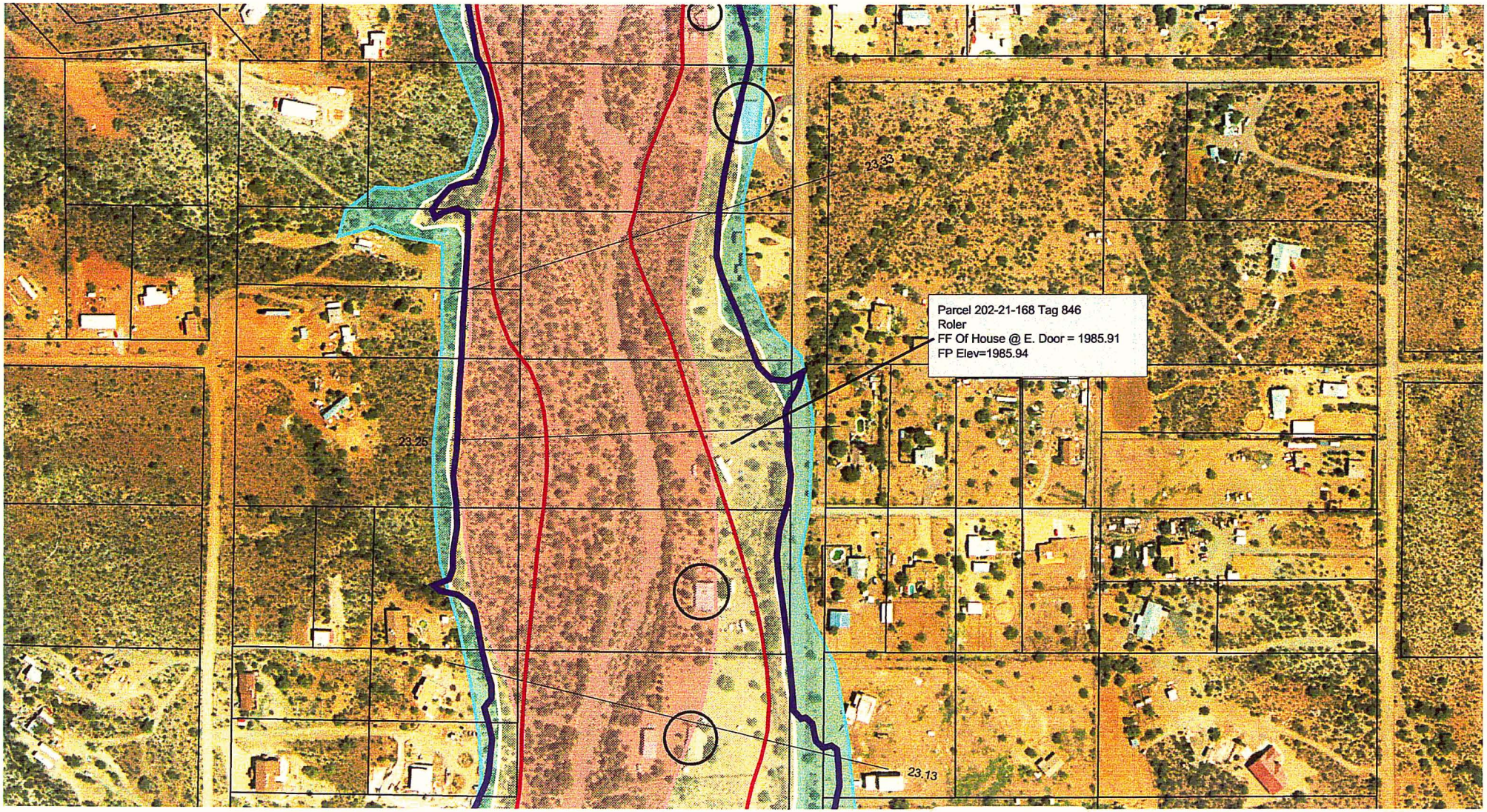
SKUNK CREEK PHASE II

WATERCOURSE MASTER PLAN

JOB NO.	2350.0002
DESIGNED BY:	LML
DRAWN BY:	LML
CHECKED BY:	TRL
APPROVED BY:	TRL
DATE:	

STRUCTURE CROSS SECTIONS
Owner: ROLER
Cross Section: 29

SCALE: HORIZ: 1"= 200'
CONT. INTERVAL =
DRAWING NO.
SHEET NO. OF:



LEGEND

- Severe Erosion Hazard Zone
- Lateral Migration Erosion Hazard Zone
- Long Term Erosion Hazard Zone
- Floodplain
- Floodway

N

Scale: 1"=200'

TETRA TECH, INC.
INFRASTRUCTURE SOUTHWEST GROUP
301 North 44th Street, Suite 125, Phoenix, AZ 85008
(602) 629-1100 FAX (602) 629-1188

Parcel 202-21-175

Home Owner: Jim and Constance Maynard
Meeting Date: April 9, 2001
Meeting Location: Maynard Residence on N. 7th Avenue, New River, AZ

In Attendance:

Mr. Jim Maynard
Mr. Doug Williams, FCDMC
Mr. Tom Loomis, Tetra Tech, Inc.

Handout Materials:

1. Floodplain Status Information Sheet. This 1-page sheet lists information about structures on the property in question. It includes:

   - The FEMA 100-year peak discharge and estimated water surface elevation at each structure.
   - Whether or not the structure is within the FEMA 100-year Floodway.
   - Which Erosion Hazard Zone the structure is within.
   - A written description of what the findings mean.

2. A 200-scale color aerial photograph of the Maynard's property and adjacent parcels. The FEMA 100-year Floodplain and Floodway are shown as blue and red lines, respectively. The Erosion Hazard Zones defined under the WCMP are shown as areas shaded in red (severe zone), yellow (lateral migration zone), and green (long-term zone). The FEMA 100-year water surface elevation at their house is listed.

3. A 200-scale cross section of Skunk Creek taken through each structure listed on the Floodplain Status Information Sheet. The profile of the ground using the topography from the 1997 flood insurance study of Skunk Creek is shown, as well as the location of the structure, the limits of the FEMA 100-year Floodway, and the FEMA 100-year water surface elevation.

4. A table listing of peak flow data for Skunk Creek at the USGS Flow Gage at the Skunk Creek crossing of Interstate 17, including approximate return frequencies.

5. A copy of the Maricopa County Floodplain Regulations.

Meeting Results:

Doug opened by presenting the goals of the Skunk Creek Watercourse Master Plan (WCMP) and informing Mr. Maynard that his home on Assessor's Parcel 202-21-175 is located outside the FEMA 100-year Floodplain and the lateral migration erosion hazard zone. The home does lie partially within the long-term erosion hazard zone. Doug expressed that the purpose of this meeting was informational, intended to inform Mr. Maynard of the flood and erosion hazards present on the property where he resides. His home is outside the flood and erosion hazard area, but over 76% of his property lies within the FEMA 100-year Floodplain, and the severe and lateral migration erosion hazard zones. These hazards have been identified during the WCMP preparation. Doug explained that we are meeting with him at his request. Other

individual meetings have been held with some of the Maynard's neighbor's at Flood Control District request because their homes are within the FEMA 100-year Floodway.

Tom explained the basics of the Federal Emergency Management Agency (FEMA) National Flood Insurance Program and the differences between the 100-year floodplain and floodway. The concept of a 100-year flood being a flood that has 1% chance of occurring in any given year was explained. The 100-year floodplain was defined as the area subject to being covered by floodwater during a 1% flood. The 100-year floodway was described as a regulatory area reserved for the flow of waters, and as a very hazardous, life-threatening area because of the high depth and velocity of flow. The concept of "squeezing in" the floodplain limits to the floodway limits was described, as was the effects of such floodplain encroachments on velocity, peak discharge and downstream improvements.

Tom described the Erosion Hazard Zones that were prepared as part of the WCMP. The severe erosion hazard zone was described as the area subject to erosion during a large flood, such as the 1% flood. The lateral migration erosion hazard zone was described as the area subject to erosion from a typical series of floods over a 60-year period, including the erosion resulting from a large flood, such as the 1% flood. The long-term erosion hazard zone was described as the area expected to be subject to erosion over a much longer period of time, from 60- to 1,000-years. It is the area that geologic evidence shows Skunk Creek has occupied in the past 60- to 1000-years.

Tom then described the three alternatives that are being analyzed as a part of the WCMP. The full-structural alternative was described as implementation of the existing regulations. If encroachment is allowed to continue to occur, then levees and bank protection will be necessary to protect the improvements made within the floodplain. It was explained that this option is very expensive to the public, and that it results in increases in peak discharge downstream because of the loss of over bank storage and increases in flow depths and velocity. The effects of this alternative on the Maynard's home were explained. Implementation would result in levees being constructed on their property, but their existing home would be outside the east levee. It was explained that if this alternative were selected, the area outside the FEMA 100-year Floodway would be buildable, but that this alternative was very expensive and would result in severe public safety issues and expenditure of public funds downstream of the study area.

The nonstructural alternative was described as not allowing any encroachment within the 100-year floodplain or the long-term erosion hazard zone. This is the maximum area the wash needs to function naturally. Implementation would require buying property that is outside the 100-year floodplain and the lateral migration erosion hazard zone. The homes that are in the floodway would possibly be included in a voluntary buy-out program. The impact on the Maynard's property is that an additional 0.5 acres of his parcel would be restricted from future building.

The low-impact structural alternative was described as limiting floodplain encroachment to the lateral migration erosion hazard zone boundary. This is the minimum area the wash needs to function naturally. This alternative results in minimal increases in flow depth and velocity and can be implemented without the construction of levees in most areas. The impact on the Maynard's property would be that no building would be allowed in this zone, an area of about 0.7 acres.

Tom explained that a flood warning system for existing homes in the area was being considered. The meeting lasted about 45 minutes.

Skunk Creek Watercourse Master Plan, Phase II

Floodplain Status Information Sheet

Parcel Number: 202-21-175
Owner: Maynard
Address:

Phone:

Project Tag ID # 853

Structure	House		
Cross Section #	30		
Approximate River Mile	23.30		
Existing Condition 100-yr Flow [cfs]	24,400		
Existing Condition 100-yr Water Surface Elevation [ft]	1990.4*		
Finished Floor Elevation (FFE) [ft]	not surveyed		
Depth of Water Above Finished Floor [ft]	---		
Flow Required to Reach FFE [cfs] (for mobile homes, flow required to reach ground underneath home)	---		
Approx. Storm Return Interval Required to Reach FFE (or ground beneath mobile homes)	>100-yr		
Is Structure Within Floodway?	No		
Erosion Hazard Zone	Long Term		

* Water surface elevation was interpolated between HEC-RAS model cross sections

Summary of Findings

The house on this parcel is outside the FEMA 100-year floodplain.

The house is located within the Long Term Erosion Hazard Zone. The danger of erosion in this zone is less than in the Severe or Lateral Migration Erosion Hazard Zones, but could occur at some point over the next 60 to 1,000 years.

US GEOLOGICAL SURVEY
SKUNK CREEK PEAK FLOW DATA

Station name: Skunk Creek Near Phoenix, Ariz.

Station number: 09513860

Location: On right bank dike of Skunk Creek flood control channel, 300 ft east of frontage road of Interstate Highway 17, 3 mi north of Adobe and 20 mi north of City Hall in Phoenix. Lat 33°43'45", Long 112°07'09", in NW1/4SE1/4SE1/4 sec.35, T.5 N., R.2 E., Maricopa County, Hydrologic Unit 15070102.

Water Years Retrieved: 1959 through 1999

Date	Discharge [cfs]	Approximate Return Frequency
---	---	
---	---	
---	---	
08/01/1964	11,500	23-yr
09/05/1970	9,650	18-yr
12/25/1959	9,400	17-yr
08/12/1990	8,160	14-yr
08/23/1992	7,020	11-yr
11/30/1982	6,170	10-yr
12/19/1967	5,900	
01/08/1993	4,990	
08/21/1971	4,770	
10/06/1972	4,700	
08/19/1970	4,460	
03/01/1978	3,590	
10/10/1986	3,440	
02/28/1978	3,380	
08/17/1971	3,260	
01/11/1993	3,160	
07/24/1990	3,110	
08/15/1990	2,900	
07/15/1999	2,620	
11/08/1982	2,570	
07/17/1972	2,380	
01/17/1978	2,340	
11/01/1987	2,250	
08/30/1988	2,200	
12/10/1982	2,180	
09/03/1990	2,090	
12/01/1982	1,730	
07/14/1999	1,690	
12/23/1982	1,460	
10/19/1972	1,420	
01/26/1985	1,320	
08/11/1991	1,250	
10/11/1986	1,250	
02/20/1980	1,210	
02/09/1993	1,170	
12/19/1991	1,140	
02/13/1978	1,080	
09/02/1967	950	
03/01/1991	939	
07/22/1986	906	
02/28/1991	844	

100-yr = 27,600 cfs

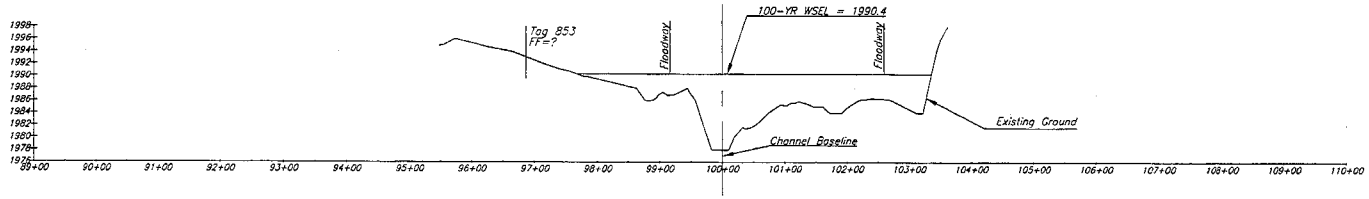
25-yr = 12,100 cfs

10-yr = 6,120 cfs

5-yr = 3,230 cfs

2-yr = 960 cfs

30
House



NO.	REVISIONS	DATE	BY	CHK.

XS853.DWG

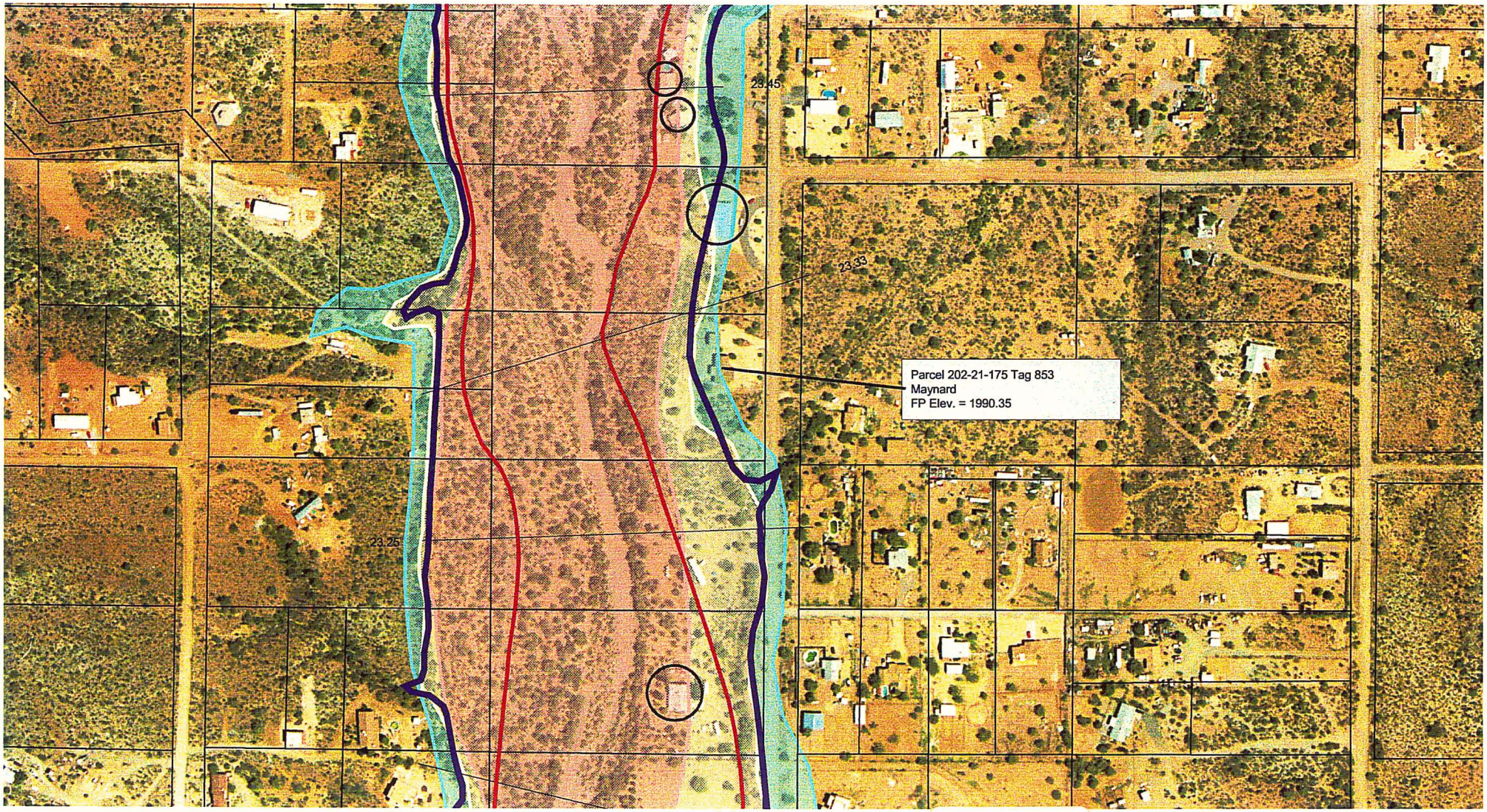
TETRA TECH, INC.
INFRASTRUCTURE SOUTHWEST GROUP
501 North 44th Street, Suite 125, Phoenix, AZ 85008
(602) 629-1100 FAX (602) 629-1186

SKUNK CREEK PHASE II
WATERCOURSE MASTER PLAN

JOB NO.	2350.0002
DESIGNED BY:	LML
DRAWN BY:	LML
CHECKED BY:	TRL
APPROVED BY:	TRL
DATE:	

STRUCTURE CROSS SECTIONS
Owner: MAYNARD
Cross Section: 30

SCALE: HORIZ: 1" = 200'
CONT. INTERVAL =
DRAWING NO.
SHEET NO. OF:



LEGEND

- Severe Erosion Hazard Zone
- Lateral Migration Erosion Hazard Zone
- Long Term Erosion Hazard Zone
- Floodplain
- Floodway

N

Scale: 1"=200'

TETRA TECH, INC
INFRASTRUCTURE ENVIRONMENT WATER
501 North 44th Street, Suite 125, Phoenix, AZ 85008
(602) 629-1100 FAX (602) 629-1186

Appendix H

Letters to Property Owners

FLOOD CONTROL DISTRICT
of
Maricopa County

2801 West Durango Street • Phoenix, Arizona 85009-6399
Telephone (602) 506-1501
Fax (602) 506-4601
TT (602) 506-5897

BOARD OF DIRECTORS
Jan Brewer
Fulton Brock
Andrew Kunasek
Don Stapley
Mary Rose Garrido Wilcox

August 6, 2001

Mr. and Mrs. Daniel and Kathleen Albert
42745 North 7th Avenue
New River, AZ 85087

Dear Mr. and Mrs. Albert,

Thank you for taking the time to meet with us in March regarding our Skunk Creek Watercourse Master Plan Study and your property near Skunk Creek. At that time we provided you with several items including a Floodplain Status Information Sheet, an aerial photograph, a cross-section plot (all specific to your parcel), and stream flow data for Skunk Creek. We also discussed floodplains, floodways, and erosion hazard zones.

Since that time we have updated the Floodplain Status Information Sheets. In addition, we have been unable to contact some of your neighbors in the floodway and/or Severe Erosion Hazard Zone. It is important that all homeowners living in these high hazard areas are provided with as much accurate information as possible regarding their property and the associated hazards, so we are sending this certified mailing to ensure all homeowners are provided the same information and are afforded the same opportunity to discuss these issues with us.

You will find the information provided in the letter is the same as that presented to you during our March visit. We have, however, included the updated Floodplain Status Information Sheet for your information.

As always, if you have any questions, or would like further information, don't hesitate to contact me.

Sincerely,

Marilyn DeRosa, RG
Planning Project Manager

enclosures

FLOOD CONTROL DISTRICT
of
Maricopa County

2801 West Durango Street • Phoenix, Arizona 85009-6399
Telephone (602) 506-1501
Fax (602) 506-4601
TT (602) 506-5897

BOARD OF DIRECTORS
Jan Brewer
Fulton Brock
Andrew Kunasek
Don Stapley
Mary Rose Garrido Wilcox

August 6, 2001

Mr. and Mrs. Daniel and Kathleen Albert
42745 North 7th Avenue
New River, AZ 85087

Dear Skunk Creek Property Owner,

I am writing to you as a representative of the Flood Control District of Maricopa County (District). I am the Project Manager for the Skunk Creek Watercourse Master Plan project currently in progress. Your home has been identified as being located within the regulatory *floodway* and/or the *Severe Erosion Hazard Zone* of Skunk Creek, either wholly or in part.

The *floodway* is defined by the Federal Emergency Management Agency (FEMA) as an area that is reserved for conveyance of floodwaters. It is usually a smaller area than the *floodplain*, which is the entire area that is flooded as a result of a 100-year storm. A 100-year storm is one that has a 1% chance of occurring or being exceeded in any given year. During extreme rainfall events, such as the 100-year storm, the *floodway* carries most of the flow in the stream. This makes it a high hazard area, where the safety of residents is threatened, in addition to the possibility of significant structural damage.

In addition to flood hazards, we have also identified three *erosion hazard zones,* which are shown on the aerial photograph. In desert washes such as Skunk Creek, a single major storm can result in significant bank erosion along the channel and undermine the foundations of nearby structures. *The Severe Erosion Hazard Zone* defines the area most likely to be eroded during a single major event, such as the 100-year flood. The area within the *Lateral Migration Erosion Hazard Zone* is the area likely to be eroded by a series of "typical" floods over the next 60 years, including a single major event such as the 100-year flood. It is representative of the area subject to lateral movement of the main channel of Skunk Creek. The *Long-Term Erosion Hazard Zone* includes the area that shows geological evidence of channel movement over the past 60 to 1,000 years, and represents the area of potential channel movement over the next 60 to 1,000 years in the future.

The *Severe Erosion Hazard Zone* and the *Lateral Migration Erosion Hazard Zones* are new regulatory areas, under the administration of the Flood Control District of Maricopa County, similar to the 100-year *floodway*. The *Long-Term Erosion Hazard Zone* is not a regulatory area. It is provided for information only.

We have been meeting with other property owners with homes located within the *floodway* and/or *Severe Erosion Hazard Zone* who responded to previous mailings or attended a public meeting that was held in the area. During the meetings, we review *floodway* hazard information specific to each property. The purpose of this mailing is to provide you with the same information concerning your property.

Included in this packet you will find:

1) A Floodplain Status Information Sheet for your parcel of land, identified by Maricopa County Assessor Parcel Number.
2) An aerial photograph of your property taken in May 1999.
3) A cross section plot of Skunk Creek taken through your home or other structure on your property.
4) A Skunk Creek Peak Flow Data sheet for a stream flow gage at the Skunk Creek crossing of Interstate 17.

The Floodplain Status Information Sheets list the flooding and erosion hazard status of each significant structure on your property. The depth of flooding in the structure is shown for the 100-year flood, as well as an estimate of the amount of flow it would take in Skunk Creek to start flooding the structure. In some cases, this is much less than a 100-year flood. The aerial photograph shows the boundaries of the 100-year *floodway* and *floodplain* relative to your property.

The cross section plot shows the location and elevation of significant structures on your property relative to the Skunk Creek channel. The water depth during the 100-year flood is also shown.

The Skunk Creek Peak Flow Data sheet shows the historical record of high flows in Skunk Creek from 1959 through 1999. This data was recorded by the U.S. Geological Survey at a monitoring station just east of I-17. For comparison, the peak flows for the 100-year, 25-year, 10-year, 5-year, and 2-year storms are also shown. The highest flow recorded in Skunk Creek during this time period is less than a 25-year flood, or a flood that has a 4% probability of occurring or being exceeded in any given year.

In our meeting with other homeowners who also have homes within the 100-year *floodway*, we discussed Tropical Storm Nora, which occurred in September 1997. Nora produced rainfall amounts in excess of the 4.6-inch 100-year precipitation amount for the Skunk Creek watershed. Nora produced rainfall amounts as high as 12 inches on top of Harquahala Mountain. If Nora had moved just a few more miles east, it would have hit the Skunk Creek watershed, and likely resulted in a 100-year flood on Skunk Creek. These storm events can and do happen in our area.

As part of the Skunk Creek Watercourse Master Plan, the District is preparing a Flood Warning Plan to appraise residents along Skunk Creek of impending dangers from potential floods. You will receive more information regarding the flood warning program in the future. We are also considering recommendation of a possible voluntary acquisition program for homes situated within the 100-year *floodway* and/or the *Severe Erosion Hazard Zone.*

If approved by the Flood Control Advisory Board and the Maricopa County Board of Supervisors, homeowners would be given the choice of staying where they are or selling the property for fair market value. Under an acquisition scenario, the District would then demolish structures on the property and return it to as close to natural conditions as possible.

We would be happy to meet with you to discuss the information presented in this packet, or any other concerns you may have concerning flood and erosion hazards to your property. If you would like to schedule a meeting, or have any other questions, please call.

Sincerely,

Marilyn DeRosa, RG
Planning Project Manager

enclosures

Floodplain Status Information Sheet

Parcel Number: 202-21-024B
Owner: Albert
Address: 42745 N. 7th Ave.
New River, AZ 85087
Phone: (623) 465-5971

Project Tag ID # 616

Structure	House	Garage	
Cross Section #	16	17	
Approximate River Mile	22.95	22.96	
Existing Condition 100-yr Flow [cfs]	24,400	24,400	
Existing Condition 100-yr Water Surface Elevation [ft]	1973.4	1974.3	
Finished Floor Elevation (FFE) [ft]	1971.4	1971.4	
Depth of Water Above Finished Floor [ft]	2.0	2.9	
Flow Required to Reach FFE [cfs] (for mobile homes, flow required to reach ground underneath home)	12,200	7,400	
Approx. Storm Return Interval Required to Reach FFE (from USGS Skunk Creek stream gage data)	30-yr	15-yr	
Approx. Storm Return Interval Required to Reach FFE (from site-specific model data)	13-yr	5-yr	
Is Structure Within Floodway?	Yes	Yes	
Erosion Hazard Zone	Severe	Severe	

Summary of Findings

Both structures on this parcel are subject to flooding and are located within the FEMA 100-year floodway. During the 100-year flood, there would be approximately 1' 11" of water in the house. Lower frequency storms would also cause flooding problems. For the house, the 13-year storm, which has approximately a 8% probability of occuring or being exceeded in any given year, would reach the finished floor elevation. For the garage, the 5-year storm, which has approximately a 20% probability of occuring or being exceeded in any given year, would reach the finished floor elevation.

Both structures are located within the Severe Erosion Hazard Zone. This zone is comprised of the active watercourse channels and adjacent areas likely to be eroded during a single major event, such as the 100-year flood.

FLOOD CONTROL DISTRICT
of
Maricopa County

2801 West Durango Street • Phoenix, Arizona 85009-6399
Telephone (602) 506-1501
Fax (602) 506-4601
TT (602) 506-5897

BOARD OF DIRECTORS
Jan Brewer
Fulton Brock
Andrew Kunasek
Don Stapley
Mary Rose Garrido Wilcox

August 6, 2001

Mr. Carl Birdsell
11156 West Mountain View Road
Sun City, AZ 85381

Dear Skunk Creek Property Owner,

I am writing to you as a representative of the Flood Control District of Maricopa County (District). I am the Project Manager for the Skunk Creek Watercourse Master Plan project currently in progress. Your home has been identified as being located within the regulatory *floodway* and/or the *Severe Erosion Hazard Zone* of Skunk Creek, either wholly or in part.

The *floodway* is defined by the Federal Emergency Management Agency (FEMA) as an area that is reserved for conveyance of floodwaters. It is usually a smaller area than the *floodplain*, which is the entire area that is flooded as a result of a 100-year storm. A 100-year storm is one that has a 1% chance of occurring or being exceeded in any given year. During extreme rainfall events, such as the 100-year storm, the *floodway* carries most of the flow in the stream. This makes it a high hazard area, where the safety of residents is threatened, in addition to the possibility of significant structural damage.

In addition to flood hazards, we have also identified three *erosion hazard zones,* which are shown on the aerial photograph. In desert washes such as Skunk Creek, a single major storm can result in significant bank erosion along the channel and undermine the foundations of nearby structures. *The Severe Erosion Hazard Zone* defines the area most likely to be eroded during a single major event, such as the 100-year flood. The area within the *Lateral Migration Erosion Hazard Zone* is the area likely to be eroded by a series of "typical" floods over the next 60 years, including a single major event such as the 100-year flood. It is representative of the area subject to lateral movement of the main channel of Skunk Creek. The *Long-Term Erosion Hazard Zone* includes the area that shows geological evidence of channel movement over the past 60 to 1,000 years, and represents the area of potential channel movement over the next 60 to 1,000 years in the future.

The *Severe Erosion Hazard Zone* and the *Lateral Migration Erosion Hazard Zones* are new regulatory areas, under the administration of the Flood Control District of Maricopa County, similar to the 100-year *floodway*. The *Long-Term Erosion Hazard Zone* is not a regulatory area. It is provided for information only.

We have been meeting with other property owners with homes located within the *floodway* and/or *Severe Erosion Hazard Zone* who responded to previous mailings or attended a public meeting that was held in the area. During the meetings, we review *floodway* hazard information specific to each property. The purpose of this mailing is to provide you with the same information concerning your property.

Included in this packet you will find:

1) A Floodplain Status Information Sheet for your parcel of land, identified by Maricopa County Assessor Parcel Number.
2) An aerial photograph of your property taken in May 1999.
3) A cross section plot of Skunk Creek taken through your home or other structure on your property.
4) A Skunk Creek Peak Flow Data sheet for a stream flow gage at the Skunk Creek crossing of Interstate 17.

The Floodplain Status Information Sheets list the flooding and erosion hazard status of each significant structure on your property. The depth of flooding in the structure is shown for the 100-year flood, as well as an estimate of the amount of flow it would take in Skunk Creek to start flooding the structure. In some cases, this is much less than a 100-year flood. The aerial photograph shows the boundaries of the 100-year *floodway* and *floodplain* relative to your property.

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The Skunk Creek Peak Flow Data sheet shows the historical record of high flows in Skunk Creek from 1959 through 1999. This data was recorded by the U.S. Geological Survey at a monitoring station just east of I-17. For comparison, the peak flows for the 100-year, 25-year, 10-year, 5-year, and 2-year storms are also shown. The highest flow recorded in Skunk Creek during this time period is less than a 25-year flood, or a flood that has a 4% probability of occurring or being exceeded in any given year.

In our meeting with other homeowners who also have homes within the 100-year *floodway*, we discussed Tropical Storm Nora, which occurred in September 1997. Nora produced rainfall amounts in excess of the 4.6-inch 100-year precipitation amount for the Skunk Creek watershed. Nora produced rainfall amounts as high as 12 inches on top of Harquahala Mountain. If Nora had moved just a few more miles east, it would have hit the Skunk Creek watershed, and likely resulted in a 100-year flood on Skunk Creek. These storm events can and do happen in our area.

As part of the Skunk Creek Watercourse Master Plan, the District is preparing a Flood Warning Plan to appraise residents along Skunk Creek of impending dangers from potential floods. You will receive more information regarding the flood warning program in the future. We are also considering recommendation of a possible voluntary acquisition program for homes situated within the 100-year *floodway* and/or the *Severe Erosion Hazard Zone*.

If approved by the Flood Control Advisory Board and the Maricopa County Board of Supervisors, homeowners would be given the choice of staying where they are or selling the property for fair market value. Under an acquisition scenario, the District would then demolish structures on the property and return it to as close to natural conditions as possible.

We would be happy to meet with you to discuss the information presented in this packet, or any other concerns you may have concerning flood and erosion hazards to your property. If you would like to schedule a meeting, or have any other questions, please call.

Sincerely,

Marilyn DeRosa, RG
Planning Project Manager

enclosures

Floodplain Status Information Sheet

Parcel Number: 211-50-016H
Owner: Birdsell
Address: 11156 W. Mountain View Drive
Sun City, AZ 85351
Phone:

Project Tag ID # 929

Structure	Mobile		
Cross Section #	32		
Approximate River Mile	20.41		
Existing Condition 100-yr Flow [cfs]	27,300		
Existing Condition 100-yr Water Surface Elevation [ft]	1837.2*		
Finished Floor Elevation (FFE) [ft]	not surveyed		
Depth of Water Above Finished Floor [ft]	---		
Flow Required to Reach FFE [cfs] (for mobile homes, flow required to reach ground underneath home)	25,000		
Approx. Storm Return Interval Required to Reach FFE (or ground beneath mobile homes)	71-yr		
Is Structure Within Floodway?	Yes		
Erosion Hazard Zone	Severe		

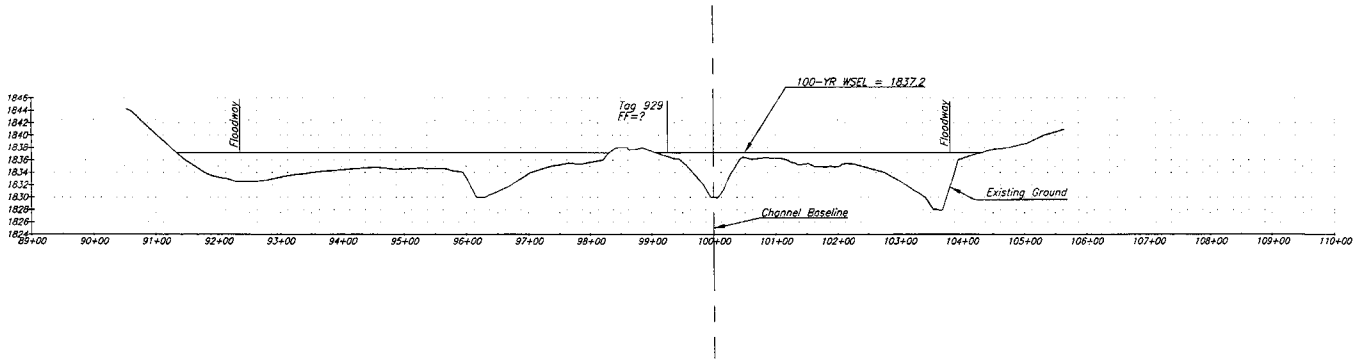
* Water surface elevation was interpolated between HEC-RAS model cross sections

Summary of Findings

The mobile home on this parcel is located within the FEMA 100-year floodway. It is unknown if the floodwater reaches the finished floor elevation in the 100-year flood, because the structure was not surveyed. However, for mobile homes, the floodwaters do not have to reach the finished floor elevation to pose a hazard to the structure. As soon as water flows underneath the home, there is a danger that the foundation piers could be undermined and subsequently fail. This condition occurs in a storm frequency as low as the 71-year storm, which has approximately a 1.4% probability of occuring or being exceeded in any given year.

The home is located within the Severe Erosion Hazard Zone. This zone is comprised of the active watercourse channels and adjacent areas likely to be eroded during a single major event, such as the 100-year flood.

32
Mobile



NO.	REVISIONS	DATE	BY	CHK.

XS929.DWG

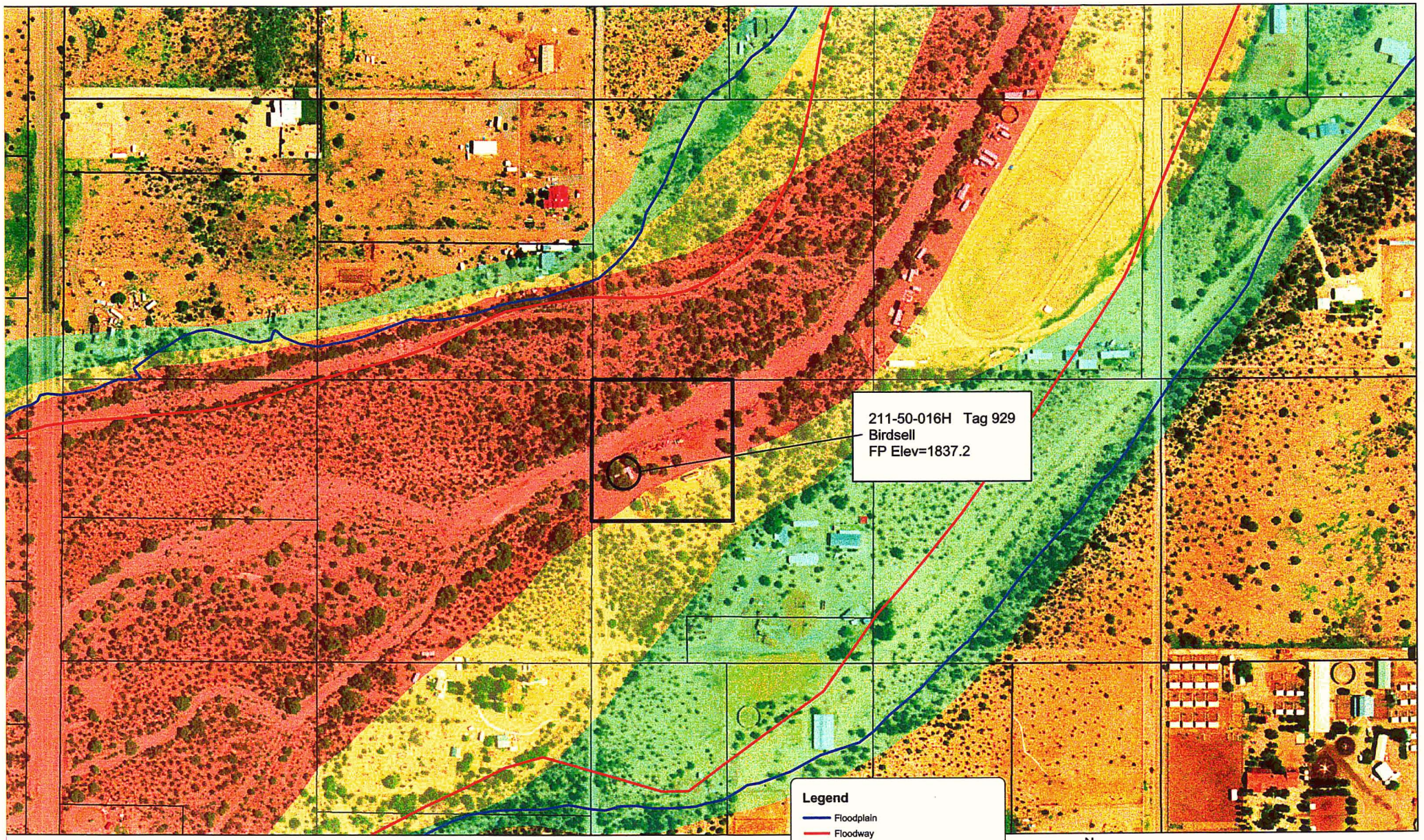
TETRA TECH, INC.
INFRASTRUCTURE SOUTHWEST GROUP
501 North 44th Street, Suite 125, Phoenix, AZ 85008
(602) 629-1100 FAX (602) 629-1186

SKUNK CREEK PHASE II
WATERCOURSE MASTER PLAN

JOB NO.	2350.0002
DESIGNED BY:	LML
DRAWN BY:	LML
CHECKED BY:	TRL
APPROVED BY:	TRL
DATE:	

STRUCTURE CROSS SECTION
Owner: BIRDSELL
Cross Section: 32

SCALE: HORIZ: 1" = 200'
CONT. INTERVAL =
DRAWING NO.
SHEET NO. OF:



Aerial Photo Date: 7/1999

Legend

- Floodplain
- Floodway
- Severe Erosion Hazard Zone
- Lateral Migration Erosion Hazard Zone
- Long Term Erosion Hazard Zone

N

Scale: 1"=200'

Tetra Tech, Inc.
Infrastructure Southwest Group
4801 East Washington Street Suite 260, Phoenix, Arizona 85034
(602) 683-3280 Fax: (602) 344-1164

FLOOD CONTROL DISTRICT
of
Maricopa County

2801 West Durango Street • Phoenix, Arizona 85009-6399
Telephone (602) 506-1501
Fax (602) 506-4601
TT (602) 506-5897

BOARD OF DIRECTORS
Jan Brewer
Fulton Brock
Andrew Kunasek
Don Stapley
Mary Rose Garrido Wilcox

August 6, 2001

Mr. and Mrs. David and Carol Caldwell
43750 North 3rd Avenue
New River, AZ 85087

Dear Skunk Creek Property Owner,

I am writing to you as a representative of the Flood Control District of Maricopa County (District). I am the Project Manager for the Skunk Creek Watercourse Master Plan project currently in progress. Your home has been identified as being located within the regulatory *floodway* and/or the *Severe Erosion Hazard Zone* of Skunk Creek, either wholly or in part.

The *floodway* is defined by the Federal Emergency Management Agency (FEMA) as an area that is reserved for conveyance of floodwaters. It is usually a smaller area than the *floodplain*, which is the entire area that is flooded as a result of a 100-year storm. A 100-year storm is one that has a 1% chance of occurring or being exceeded in any given year. During extreme rainfall events, such as the 100-year storm, the *floodway* carries most of the flow in the stream. This makes it a high hazard area, where the safety of residents is threatened, in addition to the possibility of significant structural damage.

In addition to flood hazards, we have also identified three *erosion hazard zones,* which are shown on the aerial photograph. In desert washes such as Skunk Creek, a single major storm can result in significant bank erosion along the channel and undermine the foundations of nearby structures. *The Severe Erosion Hazard Zone* defines the area most likely to be eroded during a single major event, such as the 100-year flood. The area within the *Lateral Migration Erosion Hazard Zone* is the area likely to be eroded by a series of "typical" floods over the next 60 years, including a single major event such as the 100-year flood. It is representative of the area subject to lateral movement of the main channel of Skunk Creek. The *Long-Term Erosion Hazard Zone* includes the area that shows geological evidence of channel movement over the past 60 to 1,000 years, and represents the area of potential channel movement over the next 60 to 1,000 years in the future.

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If approved by the Flood Control Advisory Board and the Maricopa County Board of Supervisors, homeowners would be given the choice of staying where they are or selling the property for fair market value. Under an acquisition scenario, the District would then demolish structures on the property and return it to as close to natural conditions as possible.

We would be happy to meet with you to discuss the information presented in this packet, or any other concerns you may have concerning flood and erosion hazards to your property. If you would like to schedule a meeting, or have any other questions, please call.

Sincerely,

MDeRosa

Marilyn DeRosa, RG
Planning Project Manager

enclosures

Floodplain Status Information Sheet

Parcel Number: 202-21-032A
Owner: Caldwell
Address: 43750 N. 3rd Ave.
New River, AZ 85087
Phone: (623) 465-7670

Project Tag ID # 647

Structure	House	Building	
Cross Section #	26	27	
Approximate River Mile	Cline 0.295	Cline 0.270	
Existing Condition 100-yr Flow [cfs]	16,700	16,700	
Existing Condition 100-yr Water Surface Elevation [ft]	2021.7*	2020.2*	
Finished Floor Elevation (FFE) [ft]	2021.4	2019.3	
Depth of Water Above Finished Floor [ft]	0.3	0.9	
Flow Required to Reach FFE [cfs] (for mobile homes, flow required to reach ground underneath home)	13,300	---	
Approx. Storm Return Interval Required to Reach FFE (from site-specific model data)	91-yr	---	
Is Structure Within Floodway?	Yes	Yes	
Erosion Hazard Zone	Long Term	Lateral Migration	

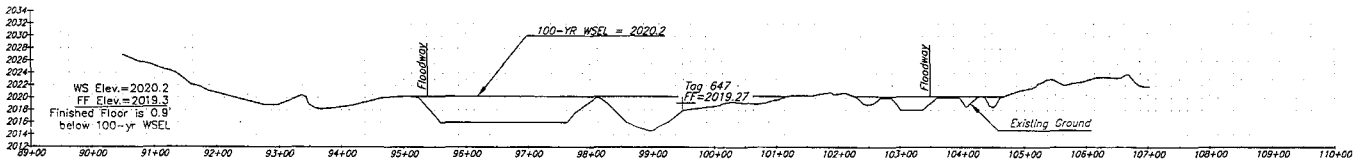
* Water surface elevation was interpolated between HEC-RAS model cross sections

Summary of Findings

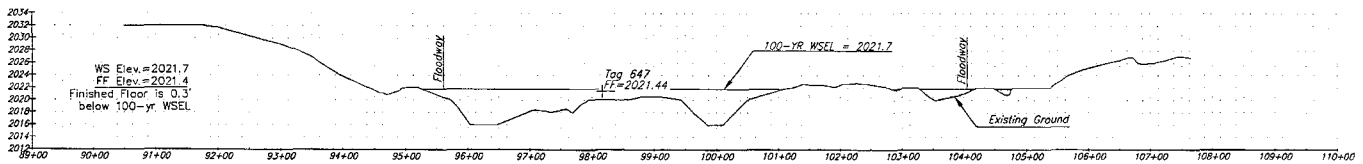
Both structures on this parcel are subject to flooding and are located within the FEMA 100-year floodway. During the 100-year flood, there would be approximately 11" of water in the house and 4" of water in the building. Lower frequency storms could also cause flooding problems in both structures.

The building is located within the Lateral Migration Erosion Hazard Zone. The danger of erosion in this zone is less than in the Severe Erosion Hazard Zone, but could occur at some point within the next 60 years. The house is located within the Long Term Erosion Hazard Zone. The danger of erosion in this zone is less than in the Severe or Lateral Migration Erosion Hazard Zones, but could occur at some point over the next 60 to 1,000 years.

27
Building



26
House



NO.	REVISIONS	DATE	BY	CHK.

XS647.DWG

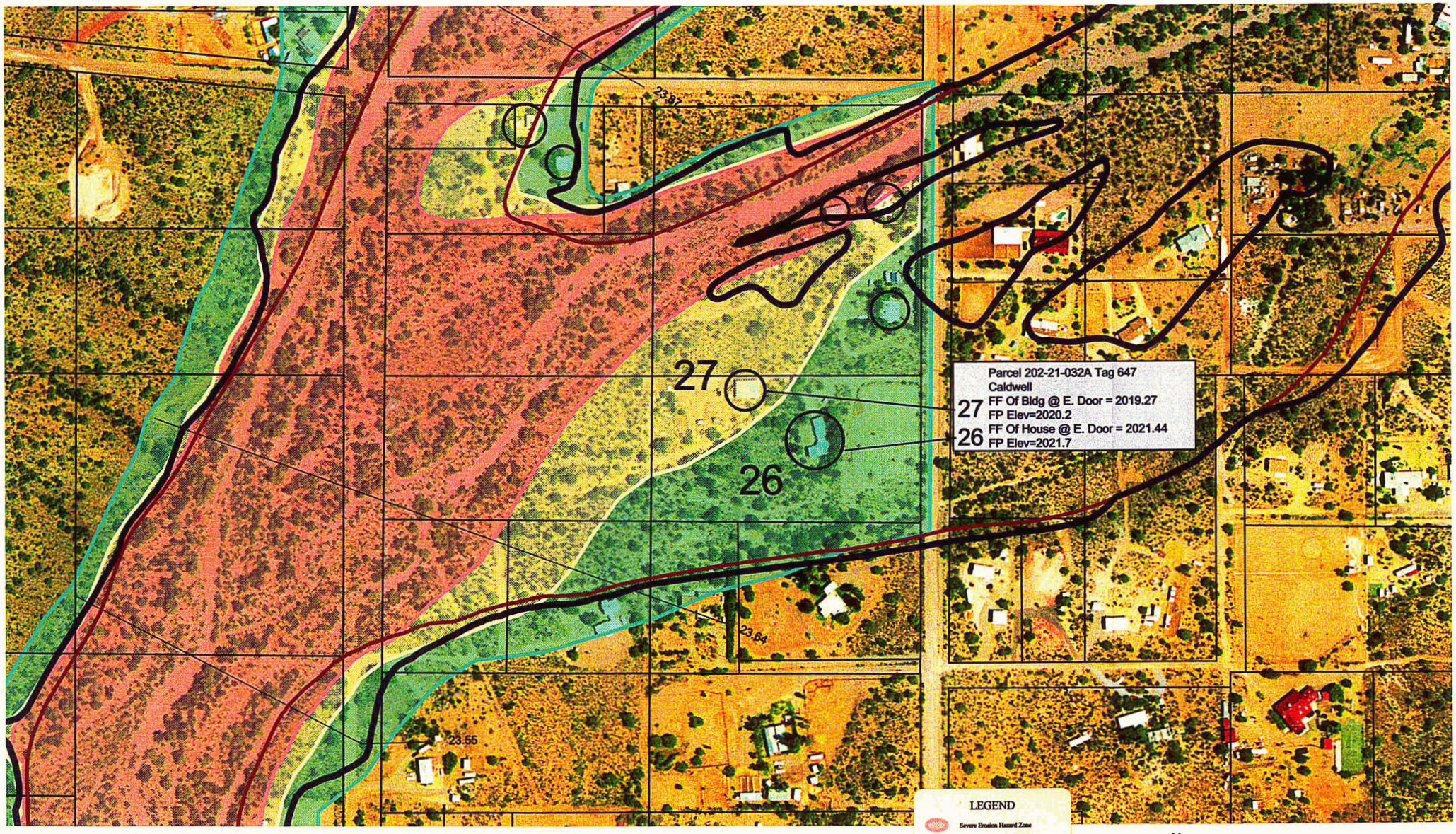
TETRA TECH, INC.
INFRASTRUCTURE SOUTHWEST GROUP
501 North 44th Street, Suite 125, Phoenix, AZ 85008
(602) 629-1100 FAX (602) 629-1188

SKUNK CREEK PHASE II
WATERCOURSE MASTER PLAN

JOB NO.	2350.0002
DESIGNED BY:	LML
DRAWN BY:	LML
CHECKED BY:	TRL
APPROVED BY:	TRL
DATE:	

STRUCTURE CROSS SECTIONS
Owner: CALDWELL
Cross Sections: 26, 27

SCALE: HORIZ: 1" = 200'
CONT. INTERVAL =
DRAWING NO.
SHEET NO. OF:



AERIAL PHOTO DATE: 7/1999

LEGEND

- Severe Erosion Hazard Zone
- Lateral Migration Erosion Hazard Zone
- Long Term Erosion Hazard Zone
- Floodplain
- Floodway

N

Scale: 1"=200'

TETRA TECH, INC
INFRASTRUCTURE SOUTHWEST GROUP
501 North 44th Street, Suite 125, Phoenix, AZ 85008
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Maricopa County

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BOARD OF DIRECTORS
Jan Brewer
Fulton Brock
Andrew Kunasek
Don Stapley
Mary Rose Garrido Wilcox

August 6, 2001

Ms. Jeanie Eller
42828 North 7th Avenue
New River, AZ 85087

Dear Ms. Eller,

Thank you for taking the time to meet with us in March regarding our Skunk Creek Watercourse Master Plan Study and your property near Skunk Creek. At that time we provided you with several items including a Floodplain Status Information Sheet, an aerial photograph, a cross-section plot (all specific to your parcel), and stream flow data for Skunk Creek. We also discussed floodplains, floodways, and erosion hazard zones.

Since that time we have updated the Floodplain Status Information Sheets. In addition, we have been unable to contact some of your neighbors in the floodway and/or Severe Erosion Hazard Zone. It is important that all homeowners living in these high hazard areas are provided with as much accurate information as possible regarding their property and the associated hazards, so we are sending this certified mailing to ensure all homeowners are provided the same information and are afforded the same opportunity to discuss these issues with us.

You will find the information provided in the letter is the same as that presented to you during our March visit. We have, however, included the updated Floodplain Status Information Sheet for your information.

As always, if you have any questions, or would like further information, don't hesitate to contact me.

Sincerely,

Marilyn DeRosa, RG
Planning Project Manager

enclosures

FLOOD CONTROL DISTRICT
of
Maricopa County

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August 6, 2001

Ms. Jeanie Eller
42828 North 7th Avenue
New River, AZ 85087

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In addition to flood hazards, we have also identified three *erosion hazard zones,* which are shown on the aerial photograph. In desert washes such as Skunk Creek, a single major storm can result in significant bank erosion along the channel and undermine the foundations of nearby structures. *The Severe Erosion Hazard Zone* defines the area most likely to be eroded during a single major event, such as the 100-year flood. The area within the *Lateral Migration Erosion Hazard Zone* is the area likely to be eroded by a series of "typical" floods over the next 60 years, including a single major event such as the 100-year flood. It is representative of the area subject to lateral movement of the main channel of Skunk Creek. The *Long-Term Erosion Hazard Zone* includes the area that shows geological evidence of channel movement over the past 60 to 1,000 years, and represents the area of potential channel movement over the next 60 to 1,000 years in the future.

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In our meeting with other homeowners who also have homes within the 100-year *floodway*, we discussed Tropical Storm Nora, which occurred in September 1997. Nora produced rainfall amounts in excess of the 4.6-inch 100-year precipitation amount for the Skunk Creek watershed. Nora produced rainfall amounts as high as 12 inches on top of Harquahala Mountain. If Nora had moved just a few more miles east, it would have hit the Skunk Creek watershed, and likely resulted in a 100-year flood on Skunk Creek. These storm events can and do happen in our area.

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If approved by the Flood Control Advisory Board and the Maricopa County Board of Supervisors, homeowners would be given the choice of staying where they are or selling the property for fair market value. Under an acquisition scenario, the District would then demolish structures on the property and return it to as close to natural conditions as possible.

We would be happy to meet with you to discuss the information presented in this packet, or any other concerns you may have concerning flood and erosion hazards to your property. If you would like to schedule a meeting, or have any other questions, please call.

Sincerely,

MDeRosa

Marilyn DeRosa, RG
Planning Project Manager

enclosures

FLOOD CONTROL DISTRICT
of
Maricopa County

2801 West Durango Street • Phoenix, Arizona 85009-6399
Telephone (602) 506-1501
Fax (602) 506-4601
TT (602) 506-5897

BOARD OF DIRECTORS
Jan Brewer
Fulton Brock
Andrew Kunasek
Don Stapley
Mary Rose Garrido Wilcox

August 6, 2001

Ms. Jeanie Eller
2102 East South Mountain Avenue
Phoenix, AZ 85040

Dear Ms. Eller,

Thank you for taking the time to meet with us in March regarding our Skunk Creek Watercourse Master Plan Study and your property near Skunk Creek. At that time we provided you with several items including a Floodplain Status Information Sheet, an aerial photograph, a cross-section plot (all specific to your parcel), and stream flow data for Skunk Creek. We also discussed floodplains, floodways, and erosion hazard zones.

Since that time we have updated the Floodplain Status Information Sheets. In addition, we have been unable to contact some of your neighbors in the floodway and/or Severe Erosion Hazard Zone. It is important that all homeowners living in these high hazard areas are provided with as much accurate information as possible regarding their property and the associated hazards, so we are sending this certified mailing to ensure all homeowners are provided the same information and are afforded the same opportunity to discuss these issues with us.

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In addition to flood hazards, we have also identified three *erosion hazard zones,* which are shown on the aerial photograph. In desert washes such as Skunk Creek, a single major storm can result in significant bank erosion along the channel and undermine the foundations of nearby structures. *The Severe Erosion Hazard Zone* defines the area most likely to be eroded during a single major event, such as the 100-year flood. The area within the *Lateral Migration Erosion Hazard Zone* is the area likely to be eroded by a series of "typical" floods over the next 60 years, including a single major event such as the 100-year flood. It is representative of the area subject to lateral movement of the main channel of Skunk Creek. The *Long-Term Erosion Hazard Zone* includes the area that shows geological evidence of channel movement over the past 60 to 1,000 years, and represents the area of potential channel movement over the next 60 to 1,000 years in the future.

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Included in this packet you will find:

1) A Floodplain Status Information Sheet for your parcel of land, identified by Maricopa County Assessor Parcel Number.
2) An aerial photograph of your property taken in May 1999.
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The Floodplain Status Information Sheets list the flooding and erosion hazard status of each significant structure on your property. The depth of flooding in the structure is shown for the 100-year flood, as well as an estimate of the amount of flow it would take in Skunk Creek to start flooding the structure. In some cases, this is much less than a 100-year flood. The aerial photograph shows the boundaries of the 100-year *floodway* and *floodplain* relative to your property.

The cross section plot shows the location and elevation of significant structures on your property relative to the Skunk Creek channel. The water depth during the 100-year flood is also shown.

The Skunk Creek Peak Flow Data sheet shows the historical record of high flows in Skunk Creek from 1959 through 1999. This data was recorded by the U.S. Geological Survey at a monitoring station just east of I-17. For comparison, the peak flows for the 100-year, 25-year, 10-year, 5-year, and 2-year storms are also shown. The highest flow recorded in Skunk Creek during this time period is less than a 25-year flood, or a flood that has a 4% probability of occurring or being exceeded in any given year.

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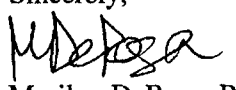
Sincerely,



Marilyn DeRosa, RG
Planning Project Manager

enclosures

Floodplain Status Information Sheet

Parcel Number: 202-21-013R
Owner: Eller
Address: 42828 N. 7th Ave.
New River, AZ 85087
Phone: (623) 465-0194

Project Tag ID # 585

Structure	House		
Cross Section #	18		
Approximate River Mile	23.12		
Existing Condition 100-yr Flow [cfs]	24,400		
Existing Condition 100-yr Water Surface Elevation [ft]	1980.2		
Finished Floor Elevation (FFE) [ft]	1979.3		
Depth of Water Above Finished Floor [ft]	0.9		
Flow Required to Reach FFE [cfs] (for mobile homes, flow required to reach ground underneath home)	18,000		
Approx. Storm Return Interval Required to Reach FFE (from USGS Skunk Creek stream gage data)	56-yr		
Approx. Storm Return Interval Required to Reach FFE (from site-specific model data)	34-yr		
Is Structure Within Floodway?	Yes		
Erosion Hazard Zone	Lateral Migration		

Summary of Findings

The house on this parcel is subject to flooding and is located within the FEMA 100-year floodway. During the 100-year flood, there would be approximately 11 inches of water in the house. Lower frequency storms would also cause flooding problems. The 34-year storm, which has approximately a 3% probability of occuring or being exceeded in any given year, would reach the finished floor elevation.

The house on this parcel is located within the Lateral Migration Erosion Hazard Zone. The danger of erosion in this zone is less than in the Severe Erosion Hazard Zone, but could occur at some point within the next 60 years.

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BOARD OF DIRECTORS
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Fulton Brock
Andrew Kunasek
Don Stapley
Mary Rose Garrido Wilcox

August 6, 2001

Mr. and Mrs. Bradley and Donna Funk
43426 North 7th Avenue
New River, AZ 85087

Dear Skunk Creek Property Owner,

I am writing to you as a representative of the Flood Control District of Maricopa County (District). I am the Project Manager for the Skunk Creek Watercourse Master Plan project currently in progress. Your home has been identified as being located within the regulatory *floodway* and/or the *Severe Erosion Hazard Zone* of Skunk Creek, either wholly or in part.

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In addition to flood hazards, we have also identified three *erosion hazard zones,* which are shown on the aerial photograph. In desert washes such as Skunk Creek, a single major storm can result in significant bank erosion along the channel and undermine the foundations of nearby structures. *The Severe Erosion Hazard Zone* defines the area most likely to be eroded during a single major event, such as the 100-year flood. The area within the *Lateral Migration Erosion Hazard Zone* is the area likely to be eroded by a series of "typical" floods over the next 60 years, including a single major event such as the 100-year flood. It is representative of the area subject to lateral movement of the main channel of Skunk Creek. The *Long-Term Erosion Hazard Zone* includes the area that shows geological evidence of channel movement over the past 60 to 1,000 years, and represents the area of potential channel movement over the next 60 to 1,000 years in the future.

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2) An aerial photograph of your property taken in May 1999.
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Sincerely,

MDeRosa

Marilyn DeRosa, RG
Planning Project Manager

enclosures

Floodplain Status Information Sheet

Parcel Number: 202-21-013M
Owner: Funk
Address: 43426 N. 7th Ave.
New River, AZ 85087
Phone:

Project Tag ID # 584

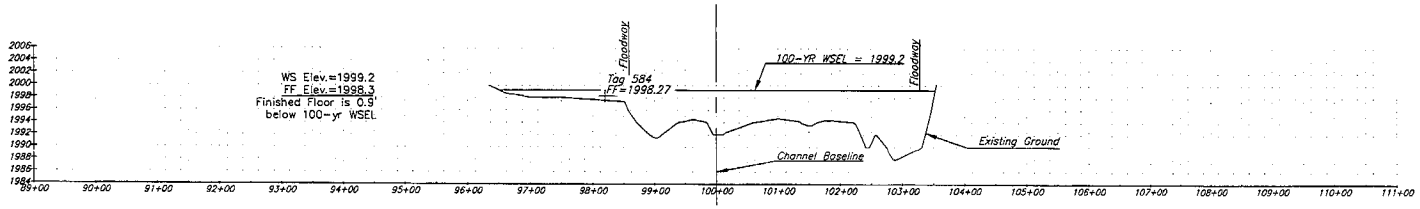
Structure	House	Garage	
Cross Section #	21	22	
Approximate River Mile	23.44	23.46	
Existing Condition 100-yr Flow [cfs]	24,400	24,400	
Existing Condition 100-yr Water Surface Elevation [ft]	1997.4	1999.2	
Finished Floor Elevation (FFE) [ft]	1996.6	1998.3	
Depth of Water Above Finished Floor [ft]	0.8	0.9	
Flow Required to Reach FFE [cfs] (for mobile homes, flow required to reach ground underneath home)	19,000	19,400	
Approx. Storm Return Interval Required to Reach FFE (from USGS Skunk Creek stream gage data)	63-yr	67-yr	
Approx. Storm Return Interval Required to Reach FFE (from site-specific model data)	42-yr	45-yr	
Is Structure Within Floodway?	No	No	
Erosion Hazard Zone	Severe	Severe	

Summary of Findings

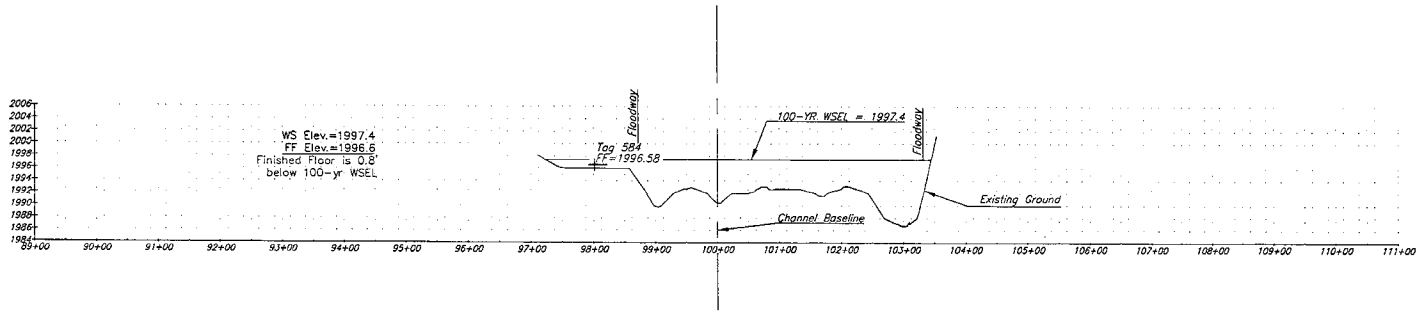
The structures on this parcel are located within the FEMA 100-year floodplain, but outside of the floodway. Both structures are subject to flooding during the 100-year storm. During the 100-year flood, there would be approximately 10 inches of water in the house. Lower frequency storms would also cause flooding problems. For the house, the 42-year storm, which has approximately a 3% probability of occuring or being exceeded in any given year, would reach the finished floor elevation.

Both structures are located within the Severe Erosion Hazard Zone. This zone is comprised of the active watercourse channels and adjacent areas likely to be eroded during a single major event, such as the 100-year flood.

22
Garage



21
House



NO.	REVISIONS	DATE	BY	CHK.

XS584.DWG

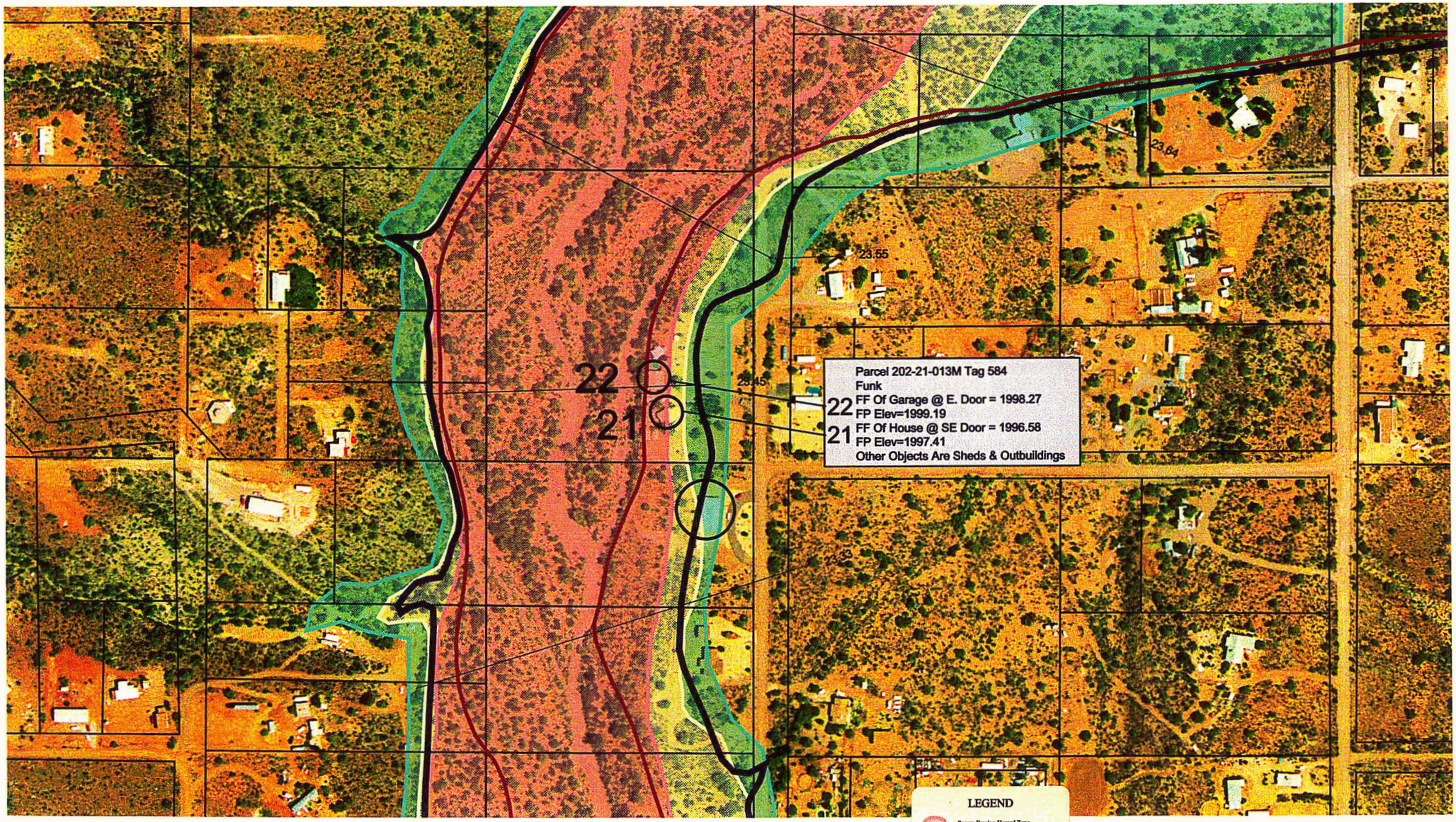
TETRA TECH, INC.
INFRASTRUCTURE SOUTHWEST GROUP
501 North 44th Street, Suite 125, Phoenix, AZ 85008
(602) 629-1100 FAX (602) 629-1186

SKUNK CREEK PHASE II
WATERCOURSE MASTER PLAN

JOB NO.	2350.0002
DESIGNED BY:	LML
DRAWN BY:	LML
CHECKED BY:	TRL
APPROVED BY:	TRL
DATE:	

STRUCTURE CROSS SECTIONS
Owner: FUNK
Cross Sections: 21, 22

SCALE: HORIZ: 1" = 200'
CONT. INTERVAL =
DRAWING NO.
SHEET NO. OF:



AERIAL PHOTO DATE: 7/1999

N

Scale: 1"=200'

TETRA TECH, INC
INFRASTRUCTURE SOUTHWEST GROUP
[illegible]
(602) [illegible] FAX (602) [illegible]

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BOARD OF DIRECTORS
Jan Brewer
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Andrew Kunasek
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Mary Rose Garrido Wilcox

August 6, 2001

Ms. Sharon Geraci
705 West Honda Bow Road
New River, AZ 85086

Dear Ms. Geraci,

Thank you for taking the time to meet with us in March regarding our Skunk Creek Watercourse Master Plan Study and your property near Skunk Creek. At that time we provided you with several items including a Floodplain Status Information Sheet, an aerial photograph, a cross-section plot (all specific to your parcel), and stream flow data for Skunk Creek. We also discussed floodplains, floodways, and erosion hazard zones.

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Sincerely,

MDeRosa

Marilyn DeRosa, RG
Planning Project Manager

enclosures

Floodplain Status Information Sheet

Parcel Number: 211-22-002J
Owner: Geraci
Address: 705 W. Honda Bow Rd.
New River, AZ 85086
Phone: (623) 465-2687

Project Tag ID # 6

Structure	Mobile Home		
Cross Section #	12		
Approximate River Mile	22.87		
Existing Condition 100-yr Flow [cfs]	24,400		
Existing Condition 100-yr Water Surface Elevation [ft]	1965.4		
Finished Floor Elevation (FFE) [ft]	1965.4		
Depth of Water Above Finished Floor [ft]	0.0		
Flow Required to Reach FFE [cfs] (for mobile homes, flow required to reach ground underneath home)	13,500		
Approx. Storm Return Interval Required to Reach FFE (from USGS Skunk Creek stream gage data)	36-yr		
Approx. Storm Return Interval Required to Reach FFE (from site-specific model data)	16-yr		
Is Structure Within Floodway?	Yes		
Erosion Hazard Zone	Severe		

Summary of Findings

The mobile home on this parcel is located within the FEMA 100-year floodway. The floodwater reaches the finished floor elevation in the 100-year flood. However, for mobile homes, the floodwaters do not have to reach the finished floor elevation to pose a hazard to the structure. As soon as water flows underneath the home, there is a danger that the foundation piers could be undermined and subsequently fail. This condition occurs in a storm frequency as low as the 16-year storm, which has approximately a 6% probability of occuring or being exceeded in any given year.

The home is located within the Severe Erosion Hazard Zone. This zone is comprised of the active watercourse channels and adjacent areas likely to be eroded during a single major event, such as the 100-year flood.

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BOARD OF DIRECTORS
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Don Stapley
Mary Rose Garrido Wilcox

August 6, 2001

Mr. and Mrs. Willis and Rose Harper
38821 North 17th Avenue
Phoenix, AZ 85027

Dear Skunk Creek Property Owner,

I am writing to you as a representative of the Flood Control District of Maricopa County (District). I am the Project Manager for the Skunk Creek Watercourse Master Plan project currently in progress. Your home has been identified as being located within the regulatory *floodway* and/or the *Severe Erosion Hazard Zone* of Skunk Creek, either wholly or in part.

The *floodway* is defined by the Federal Emergency Management Agency (FEMA) as an area that is reserved for conveyance of floodwaters. It is usually a smaller area than the *floodplain*, which is the entire area that is flooded as a result of a 100-year storm. A 100-year storm is one that has a 1% chance of occurring or being exceeded in any given year. During extreme rainfall events, such as the 100-year storm, the *floodway* carries most of the flow in the stream. This makes it a high hazard area, where the safety of residents is threatened, in addition to the possibility of significant structural damage.

In addition to flood hazards, we have also identified three *erosion hazard zones,* which are shown on the aerial photograph. In desert washes such as Skunk Creek, a single major storm can result in significant bank erosion along the channel and undermine the foundations of nearby structures. *The Severe Erosion Hazard Zone* defines the area most likely to be eroded during a single major event, such as the 100-year flood. The area within the *Lateral Migration Erosion Hazard Zone* is the area likely to be eroded by a series of "typical" floods over the next 60 years, including a single major event such as the 100-year flood. It is representative of the area subject to lateral movement of the main channel of Skunk Creek. The *Long-Term Erosion Hazard Zone* includes the area that shows geological evidence of channel movement over the past 60 to 1,000 years, and represents the area of potential channel movement over the next 60 to 1,000 years in the future.

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Included in this packet you will find:

1) A Floodplain Status Information Sheet for your parcel of land, identified by Maricopa County Assessor Parcel Number.
2) An aerial photograph of your property taken in May 1999.
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Sincerely,

MDeRosa

Marilyn DeRosa, RG
Planning Project Manager

enclosures

FLOOD CONTROL DISTRICT
of
Maricopa County

2801 West Durango Street • Phoenix, Arizona 85009-6399
Telephone (602) 506-1501
Fax (602) 506-4601
TT (602) 506-5897

BOARD OF DIRECTORS
Jan Brewer
Fulton Brock
Andrew Kunasek
Don Stapley
Mary Rose Garrido Wilcox

August 6, 2001

Mr. and Mrs. Willis and Rose Harper
HC 1 Box 651
Strawberry, AZ 85544

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Sincerely,

MDeRosa

Marilyn DeRosa, RG
Planning Project Manager

enclosures

Floodplain Status Information Sheet

Parcel Number: 211-50-016J
Owner: Harper
Address: 38821 N. 17th Avenue
New River, AZ 85027
Phone: (623) 465-0366

Project Tag ID # 84

Structure	Mobile Home #1	Mobile Home #2	Mobile Home #3
Cross Section #	6	5	4
Approximate River Mile	20.47	20.45	20.45
Existing Condition 100-yr Flow [cfs]	27,300	27,300	27,300
Existing Condition 100-yr Water Surface Elevation [ft]	1840.6	1839.4	1839.4
Finished Floor Elevation (FFE) [ft]	1842.2	1840.3	1840.4
Depth of Water Above Finished Floor [ft]	-1.6	-0.9	-1.0
Flow Required to Reach Ground Underneath Home [cfs]	14,750[1]	14,750[1]	14,750[1]
	13,000[2]	14,250[2]	13,500[2]
Approx. Storm Return Interval Required to Reach FFE (or ground beneath mobile homes)	32-yr[1]	32-yr[1]	32-yr[1]
	11-yr[2]	13-yr[2]	12-yr[2]
Is Structure Within Floodway?	Yes	Yes	Yes
Erosion Hazard Zone	Long Term	Long Term	Long Term

[1] Flow and return interval from initial analysis, using USGS Skunk Creek stream gage frequency rating curve

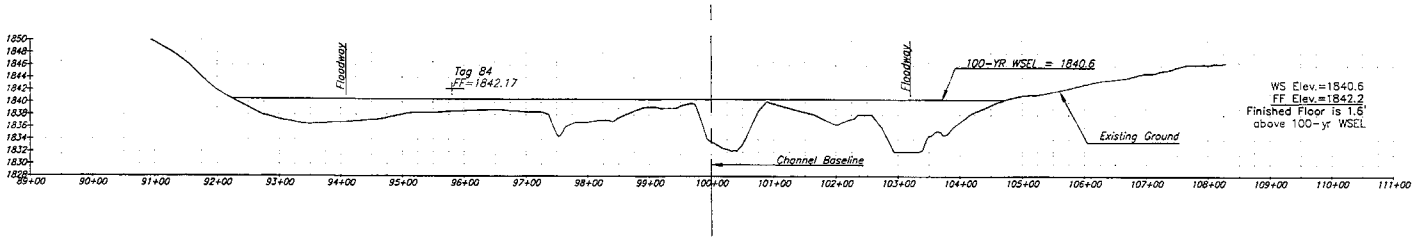
[2] Flow and return interval from site-specific analysis, using site-specific frequency rating curve

Summary of Findings

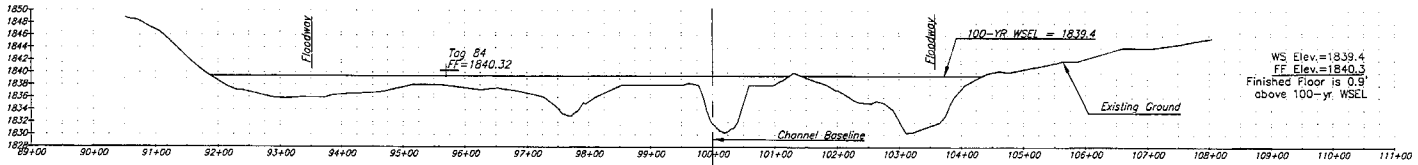
All structures on this parcel are located within the FEMA 100-year floodway. The floodwater does not reach any finished floor elevation, even in the 100-year flood. However, for mobile homes, the floodwaters do not have to reach the finished floor elevation to pose a hazard to the structure. As soon as water flows underneath the home, there is a danger that the foundation piers could be undermined and subsequently fail. However, it is difficult to determine the lesser flows required to reach most of the structures, because a high streambank protects much of the parcel. The initial analysis flow shown on the table is the breakout flow upstream of the parcel. The results from a more detailed site-specific analysis are also shown. These results show that water begins to flow under the home in a storm frequency as low as the 11-year storm, which has approximately a 9% probability of occuring or being exceeded in any given year.

All structures are located within the Long Term Erosion Hazard Zone. The danger of erosion in this zone is less than in the Severe or Lateral Migration Erosion Hazard Zones, but could occur at some point over the next 60 to 1,000 years.

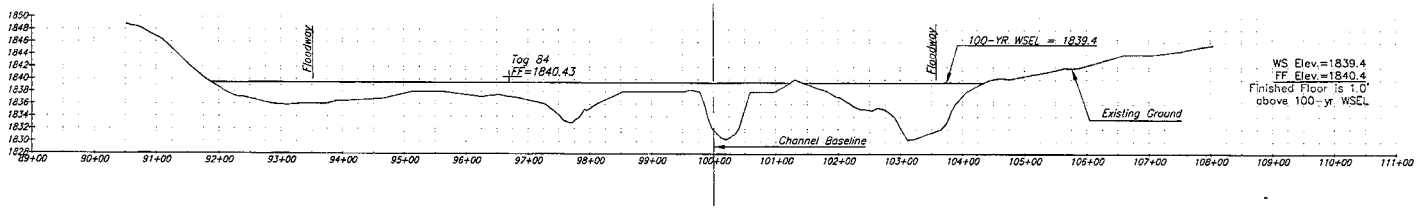
6
Mobile 1



5
Mobile 2



4
Mobile 3



NO.	REVISIONS	DATE	BY	CHK.
XS6.DWG				

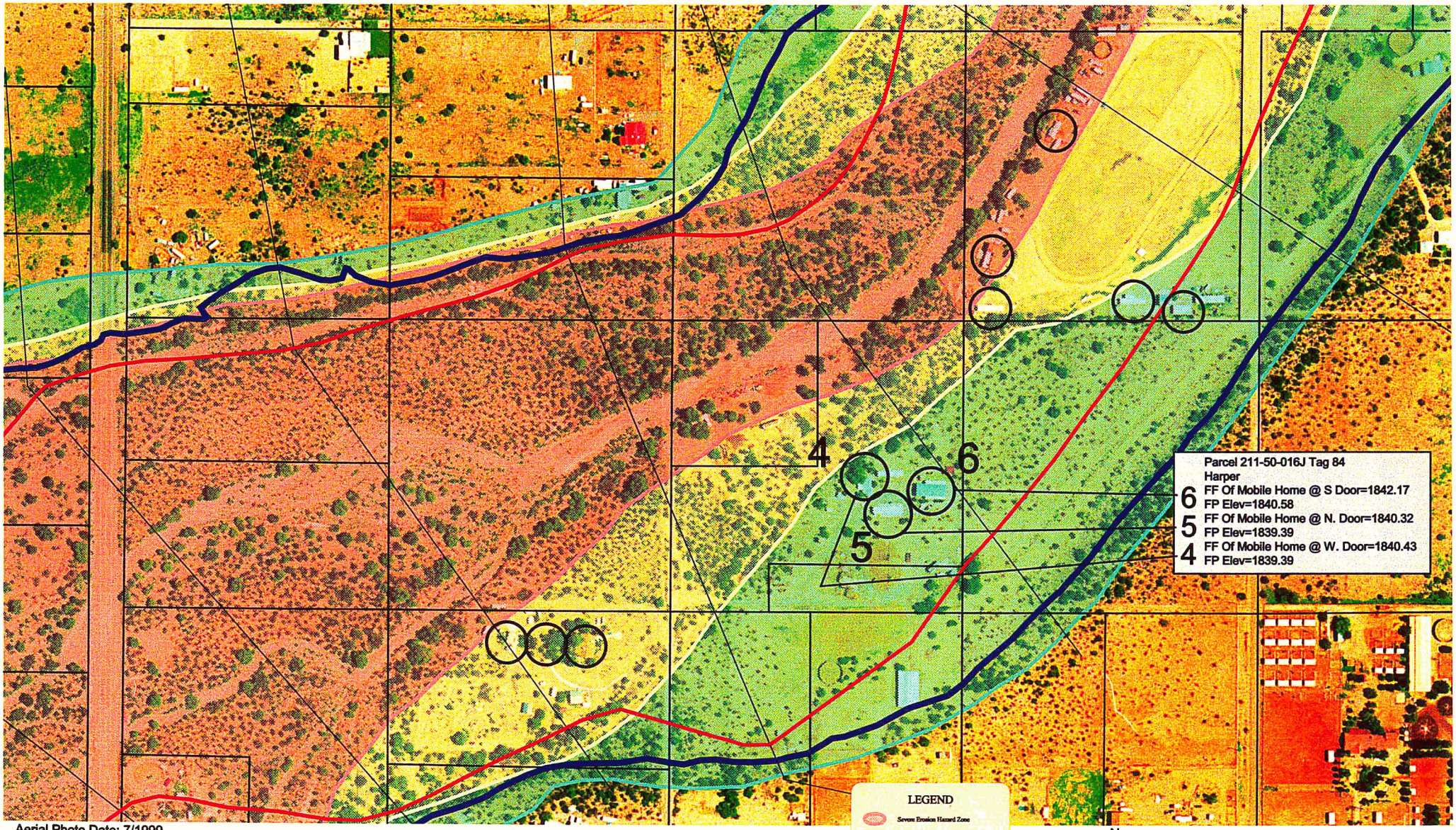
TETRA TECH, INC.
INFRASTRUCTURE SOUTHWEST GROUP
501 North 44th Street, Suite 185, Phoenix, AZ 85008
(602) 629-1100 FAX (602) 629-1186

SKUNK CREEK PHASE II
WATERCOURSE MASTER PLAN

JOB NO.	2350.0002
DESIGNED BY:	LML
DRAWN BY:	LML
CHECKED BY:	TRL
APPROVED BY:	TRL
DATE:	

STRUCTURE CROSS SECTIONS
Owner: HARPER
Cross Sections: 4, 5, 6

SCALE: HORIZ: 1" = 200'
CONT. INTERVAL =
DRAWING NO.
SHEET NO. OF:



Aerial Photo Date: 7/1999

N

Scale: 1"=200'

TETRA TECH, INC.
INFRASTRUCTURE SOUTHWEST GROUP
501 North 44th Street, Suite 125, Phoenix, AZ 85008
(602) 629-1100 FAX (602) 629-1188

FLOOD CONTROL DISTRICT
of
Maricopa County

2801 West Durango Street • Phoenix, Arizona 85009-6399
Telephone (602) 506-1501
Fax (602) 506-4601
TT (602) 506-5897

BOARD OF DIRECTORS
Jan Brewer
Fulton Brock
Andrew Kunasek
Don Stapley
Mary Rose Garrido Wilcox

August 6, 2001

Mr. and Mrs. Joe and Claudia Hines
43012 North 7th Avenue
New River, AZ 85087

Dear Mr. and Mrs. Hines,

Thank you for taking the time to meet with us in March regarding our Skunk Creek Watercourse Master Plan Study and your property near Skunk Creek. At that time we provided you with several items including a Floodplain Status Information Sheet, an aerial photograph, a cross-section plot (all specific to your parcel), and stream flow data for Skunk Creek. We also discussed floodplains, floodways, and erosion hazard zones.

Since that time we have updated the Floodplain Status Information Sheets. In addition, we have been unable to contact some of your neighbors in the floodway and/or Severe Erosion Hazard Zone. It is important that all homeowners living in these high hazard areas are provided with as much accurate information as possible regarding their property and the associated hazards, so we are sending this certified mailing to ensure all homeowners are provided the same information and are afforded the same opportunity to discuss these issues with us.

You will find the information provided in the letter is the same as that presented to you during our March visit. We have, however, included the updated Floodplain Status Information Sheet for your information.

As always, if you have any questions, or would like further information, don't hesitate to contact me.

Sincerely,

MDeRosa

Marilyn DeRosa, RG
Planning Project Manager

enclosures

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In our meeting with other homeowners who also have homes within the 100-year *floodway*, we discussed Tropical Storm Nora, which occurred in September 1997. Nora produced rainfall amounts in excess of the 4.6-inch 100-year precipitation amount for the Skunk Creek watershed. Nora produced rainfall amounts as high as 12 inches on top of Harquahala Mountain. If Nora had moved just a few more miles east, it would have hit the Skunk Creek watershed, and likely resulted in a 100-year flood on Skunk Creek. These storm events can and do happen in our area.

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MDeRosa

Marilyn DeRosa, RG
Planning Project Manager

enclosures

Floodplain Status Information Sheet

Parcel Number: 202-21-169
Owner: Hines
Address: 43012 N. 7th Ave.
New River, AZ 85087
Phone: (623) 465-7200

Project Tag ID # 847

Structure	House	Garage	
Cross Section #	19	20	
Approximate River Mile	23.20	23.20	
Existing Condition 100-yr Flow [cfs]	24,400	24,400	
Existing Condition 100-yr Water Surface Elevation [ft]	1984.2	1984.2	
Finished Floor Elevation (FFE) [ft]	1980.9	1980.5	
Depth of Water Above Finished Floor [ft]	3.3	3.7	
Flow Required to Reach FFE [cfs] (for mobile homes, flow required to reach ground underneath home)	8,000	6,600	
Approx. Storm Return Interval Required to Reach FFE (from USGS Skunk Creek stream gage data)	17-yr	13-yr	
Approx. Storm Return Interval Required to Reach FFE (from site-specific model data)	5-yr	4-yr	
Is Structure Within Floodway?	Yes	Yes	
Erosion Hazard Zone	Severe	Severe	

Summary of Findings

Both structures on this parcel are subject to flooding and are located within the FEMA 100-year floodway. During the 100-year flood, there would be approximately 3' 4" of water in the house. Lower frequency storms would also cause flooding problems. For the house, the 5-year storm, which has approximately a 20% probability of occuring or being exceeded in any given year, would reach the finished floor elevation.

Both structures are located within the Severe Erosion Hazard Zone. This zone is comprised of the active watercourse channels and adjacent areas likely to be eroded during a single major event, such as the 100-year flood.

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BOARD OF DIRECTORS
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August 6, 2001

Hopwood Family Trust
39030 North 15th Avenue
New River, AZ 85086

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We would be happy to meet with you to discuss the information presented in this packet, or any other concerns you may have concerning flood and erosion hazards to your property. If you would like to schedule a meeting, or have any other questions, please call.

Sincerely,

MDeRosa

Marilyn DeRosa, RG
Planning Project Manager

enclosures

Floodplain Status Information Sheet

Parcel Number: 211-50-022
Owner: Hopwood Family Trust
Address: 39030 N. 15th Ave.
New River, AZ 85086
Phone:

Project Tag ID # 62

Structure	Mobile Home #2 (gone)	House #1	Mobile Home #3	Mobile Home #1	House #2
Cross Section #	7	8	9	10	---
Approximate River Mile	20.53	20.55	20.56	20.61	20.57
Existing Condition 100-yr Flow [cfs]	27,300	27,300	27,300	27,300	27,300
Existing Condition 100-yr Water Surface Elevation [ft]	1843.8	1844.9	1845.7	1847.6	1845.7
Finished Floor Elevation (FFE) [ft]	1844.3	1844.9	1845.2	1848.6	1845.5
Depth of Water Above Finished Floor [ft]	-0.5	0.0	0.5	-1.0	0.2
Flow Required to Reach FFE [cfs]	14,750[1]	27,300[1]	14,750[1]	14,750[1]	14,750[1]
(for mobile homes, flow required to reach ground underneath home)	11,700 [2]	27,300 [2]	9,000 [2]	15,000 [2]	25,000 [2]
Approx. Storm Return Interval Required to Reach FFE	32-yr[1]	100-yr[1]	32-yr[1]	32-yr[1]	32-yr[1]
(or ground beneath mobile homes)	8-yr [2]	100-yr [2]	5-yr [2]	15-yr [2]	71-yr [2]
Is Structure Within Floodway?	Yes	Yes	Yes	Yes	No
Erosion Hazard Zone	Lateral Migration	Severe	Long Term	Severe	Long Term

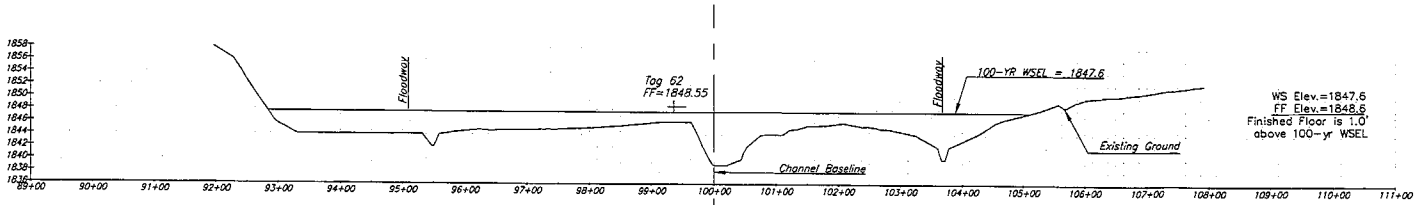
[1] Flow and return interval from initial analysis, using USGS Skunk Creek stream gage frequency rating curve
[2] Flow and return interval from site-specific analysis, using site-specific frequency rating curve

Summary of Findings

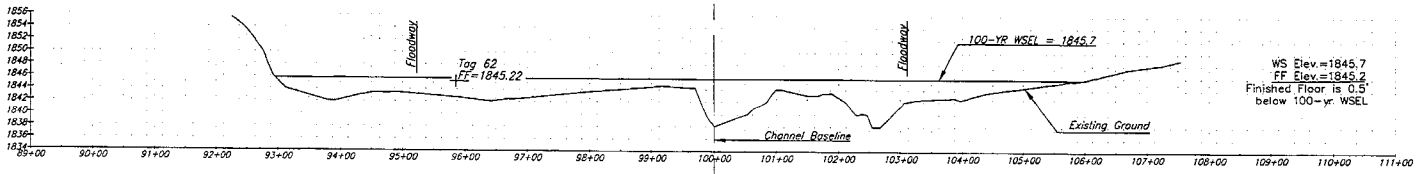
Four structures on this parcel are located within the FEMA 100-year floodway. The fifth structure, House #2, is not in the floodway, but would have approximately 2" of water in it during the 100-year flood. Lower frequency storms would also cause flooding problems. However, it is difficult to determine the lesser flows required to reach most of the structures, because a high streambank protects much of the parcel. The initial analysis flow shown on the table is the breakout flow upstream of the parcel. The results from a more detailed site-specific analysis are also shown. For the mobile homes, the floodwaters do not have to reach the finished floor elevation to pose a hazard to the structure. As soon as water flows underneath the home, there is a danger that the foundation piers could be undermined and subsequently fail. The site-specific analysis shows that water begins to flow under Mobile #3 in a storm frequency as low as the 5-year storm, which has approximately a 20% probability of occuring or being exceeded in any given year.

The structures on this parcel are located in various Erosion Hazard Zones. The danger of erosion is highest in the Severe Erosion Hazard Zone, where erosion could undercut a structure during a single major event, such as the 100-year flood.

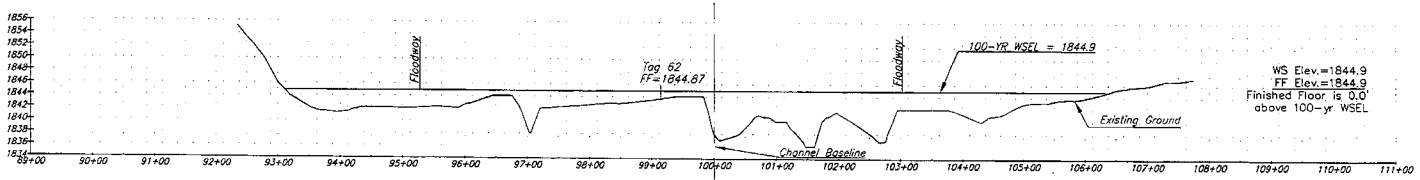
10
Mobile 1



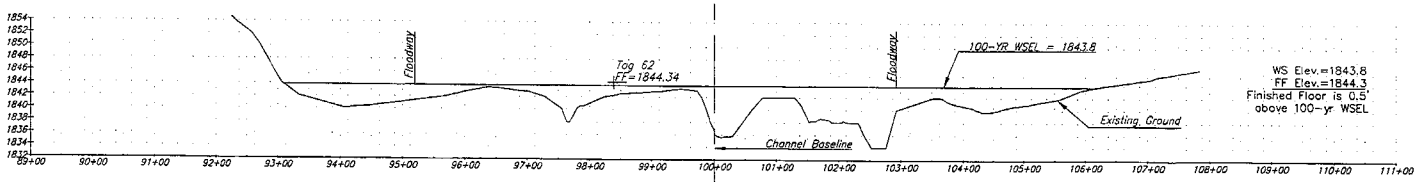
9
Mobile 3



8
House 1



7
Mobile 2



NO.	REVISIONS	DATE	BY	CHK.

K562.DWG

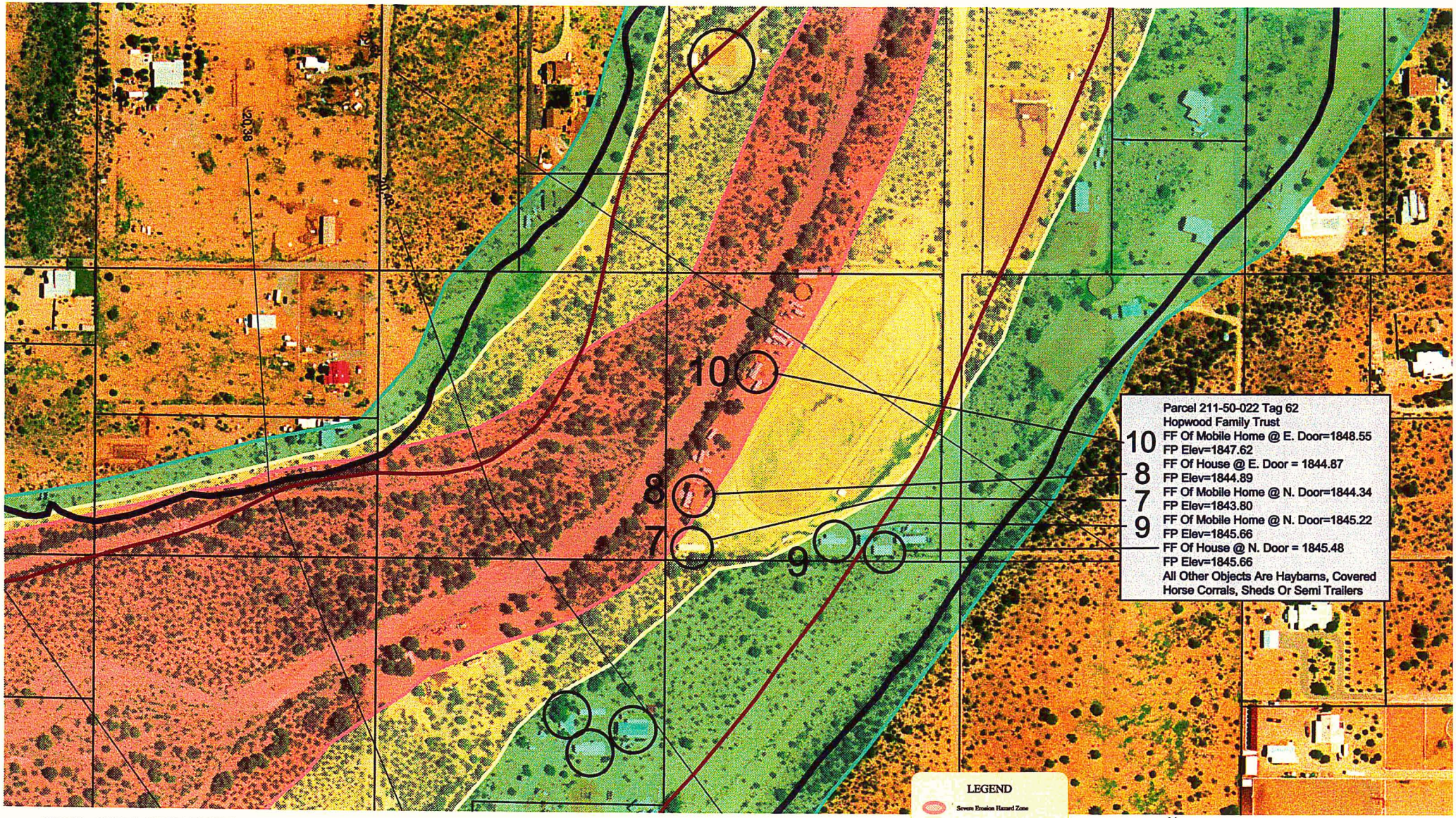
TETRA TECH, INC.
INFRASTRUCTURE SOUTHWEST GROUP
501 North 44th Street, Suite 125, Phoenix, AZ 85008
(602) 629-1100 FAX (602) 629-1186

SKUNK CREEK PHASE II
WATERCOURSE MASTER PLAN

JOB NO.	2350.0002
DESIGNED BY:	LML
DRAWN BY:	LML
CHECKED BY:	TRL
APPROVED BY:	TRL
DATE:	

STRUCTURE CROSS SECTIONS
Owner: HOPWOOD FAMILY TRUST
Cross Sections: 7, 8, 9, 10

SCALE: HORIZ: 1" = 200'
CONT. INTERVAL =
DRAWING NO.
SHEET NO. OF:



AERIAL PHOTO DATE: 7/1999

N

Scale: 1"=200'

TETRA TECH, INC
INFRASTRUCTURE SOUTHWEST GROUP
[illegible]

FLOOD CONTROL DISTRICT
of
Maricopa County

2801 West Durango Street • Phoenix, Arizona 85009-6399
Telephone (602) 506-1501
Fax (602) 506-4601
TT (602) 506-5897

BOARD OF DIRECTORS
Jan Brewer
Fulton Brock
Andrew Kunasek
Don Stapley
Mary Rose Garrido Wilcox

August 6, 2001

Kraus Investments
46834 North Shangri La Lane
New River, AZ 85027

Dear Skunk Creek Property Owner,

I am writing to you as a representative of the Flood Control District of Maricopa County (District). I am the Project Manager for the Skunk Creek Watercourse Master Plan project currently in progress. Your home has been identified as being located within the regulatory *floodway* and/or the *Severe Erosion Hazard Zone* of Skunk Creek, either wholly or in part.

The *floodway* is defined by the Federal Emergency Management Agency (FEMA) as an area that is reserved for conveyance of floodwaters. It is usually a smaller area than the *floodplain*, which is the entire area that is flooded as a result of a 100-year storm. A 100-year storm is one that has a 1% chance of occurring or being exceeded in any given year. During extreme rainfall events, such as the 100-year storm, the *floodway* carries most of the flow in the stream. This makes it a high hazard area, where the safety of residents is threatened, in addition to the possibility of significant structural damage.

In addition to flood hazards, we have also identified three *erosion hazard zones,* which are shown on the aerial photograph. In desert washes such as Skunk Creek, a single major storm can result in significant bank erosion along the channel and undermine the foundations of nearby structures. *The Severe Erosion Hazard Zone* defines the area most likely to be eroded during a single major event, such as the 100-year flood. The area within the *Lateral Migration Erosion Hazard Zone* is the area likely to be eroded by a series of "typical" floods over the next 60 years, including a single major event such as the 100-year flood. It is representative of the area subject to lateral movement of the main channel of Skunk Creek. The *Long-Term Erosion Hazard Zone* includes the area that shows geological evidence of channel movement over the past 60 to 1,000 years, and represents the area of potential channel movement over the next 60 to 1,000 years in the future.

The *Severe Erosion Hazard Zone* and the *Lateral Migration Erosion Hazard Zones* are new regulatory areas, under the administration of the Flood Control District of Maricopa County, similar to the 100-year *floodway.* The *Long-Term Erosion Hazard Zone* is not a regulatory area. It is provided for information only.

We have been meeting with other property owners with homes located within the *floodway* and/or *Severe Erosion Hazard Zone* who responded to previous mailings or attended a public meeting that was held in the area. During the meetings, we review *floodway* hazard information specific to each property. The purpose of this mailing is to provide you with the same information concerning your property.

Included in this packet you will find:

1) A Floodplain Status Information Sheet for your parcel of land, identified by Maricopa County Assessor Parcel Number.
2) An aerial photograph of your property taken in May 1999.
3) A cross section plot of Skunk Creek taken through your home or other structure on your property.
4) A Skunk Creek Peak Flow Data sheet for a stream flow gage at the Skunk Creek crossing of Interstate 17.

The Floodplain Status Information Sheets list the flooding and erosion hazard status of each significant structure on your property. The depth of flooding in the structure is shown for the 100-year flood, as well as an estimate of the amount of flow it would take in Skunk Creek to start flooding the structure. In some cases, this is much less than a 100-year flood. The aerial photograph shows the boundaries of the 100-year *floodway* and *floodplain* relative to your property.

The cross section plot shows the location and elevation of significant structures on your property relative to the Skunk Creek channel. The water depth during the 100-year flood is also shown.

The Skunk Creek Peak Flow Data sheet shows the historical record of high flows in Skunk Creek from 1959 through 1999. This data was recorded by the U.S. Geological Survey at a monitoring station just east of I-17. For comparison, the peak flows for the 100-year, 25-year, 10-year, 5-year, and 2-year storms are also shown. The highest flow recorded in Skunk Creek during this time period is less than a 25-year flood, or a flood that has a 4% probability of occurring or being exceeded in any given year.

In our meeting with other homeowners who also have homes within the 100-year *floodway*, we discussed Tropical Storm Nora, which occurred in September 1997. Nora produced rainfall amounts in excess of the 4.6-inch 100-year precipitation amount for the Skunk Creek watershed. Nora produced rainfall amounts as high as 12 inches on top of Harquahala Mountain. If Nora had moved just a few more miles east, it would have hit the Skunk Creek watershed, and likely resulted in a 100-year flood on Skunk Creek. These storm events can and do happen in our area.

As part of the Skunk Creek Watercourse Master Plan, the District is preparing a Flood Warning Plan to appraise residents along Skunk Creek of impending dangers from potential floods. You will receive more information regarding the flood warning program in the future. We are also considering recommendation of a possible voluntary acquisition program for homes situated within the 100-year *floodway* and/or the *Severe Erosion Hazard Zone*.

If approved by the Flood Control Advisory Board and the Maricopa County Board of Supervisors, homeowners would be given the choice of staying where they are or selling the property for fair market value. Under an acquisition scenario, the District would then demolish structures on the property and return it to as close to natural conditions as possible.

We would be happy to meet with you to discuss the information presented in this packet, or any other concerns you may have concerning flood and erosion hazards to your property. If you would like to schedule a meeting, or have any other questions, please call.

Sincerely,

MDeRosa

Marilyn DeRosa, RG
Planning Project Manager

enclosures

Skunk Creek Watercourse Master Plan, Phase II

Floodplain Status Information Sheet

Parcel Number: 202-21-008T
Owner: Kraus Investments
Address: 46834 N. Shangri La Lane
New River, AZ 85027
Phone: (623) 465-5959

Project Tag ID # 579

Structure	First Impacted Mobile		
Cross Section #	33		
Approximate River Mile	24.06		
Existing Condition 100-yr Flow [cfs]	11,800		
Existing Condition 100-yr Water Surface Elevation [ft]	2026.4*		
Finished Floor Elevation (FFE) [ft]	not surveyed		
Depth of Water Above Finished Floor [ft]	---		
Flow Required to Reach FFE [cfs] (for mobile homes, flow required to reach ground underneath home)	4,400		
Approx. Storm Return Interval Required to Reach FFE (or ground beneath mobile homes)	6-yr		
Is Structure Within Floodway?	No		
Erosion Hazard Zone	Severe		

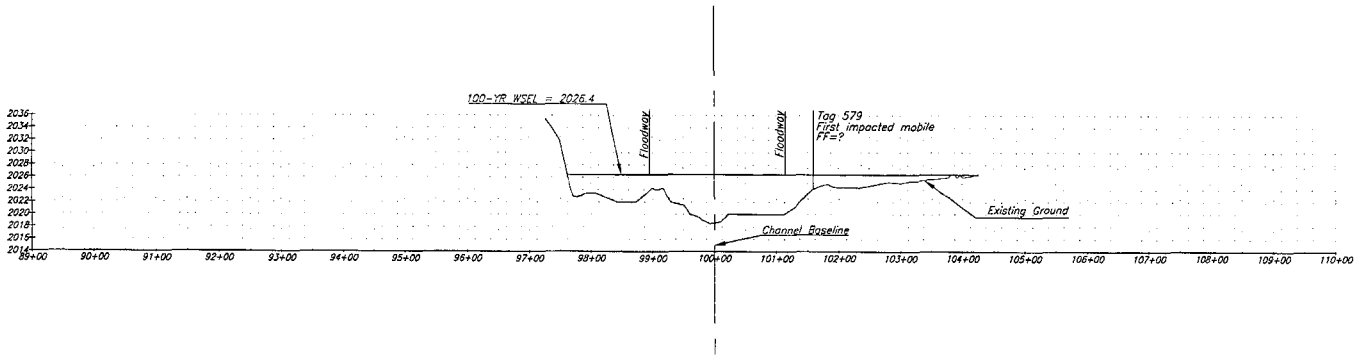
* Water surface elevation was interpolated between HEC-RAS model cross sections

Summary of Findings

There are multiple mobile homes on this parcel that are located within the FEMA 100-year floodplain. It is unknown if floodwater reaches the finished floor elevation in the 100-year flood, because the structures were not surveyed. However, for mobile homes, the floodwaters do not have to reach the finished floor elevation to pose a hazard to the structure. As soon as water flows underneath the home, there is a danger that the foundation piers could be undermined and subsequently fail. This condition occurs in a storm frequency as low as the 6-year storm, which has approximately a 1.7% probability of occuring or being exceeded in any given year.

The structures on this parcel are located in various Erosion Hazard Zones. The first impacted mobile home is located in the Severe Erosion Hazard Zone, where the danger of erosion is highest, because a structure could be undercut during a single major event, such as the 100-year flood.

33
Mobile



NO.	REVISIONS	DATE	BY	CHK.

XS929.DWG

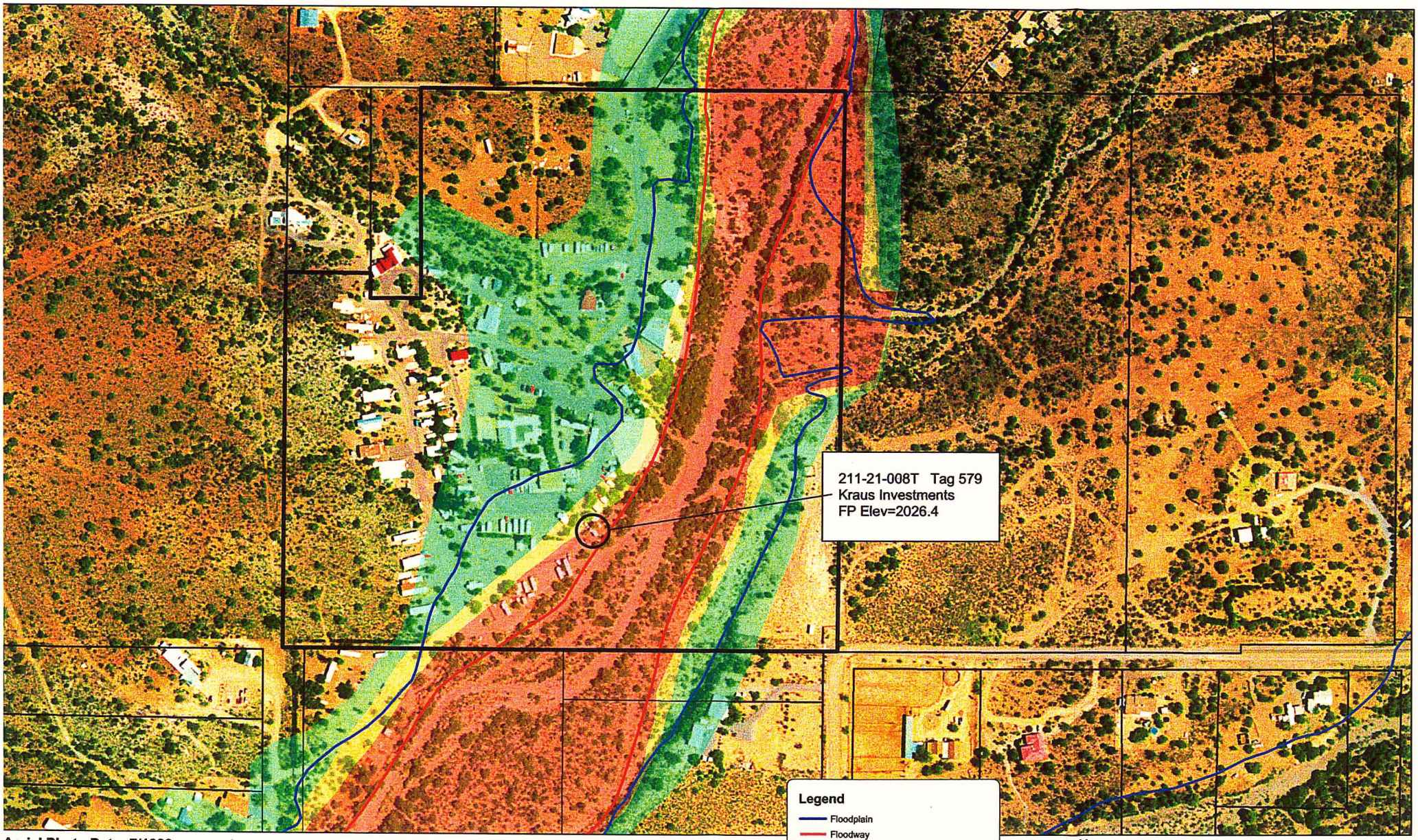
TETRA TECH, INC.
INFRASTRUCTURE SOUTHWEST GROUP
501 North 44th Street, Suite 120, Phoenix, AZ 85008
(602) 629-1100 FAX (602) 629-1186

SKUNK CREEK PHASE II
WATERCOURSE MASTER PLAN

JOB NO.	2350.0002
DESIGNED BY:	LML
DRAWN BY:	LML
CHECKED BY:	TRL
APPROVED BY:	TRL
DATE:	

STRUCTURE CROSS SECTION
Owner: KRAUS INVESTMENTS
Cross Section: 33

SCALE: HORIZ: 1"= 200'
CONT. INTERVAL =
DRAWING NO.
SHEET NO. OF:



Aerial Photo Date: 7/1999

Tetra Tech, Inc.
Infrastructure Southwest Group
4801 East Washington Street Suite 260, Phoenix, Arizona 85034
(602) 682-3300 Fax: (602) 244-1164

FLOOD CONTROL DISTRICT
of
Maricopa County

2801 West Durango Street • Phoenix, Arizona 85009-6399
Telephone (602) 506-1501
Fax (602) 506-4601
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BOARD OF DIRECTORS
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Fulton Brock
Andrew Kunasek
Don Stapley
Mary Rose Garrido Wilcox

August 6, 2001

Mr. and Mrs. Tim and Tammy Mathis
38640 North 17th Avenue
New River, AZ 85086

Dear Mr. and Mrs. Mathis,

Thank you for taking the time to meet with us in March regarding our Skunk Creek Watercourse Master Plan Study and your property near Skunk Creek. At that time we provided you with several items including a Floodplain Status Information Sheet, an aerial photograph, a cross-section plot (all specific to your parcel), and stream flow data for Skunk Creek. We also discussed floodplains, floodways, and erosion hazard zones.

Since that time we have updated the Floodplain Status Information Sheets. In addition, we have been unable to contact some of your neighbors in the floodway and/or Severe Erosion Hazard Zone. It is important that all homeowners living in these high hazard areas are provided with as much accurate information as possible regarding their property and the associated hazards, so we are sending this certified mailing to ensure all homeowners are provided the same information and are afforded the same opportunity to discuss these issues with us.

You will find the information provided in the letter is the same as that presented to you during our March visit. We have, however, included the updated Floodplain Status Information Sheet for your information.

As always, if you have any questions, or would like further information, don't hesitate to contact me.

Sincerely,

Thomas C. Jones
for
Marilyn DeRosa, RG
Planning Project Manager

enclosures

FLOOD CONTROL DISTRICT
of
Maricopa County

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Mary Rose Garrido Wilcox

August 6, 2001

Mr. and Mrs. Tim and Tammy Mathis
38640 North 17th Avenue
New River, AZ 85086

Dear Skunk Creek Property Owner,

I am writing to you as a representative of the Flood Control District of Maricopa County (District). I am the Project Manager for the Skunk Creek Watercourse Master Plan project currently in progress. Your home has been identified as being located within the regulatory *floodway* and/or the *Severe Erosion Hazard Zone* of Skunk Creek, either wholly or in part.

The *floodway* is defined by the Federal Emergency Management Agency (FEMA) as an area that is reserved for conveyance of floodwaters. It is usually a smaller area than the *floodplain*, which is the entire area that is flooded as a result of a 100-year storm. A 100-year storm is one that has a 1% chance of occurring or being exceeded in any given year. During extreme rainfall events, such as the 100-year storm, the *floodway* carries most of the flow in the stream. This makes it a high hazard area, where the safety of residents is threatened, in addition to the possibility of significant structural damage.

In addition to flood hazards, we have also identified three *erosion hazard zones,* which are shown on the aerial photograph. In desert washes such as Skunk Creek, a single major storm can result in significant bank erosion along the channel and undermine the foundations of nearby structures. *The Severe Erosion Hazard Zone* defines the area most likely to be eroded during a single major event, such as the 100-year flood. The area within the *Lateral Migration Erosion Hazard Zone* is the area likely to be eroded by a series of "typical" floods over the next 60 years, including a single major event such as the 100-year flood. It is representative of the area subject to lateral movement of the main channel of Skunk Creek. The *Long-Term Erosion Hazard Zone* includes the area that shows geological evidence of channel movement over the past 60 to 1,000 years, and represents the area of potential channel movement over the next 60 to 1,000 years in the future.

The *Severe Erosion Hazard Zone* and the *Lateral Migration Erosion Hazard Zones* are new regulatory areas, under the administration of the Flood Control District of Maricopa County, similar to the 100-year *floodway*. The *Long-Term Erosion Hazard Zone* is not a regulatory area. It is provided for information only.

We have been meeting with other property owners with homes located within the *floodway* and/or *Severe Erosion Hazard Zone* who responded to previous mailings or attended a public meeting that was held in the area. During the meetings, we review *floodway* hazard information specific to each property. The purpose of this mailing is to provide you with the same information concerning your property.

Included in this packet you will find:

1) A Floodplain Status Information Sheet for your parcel of land, identified by Maricopa County Assessor Parcel Number.
2) An aerial photograph of your property taken in May 1999.
3) A cross section plot of Skunk Creek taken through your home or other structure on your property.
4) A Skunk Creek Peak Flow Data sheet for a stream flow gage at the Skunk Creek crossing of Interstate 17.

The Floodplain Status Information Sheets list the flooding and erosion hazard status of each significant structure on your property. The depth of flooding in the structure is shown for the 100-year flood, as well as an estimate of the amount of flow it would take in Skunk Creek to start flooding the structure. In some cases, this is much less than a 100-year flood. The aerial photograph shows the boundaries of the 100-year *floodway* and *floodplain* relative to your property.

The cross section plot shows the location and elevation of significant structures on your property relative to the Skunk Creek channel. The water depth during the 100-year flood is also shown.

The Skunk Creek Peak Flow Data sheet shows the historical record of high flows in Skunk Creek from 1959 through 1999. This data was recorded by the U.S. Geological Survey at a monitoring station just east of I-17. For comparison, the peak flows for the 100-year, 25-year, 10-year, 5-year, and 2-year storms are also shown. The highest flow recorded in Skunk Creek during this time period is less than a 25-year flood, or a flood that has a 4% probability of occurring or being exceeded in any given year.

In our meeting with other homeowners who also have homes within the 100-year *floodway*, we discussed Tropical Storm Nora, which occurred in September 1997. Nora produced rainfall amounts in excess of the 4.6-inch 100-year precipitation amount for the Skunk Creek watershed. Nora produced rainfall amounts as high as 12 inches on top of Harquahala Mountain. If Nora had moved just a few more miles east, it would have hit the Skunk Creek watershed, and likely resulted in a 100-year flood on Skunk Creek. These storm events can and do happen in our area.

As part of the Skunk Creek Watercourse Master Plan, the District is preparing a Flood Warning Plan to appraise residents along Skunk Creek of impending dangers from potential floods. You will receive more information regarding the flood warning program in the future. We are also considering recommendation of a possible voluntary acquisition program for homes situated within the 100-year *floodway* and/or the *Severe Erosion Hazard Zone*.

If approved by the Flood Control Advisory Board and the Maricopa County Board of Supervisors, homeowners would be given the choice of staying where they are or selling the property for fair market value. Under an acquisition scenario, the District would then demolish structures on the property and return it to as close to natural conditions as possible.

We would be happy to meet with you to discuss the information presented in this packet, or any other concerns you may have concerning flood and erosion hazards to your property. If you would like to schedule a meeting, or have any other questions, please call.

Sincerely,

MDeRosa

Marilyn DeRosa, RG
Planning Project Manager

enclosures

Floodplain Status Information Sheet

Parcel Number: 211-50-037C
Owner: Mathis
Address: 38640 N. 17th Ave.
New River, AZ 85086
Phone: (623) 465-8731

Project Tag ID # 104

Structure	Mobile Home	Building	House
Cross Section #	1	2	3
Approximate River Mile	20.26	20.29	20.32
Existing Condition 100-yr Flow [cfs]	27,300	27,300	27,300
Existing Condition 100-yr Water Surface Elevation [ft]	1830.7	1832.2	1833.3
Finished Floor Elevation (FFE) [ft]	1831.5	1830.9	1832.5
Depth of Water Above Finished Floor [ft]	-0.8	1.3	0.8
Flow Required to Reach FFE [cfs] (for mobile homes, flow required to reach ground underneath home)	13,600	14,200	19,600
Approx. Storm Return Interval Required to Reach FFE (from USGS Skunk Creek stream gage data)	29-yr	31-yr	53-yr
Approx. Storm Return Interval Required to Reach FFE (from site-specific model data)	12-yr	13-yr	31-yr
Is Structure Within Floodway?	Yes	Yes	Yes
Erosion Hazard Zone	Lateral Migration	Lateral Migration	Lateral Migration

Summary of Findings

All structures on this parcel are subject to flooding and are located within the FEMA 100-year floodway. During the 100-year flood, there would be approximately 10 inches of water in the house. Lower frequency storms would also cause flooding problems. For the house, the 31-year storm, which has approximately a 3% probability of occuring or being exceeded in any given year, would reach the finished floor elevation. For the mobile home, the floodwaters do not have to reach the finished floor elevation to pose a hazard to the structure. As soon as water flows underneath the home, there is a danger that the foundation piers could be undermined and subsequently fail. This condition occurs in a storm frequency as low as the 12-year storm, which has approximately an 8% probability of occuring or being exceeded in any given year.

All structures on this parcel are located within the Lateral Migration Erosion Hazard Zone. The danger of erosion in this zone is less than in the Severe Erosion Hazard Zone, but could occur at some point within the next 60 years.

FLOOD CONTROL DISTRICT
of
Maricopa County

2801 West Durango Street • Phoenix, Arizona 85009-6399
Telephone (602) 506-1501
Fax (602) 506-4601
TT (602) 506-5897

BOARD OF DIRECTORS
Jan Brewer
Fulton Brock
Andrew Kunasek
Don Stapley
Mary Rose Garrido Wilcox

August 6, 2001

Mr. and Mrs. James and Kasey McKeag
755 West Honda Bow Road
New River, AZ 85086

Dear Mr. and Mrs. McKeag,

Thank you for taking the time to meet with us in March regarding our Skunk Creek Watercourse Master Plan Study and your property near Skunk Creek. At that time we provided you with several items including a Floodplain Status Information Sheet, an aerial photograph, a cross-section plot (all specific to your parcel), and stream flow data for Skunk Creek. We also discussed floodplains, floodways, and erosion hazard zones.

Since that time we have updated the Floodplain Status Information Sheets. In addition, we have been unable to contact some of your neighbors in the floodway and/or Severe Erosion Hazard Zone. It is important that all homeowners living in these high hazard areas are provided with as much accurate information as possible regarding their property and the associated hazards, so we are sending this certified mailing to ensure all homeowners are provided the same information and are afforded the same opportunity to discuss these issues with us.

You will find the information provided in the letter is the same as that presented to you during our March visit. We have, however, included the updated Floodplain Status Information Sheet for your information.

As always, if you have any questions, or would like further information, don't hesitate to contact me.

Sincerely,

Thomas R. Francis
for

Marilyn DeRosa, RG
Planning Project Manager

enclosures

FLOOD CONTROL DISTRICT
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Maricopa County

2801 West Durango Street • Phoenix, Arizona 85009-6399
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August 6, 2001

Mr. and Mrs. James and Kasey McKeag
755 West Honda Bow Road
New River, AZ 85086

Dear Skunk Creek Property Owner,

I am writing to you as a representative of the Flood Control District of Maricopa County (District). I am the Project Manager for the Skunk Creek Watercourse Master Plan project currently in progress. Your home has been identified as being located within the regulatory *floodway* and/or the *Severe Erosion Hazard Zone* of Skunk Creek, either wholly or in part.

The *floodway* is defined by the Federal Emergency Management Agency (FEMA) as an area that is reserved for conveyance of floodwaters. It is usually a smaller area than the *floodplain*, which is the entire area that is flooded as a result of a 100-year storm. A 100-year storm is one that has a 1% chance of occurring or being exceeded in any given year. During extreme rainfall events, such as the 100-year storm, the *floodway* carries most of the flow in the stream. This makes it a high hazard area, where the safety of residents is threatened, in addition to the possibility of significant structural damage.

In addition to flood hazards, we have also identified three *erosion hazard zones,* which are shown on the aerial photograph. In desert washes such as Skunk Creek, a single major storm can result in significant bank erosion along the channel and undermine the foundations of nearby structures. *The Severe Erosion Hazard Zone* defines the area most likely to be eroded during a single major event, such as the 100-year flood. The area within the *Lateral Migration Erosion Hazard Zone* is the area likely to be eroded by a series of "typical" floods over the next 60 years, including a single major event such as the 100-year flood. It is representative of the area subject to lateral movement of the main channel of Skunk Creek. The *Long-Term Erosion Hazard Zone* includes the area that shows geological evidence of channel movement over the past 60 to 1,000 years, and represents the area of potential channel movement over the next 60 to 1,000 years in the future.

The *Severe Erosion Hazard Zone* and the *Lateral Migration Erosion Hazard Zones* are new regulatory areas, under the administration of the Flood Control District of Maricopa County, similar to the 100-year *floodway*. The *Long-Term Erosion Hazard Zone* is not a regulatory area. It is provided for information only.

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1) A Floodplain Status Information Sheet for your parcel of land, identified by Maricopa County Assessor Parcel Number.
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The Floodplain Status Information Sheets list the flooding and erosion hazard status of each significant structure on your property. The depth of flooding in the structure is shown for the 100-year flood, as well as an estimate of the amount of flow it would take in Skunk Creek to start flooding the structure. In some cases, this is much less than a 100-year flood. The aerial photograph shows the boundaries of the 100-year *floodway* and *floodplain* relative to your property.

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In our meeting with other homeowners who also have homes within the 100-year *floodway*, we discussed Tropical Storm Nora, which occurred in September 1997. Nora produced rainfall amounts in excess of the 4.6-inch 100-year precipitation amount for the Skunk Creek watershed. Nora produced rainfall amounts as high as 12 inches on top of Harquahala Mountain. If Nora had moved just a few more miles east, it would have hit the Skunk Creek watershed, and likely resulted in a 100-year flood on Skunk Creek. These storm events can and do happen in our area.

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Sincerely,

MDeRosa

Marilyn DeRosa, RG
Planning Project Manager

enclosures

Floodplain Status Information Sheet

Parcel Number: 211-22-002B
Owner: McKeag
Address: 755 W. Honda Bow Rd.
New River, AZ 85086
Phone:

Project Tag ID # 5

Structure	House	Garage	
Cross Section #	14	13	
Approximate River Mile	22.90	22.89	
Existing Condition 100-yr Flow [cfs]	24,400	24,400	
Existing Condition 100-yr Water Surface Elevation [ft]	1968.3	1967.0	
Finished Floor Elevation (FFE) [ft]	1965.3	1964.0	
Depth of Water Above Finished Floor [ft]	3.0	3.0	
Flow Required to Reach FFE [cfs] (for mobile homes, flow required to reach ground underneath home)	8,000	8,600	
Approx. Storm Return Interval Required to Reach FFE (from USGS Skunk Creek stream gage data)	17-yr	20-yr	
Approx. Storm Return Interval Required to Reach FFE (from site-specific model data)	5-yr	6-yr	
Is Structure Within Floodway?	Yes	Yes	
Erosion Hazard Zone	Severe	Severe	

Summary of Findings

Both structures on this parcel are subject to flooding and are located within the FEMA 100-year floodway. During the 100-year flood, there would be approximately 3 feet of water in the house and garage. Lower frequency storms would also cause flooding problems. For the house, the 5-year storm, which has approximately a 20% probability of occuring or being exceeded in any given year, would reach the finished floor elevation.

Both structures are located within the Severe Erosion Hazard Zone. This zone is comprised of the active watercourse channels and adjacent areas likely to be eroded during a single major event, such as the 100-year flood.

FLOOD CONTROL DISTRICT
of
Maricopa County

2801 West Durango Street • Phoenix, Arizona 85009-6399
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Fax (602) 506-4601
TT (602) 506-5897

BOARD OF DIRECTORS
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Fulton Brock
Andrew Kunasek
Don Stapley
Mary Rose Garrido Wilcox

August 6, 2001

Ms. Patricia Parks
3002 West Muriel Drive
Phoenix, AZ 85053

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Marilyn DeRosa, RG
Planning Project Manager

enclosures

FLOOD CONTROL DISTRICT
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August 6, 2001

Ms. Patricia Parks
38210 North 21st Avenue
New River, AZ 85086

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Sincerely,

MDeRosa

Marilyn DeRosa, RG
Planning Project Manager

enclosures

Floodplain Status Information Sheet

Parcel Number: 203-32-006
Owner: Parks
Address: 38210 N. 21st Avenue
Phoenix, AZ 85053
Phone:

Project Tag ID # 148

Structure	Mobile		
Cross Section #	31		
Approximate River Mile	19.66		
Existing Condition 100-yr Flow [cfs]	27,300		
Existing Condition 100-yr Water Surface Elevation [ft]	1802.6*		
Finished Floor Elevation (FFE) [ft]	not surveyed		
Depth of Water Above Finished Floor [ft]	---		
Flow Required to Reach FFE [cfs] (for mobile homes, flow required to reach ground underneath home)	---		
Approx. Storm Return Interval Required to Reach FFE (or ground beneath mobile homes)	>100-yr		
Is Structure Within Floodway?	No		
Erosion Hazard Zone	Severe		

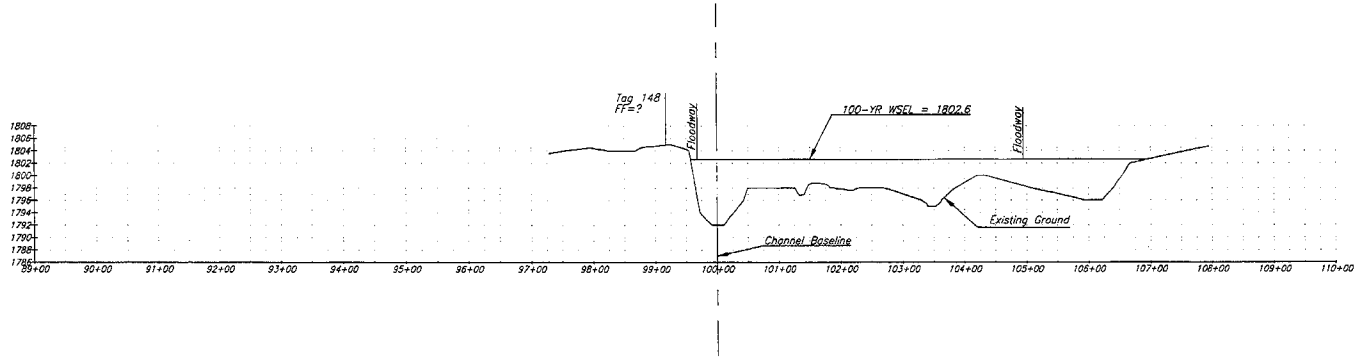
* Water surface elevation was interpolated between HEC-RAS model cross sections

Summary of Findings

The mobile home on this parcel is not located within the FEMA 100-year floodplain.

The home is located within the Severe Erosion Hazard Zone. This zone is comprised of the active watercourse channels and adjacent areas likely to be eroded during a single major event, such as the 100-year flood.

31
Mobile



NO.	REVISIONS	DATE	BY	CHK.

XS148.DWG

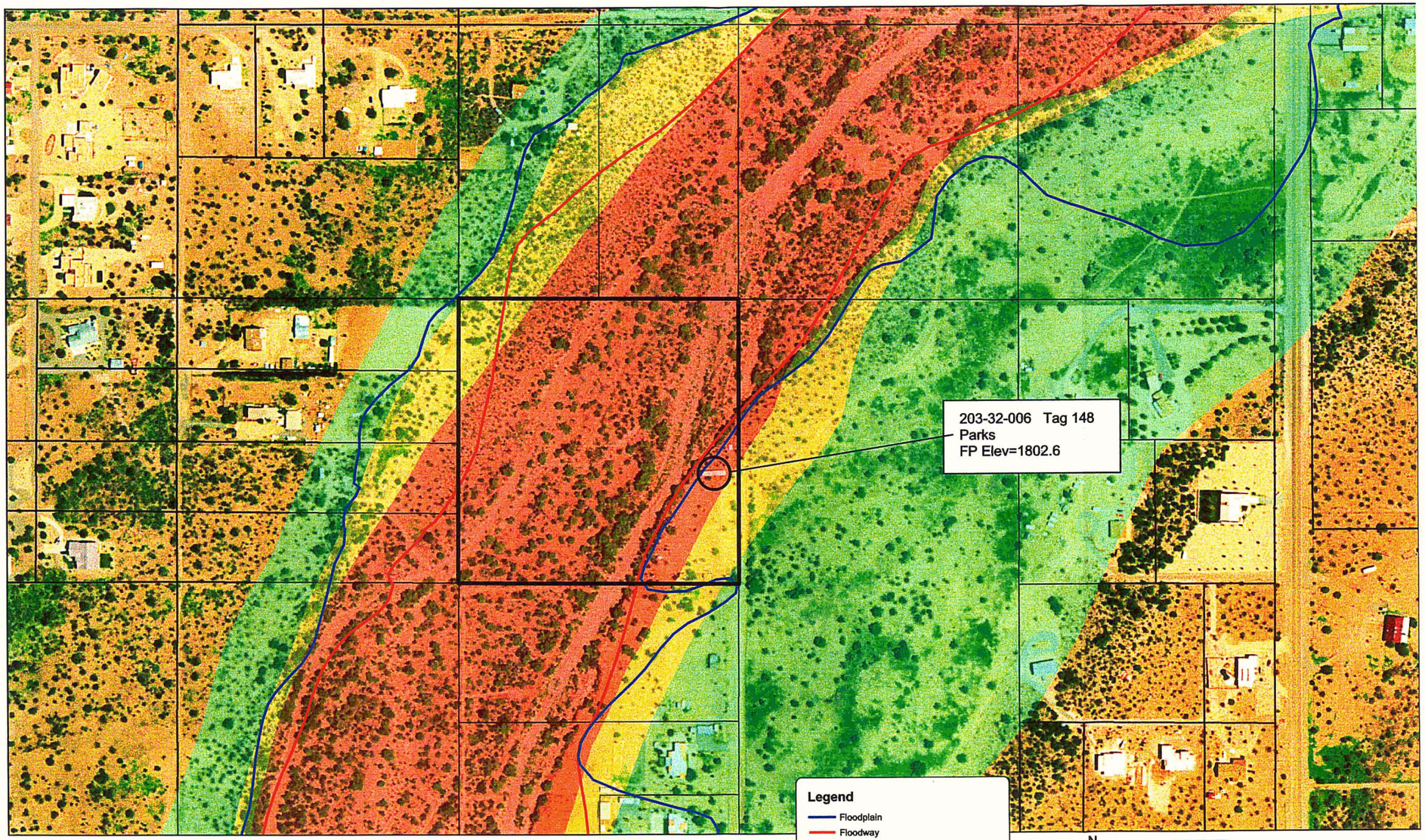
TETRA TECH, INC.
INFRASTRUCTURE SOUTHWEST GROUP
501 North 44th Street, Suite 125, Phoenix, AZ 85008
(602) 629-1100 FAX (602) 629-1186

SKUNK CREEK PHASE II
WATERCOURSE MASTER PLAN

JOB NO.	2350.0002
DESIGNED BY:	LML
DRAWN BY:	LML
CHECKED BY:	TRL
APPROVED BY:	TRL
DATE:	

STRUCTURE CROSS SECTION
Owner: PARKS
Cross Section: 31

SCALE: HORIZ: 1" = 200'
CONT. INTERVAL =
DRAWING NO.
SHEET NO. OF:



Aerial Photo Date: 7/1999

Tetra Tech, Inc.
Infrastructure Southwest Group
4801 East Washington Street Suite 260, Phoenix, Arizona 85034
(602) 683-3300 Fax: (602) 244-1144

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Don Stapley
Mary Rose Garrido Wilcox

August 6, 2001

Mr. and Mrs. Michael and Debra Parry
P.O. Box 4748
Cave Creek, AZ 85327

Dear Skunk Creek Property Owner,

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As part of the Skunk Creek Watercourse Master Plan, the District is preparing a Flood Warning Plan to appraise residents along Skunk Creek of impending dangers from potential floods. You will receive more information regarding the flood warning program in the future. We are also considering recommendation of a possible voluntary acquisition program for homes situated within the 100-year *floodway* and/or the *Severe Erosion Hazard Zone.*

If approved by the Flood Control Advisory Board and the Maricopa County Board of Supervisors, homeowners would be given the choice of staying where they are or selling the property for fair market value. Under an acquisition scenario, the District would then demolish structures on the property and return it to as close to natural conditions as possible.

We would be happy to meet with you to discuss the information presented in this packet, or any other concerns you may have concerning flood and erosion hazards to your property. If you would like to schedule a meeting, or have any other questions, please call.

Sincerely,

MDeRosa

Marilyn DeRosa, RG
Planning Project Manager

enclosures

Skunk Creek Watercourse Master Plan, Phase II

Floodplain Status Information Sheet

Parcel Number: 202-21-150
Owner: Parry
Address: 44833 N. Shangri La Lane
New River, AZ 85027
Phone: (623) 465-9340

Project Tag ID # 826

Structure	Mobile		
Cross Section #	34		
Approximate River Mile	24.54		
Existing Condition 100-yr Flow [cfs]	9,700		
Existing Condition 100-yr Water Surface Elevation [ft]	2046.4*		
Finished Floor Elevation (FFE) [ft]	not surveyed		
Depth of Water Above Finished Floor [ft]	---		
Flow Required to Reach FFE [cfs] (for mobile homes, flow required to reach ground underneath home)	5,000		
Approx. Storm Return Interval Required to Reach FFE (or ground beneath mobile homes)	13-yr		
Is Structure Within Floodway?	No		
Erosion Hazard Zone	Severe		

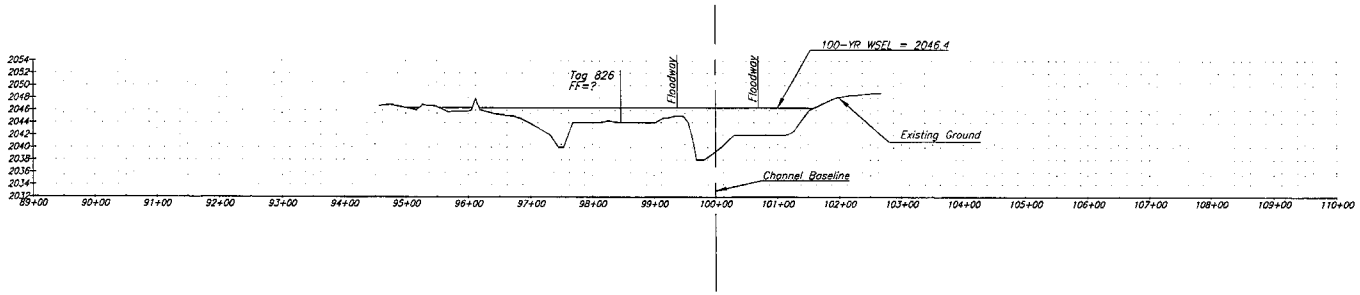
* Water surface elevation was interpolated between HEC-RAS model cross sections

Summary of Findings

The mobile home on this parcel is located within the FEMA 100-year floodplain. It is unknown if floodwater reaches the finished floor elevation in the 100-year flood, because the structure was not surveyed. However, for mobile homes, the floodwaters do not have to reach the finished floor elevation to pose a hazard to the structure. As soon as water flows underneath the home, there is a danger that the foundation piers could be undermined and subsequently fail. This condition occurs in a storm frequency as low as the 13-year storm, which has approximately a 8% probability of occuring or being exceeded in any given year.

The home is located within the Severe Erosion Hazard Zone. This zone is comprised of the active watercourse channels and adjacent areas likely to be eroded during a single major event, such as the 100-year flood.

34
Mobile



NO.	REVISIONS	DATE	BY	CHK.
XS826.DWG				

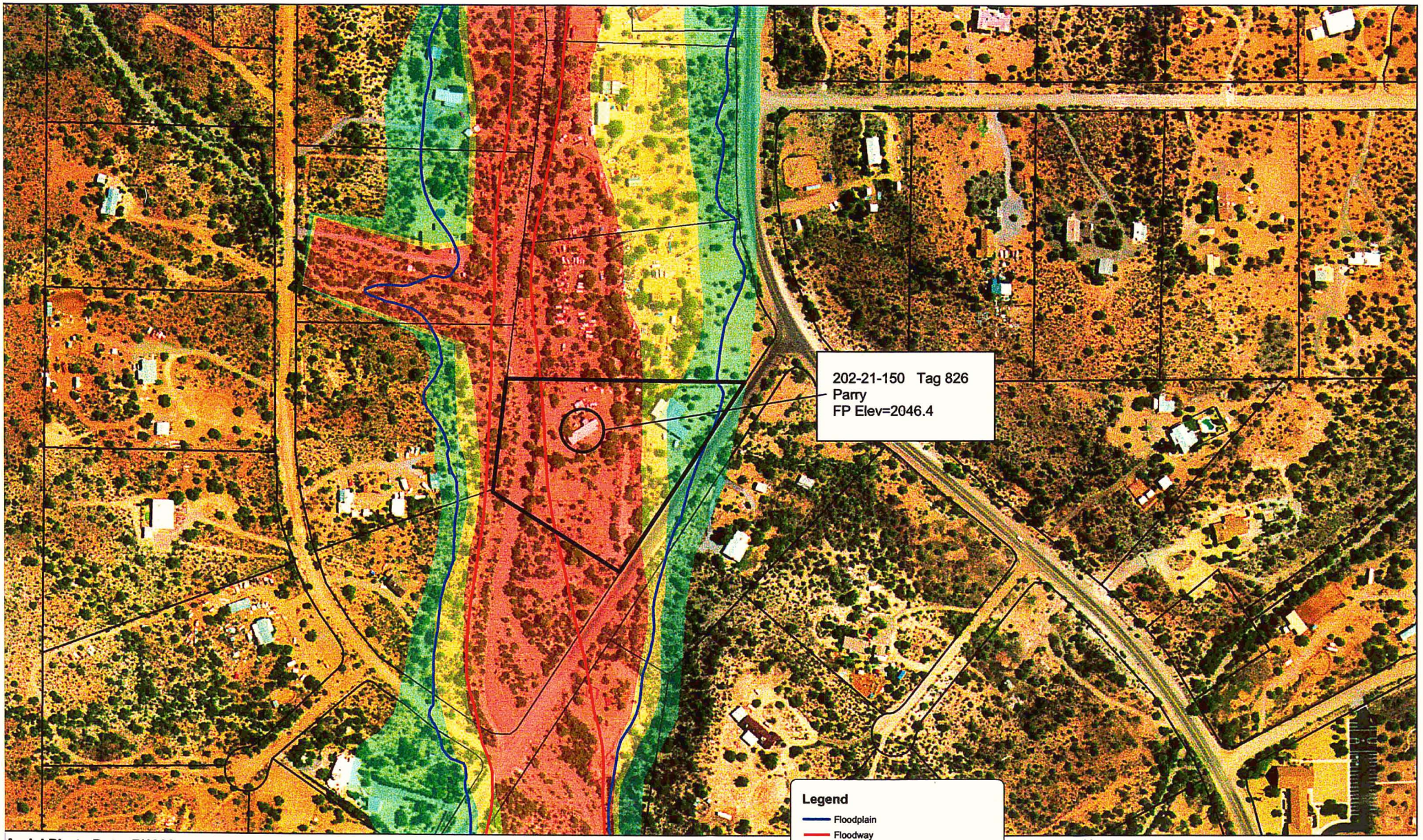
TETRA TECH, INC.
INFRASTRUCTURE SOUTHWEST GROUP
501 North 44th Street, Suite 125, Phoenix, AZ 85008
(602) 629-1100 FAX (602) 629-1186

SKUNK CREEK PHASE II
WATERCOURSE MASTER PLAN

JOB NO.	2350.0002
DESIGNED BY:	LML
DRAWN BY:	LML
CHECKED BY:	TRL
APPROVED BY:	TRL
DATE:	

STRUCTURE CROSS SECTION
Owner: PARRY
Cross Section: 34

SCALE: HORIZ: 1"= 200'
CONT. INTERVAL =
DRAWING NO.
SHEET NO. OF:



Aerial Photo Date: 7/1999

Legend

- Floodplain
- Floodway
- Severe Erosion Hazard Zone
- Lateral Migration Erosion Hazard Zone
- Long Term Erosion Hazard Zone

N

Scale: 1"=200'

Tetra Tech, Inc.
Infrastructure Southwest Group
4801 East Washington Street Suite 240, Phoenix, Arizona 85034
(602) 483-3380 Fax: (602) 244-1164

FLOOD CONTROL DISTRICT
of
Maricopa County

2801 West Durango Street • Phoenix, Arizona 85009-6399
Telephone (602) 506-1501
Fax (602) 506-4601
TT (602) 506-5897

BOARD OF DIRECTORS
Jan Brewer
Fulton Brock
Andrew Kunasek
Don Stapley
Mary Rose Garrido Wilcox

August 6, 2001

Mr. and Mrs. James and Wanda Sartain
43020 North 3rd Avenue
New River, AZ 85087

Dear Skunk Creek Property Owner,

I am writing to you as a representative of the Flood Control District of Maricopa County (District). I am the Project Manager for the Skunk Creek Watercourse Master Plan project currently in progress. Your home has been identified as being located within the regulatory *floodway* and/or the *Severe Erosion Hazard Zone* of Skunk Creek, either wholly or in part.

The *floodway* is defined by the Federal Emergency Management Agency (FEMA) as an area that is reserved for conveyance of floodwaters. It is usually a smaller area than the *floodplain*, which is the entire area that is flooded as a result of a 100-year storm. A 100-year storm is one that has a 1% chance of occurring or being exceeded in any given year. During extreme rainfall events, such as the 100-year storm, the *floodway* carries most of the flow in the stream. This makes it a high hazard area, where the safety of residents is threatened, in addition to the possibility of significant structural damage.

In addition to flood hazards, we have also identified three *erosion hazard zones,* which are shown on the aerial photograph. In desert washes such as Skunk Creek, a single major storm can result in significant bank erosion along the channel and undermine the foundations of nearby structures. *The Severe Erosion Hazard Zone* defines the area most likely to be eroded during a single major event, such as the 100-year flood. The area within the *Lateral Migration Erosion Hazard Zone* is the area likely to be eroded by a series of "typical" floods over the next 60 years, including a single major event such as the 100-year flood. It is representative of the area subject to lateral movement of the main channel of Skunk Creek. The *Long-Term Erosion Hazard Zone* includes the area that shows geological evidence of channel movement over the past 60 to 1,000 years, and represents the area of potential channel movement over the next 60 to 1,000 years in the future.

The *Severe Erosion Hazard Zone* and the *Lateral Migration Erosion Hazard Zones* are new regulatory areas, under the administration of the Flood Control District of Maricopa County, similar to the 100-year *floodway*. The *Long-Term Erosion Hazard Zone* is not a regulatory area. It is provided for information only.

We have been meeting with other property owners with homes located within the *floodway* and/or *Severe Erosion Hazard Zone* who responded to previous mailings or attended a public meeting that was held in the area. During the meetings, we review *floodway* hazard information specific to each property. The purpose of this mailing is to provide you with the same information concerning your property.

Included in this packet you will find:

1) A Floodplain Status Information Sheet for your parcel of land, identified by Maricopa County Assessor Parcel Number.
2) An aerial photograph of your property taken in May 1999.
3) A cross section plot of Skunk Creek taken through your home or other structure on your property.
4) A Skunk Creek Peak Flow Data sheet for a stream flow gage at the Skunk Creek crossing of Interstate 17.

The Floodplain Status Information Sheets list the flooding and erosion hazard status of each significant structure on your property. The depth of flooding in the structure is shown for the 100-year flood, as well as an estimate of the amount of flow it would take in Skunk Creek to start flooding the structure. In some cases, this is much less than a 100-year flood. The aerial photograph shows the boundaries of the 100-year *floodway* and *floodplain* relative to your property.

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The Skunk Creek Peak Flow Data sheet shows the historical record of high flows in Skunk Creek from 1959 through 1999. This data was recorded by the U.S. Geological Survey at a monitoring station just east of I-17. For comparison, the peak flows for the 100-year, 25-year, 10-year, 5-year, and 2-year storms are also shown. The highest flow recorded in Skunk Creek during this time period is less than a 25-year flood, or a flood that has a 4% probability of occurring or being exceeded in any given year.

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If approved by the Flood Control Advisory Board and the Maricopa County Board of Supervisors, homeowners would be given the choice of staying where they are or selling the property for fair market value. Under an acquisition scenario, the District would then demolish structures on the property and return it to as close to natural conditions as possible.

We would be happy to meet with you to discuss the information presented in this packet, or any other concerns you may have concerning flood and erosion hazards to your property. If you would like to schedule a meeting, or have any other questions, please call.

Sincerely,

MDeRosa

Marilyn DeRosa, RG
Planning Project Manager

enclosures

Floodplain Status Information Sheet

Parcel Number: 202-21-031Q
Owner: Sartain
Address: 43020 N. 3rd Ave.
New River, AZ 85087
Phone: (623) 465-7749

Project Tag ID # 639

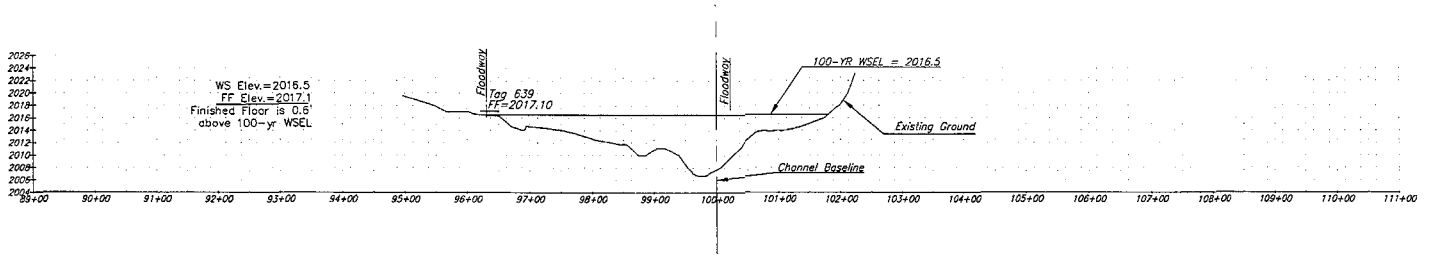
Structure	House	Building	
Cross Section #	23	---	
Approximate River Mile	23.83	23.83	
Existing Condition 100-yr Flow [cfs]	11,800	11,800	
Existing Condition 100-yr Water Surface Elevation [ft]	2016.5	2016.5	
Finished Floor Elevation (FFE) [ft]	2017.1	2019.2	
Depth of Water Above Finished Floor [ft]	-0.6	-2.7	
Flow Required to Reach FFE [cfs] (for mobile homes, flow required to reach ground underneath home)	---	---	
Approx. Storm Return Interval Required to Reach FFE (or ground beneath mobile homes)	>100-yr	>100-yr	
Is Structure Within Floodway?	Yes	No	
Erosion Hazard Zone	Lateral Migration	Long Term	

Summary of Findings

The house on this parcel is located within the FEMA 100-year floodway. The other building is located outside of the floodway, but within the floodplain. The finished floor elevation of both structures is above the 100-year floodwater surface.

The house is located within the Lateral Migration Erosion Hazard Zone. The danger of erosion in this zone is less than in the Severe Erosion Hazard Zone, but could occur at some point within the next 60 years. The other building is located within the Long Term Erosion Hazard Zone. The danger of erosion in this zone is less than in the Severe or Lateral Migration Erosion Hazard Zones, but could occur at some point over the next 60 to 1,000 years.

23
House



NO.	REVISIONS	DATE	BY	CHK.

X5639.DWG

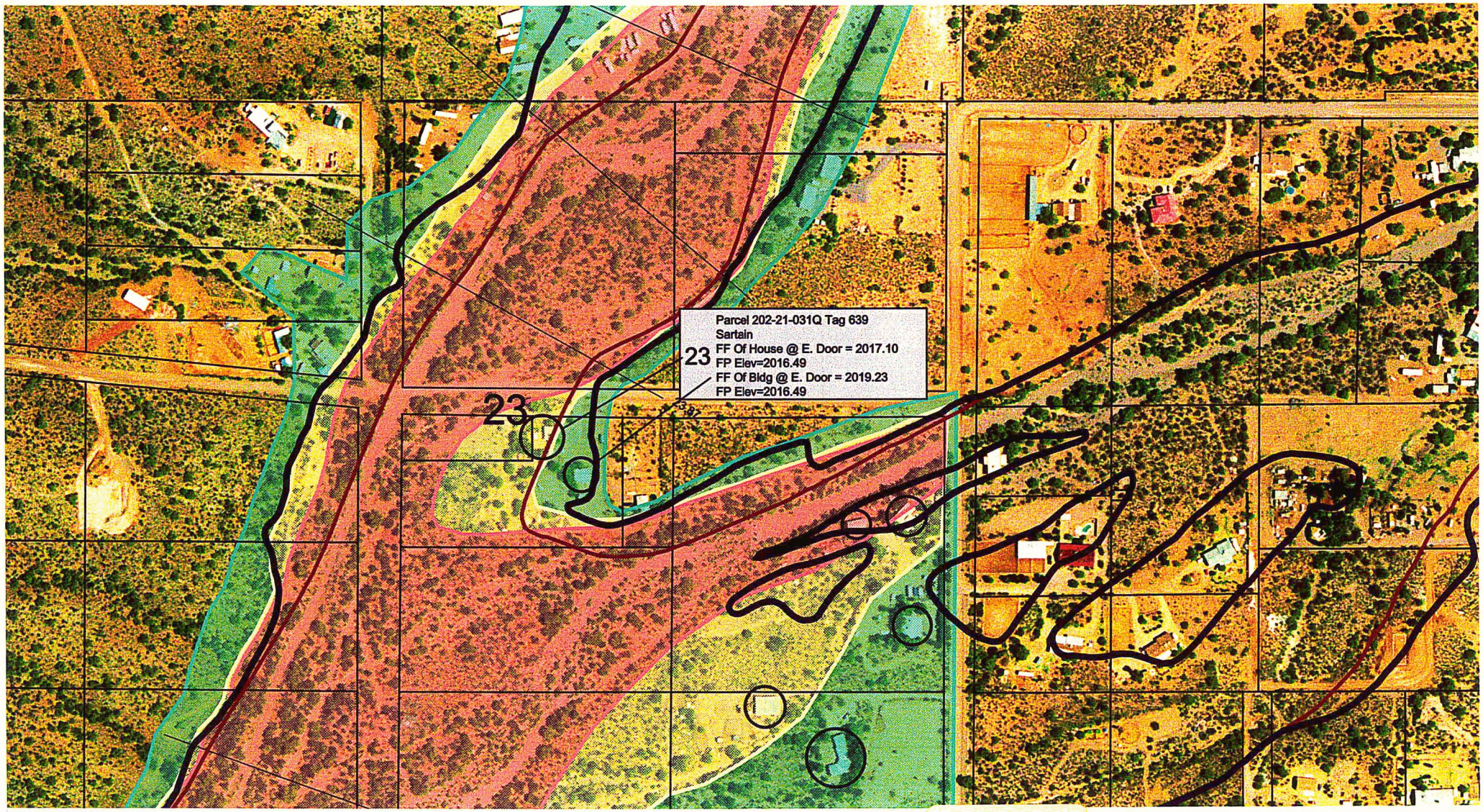
TETRA TECH, INC.
INFRASTRUCTURE SOUTHWEST GROUP
501 North 44th Street, Suite 125, Phoenix, AZ 85008
(602) 629-1100 FAX (602) 629-1186

SKUNK CREEK PHASE II
WATERCOURSE MASTER PLAN

JOB NO.	2350.0002
DESIGNED BY:	LML
DRAWN BY:	LML
CHECKED BY:	TRL
APPROVED BY:	TRL
DATE:	

STRUCTURE CROSS SECTIONS
Owner: SARTAIN
Cross Section: 23

SCALE: HORIZ: 1" = 200'
CONT. INTERVAL -
DRAWING NO.
SHEET NO. OF:



AERIAL PHOTO DATE: 7/1999

LEGEND

- Severe Erosion Hazard Zone
- Lateral Migration Erosion Hazard Zone
- Long Term Erosion Hazard Zone
- Floodplain
- Floodway

N

Scale: 1"=200'

TETRA TECH, INC
INFRASTRUCTURE SOUTHWEST GROUP
[illegible] North 44th Street, Suite 125, Phoenix, AZ [illegible]
([illegible]) [illegible]-1100 FAX ([illegible]) [illegible]-1105

FLOOD CONTROL DISTRICT
of
Maricopa County

2801 West Durango Street • Phoenix, Arizona 85009-6399
Telephone (602) 506-1501
Fax (602) 506-4601
TT (602) 506-5897

BOARD OF DIRECTORS
Jan Brewer
Fulton Brock
Andrew Kunasek
Don Stapley
Mary Rose Garrido Wilcox

August 6, 2001

Mr. Charles Selleys
43850 North 3rd Avenue
New River, AZ 85087

Dear Skunk Creek Property Owner,

I am writing to you as a representative of the Flood Control District of Maricopa County (District). I am the Project Manager for the Skunk Creek Watercourse Master Plan project currently in progress. Your home has been identified as being located within the regulatory *floodway* and/or the *Severe Erosion Hazard Zone* of Skunk Creek, either wholly or in part.

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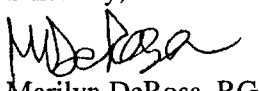

Marilyn DeRosa, RG
Planning Project Manager

enclosures

FLOOD CONTROL DISTRICT
of
Maricopa County

2801 West Durango Street • Phoenix, Arizona 85009-6399
Telephone (602) 506-1501
Fax (602) 506-4601
TT (602) 506-5897

BOARD OF DIRECTORS
Jan Brewer
Fulton Brock
Andrew Kunasek
Don Stapley
Mary Rose Garrido Wilcox

August 6, 2001

Mr. Charles Selleys
43826 North 3rd Avenue
New River, AZ 85087

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Sincerely,

Marilyn DeRosa, RG
Planning Project Manager

enclosures

Floodplain Status Information Sheet

Parcel Number: 202-21-031C
Owner: Selleys
Address:

Phone:

Project Tag ID # 634

Structure	House	Building #1	Building #2
Cross Section #	28	---	---
Approximate River Mile	Cline 0.341	---	---
Existing Condition 100-yr Flow [cfs]	16,700	16,700	16,700
Existing Condition 100-yr Water Surface Elevation [ft]	2024.8*	---	---
Finished Floor Elevation (FFE) [ft]	not surveyed	not surveyed	not surveyed
Depth of Water Above Finished Floor [ft]	---	---	---
Flow Required to Reach FFE [cfs] (for mobile homes, flow required to reach ground underneath home)	---	---	---
Approx. Storm Return Interval Required to Reach FFE (or ground beneath mobile homes)	---	---	---
Is Structure Within Floodway?	Yes		
Erosion Hazard Zone	Long Term	Lateral Migration	Severe

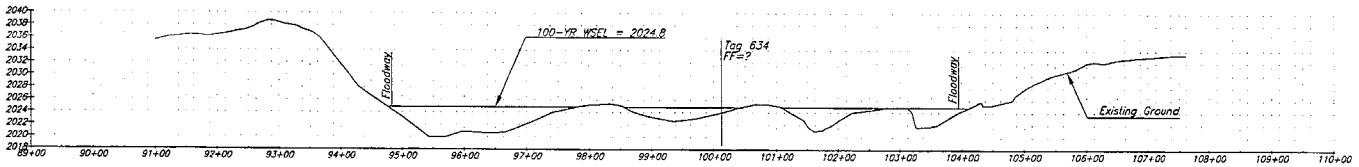
* Water surface elevation was interpolated between HEC-RAS model cross sections

Summary of Findings

The house on this parcel is located within the FEMA 100-year floodway. No finished floor survey data was available, so the depth of possible flooding within the house is unknown.

The house is located within the Long Term Erosion Hazard Zone. The danger of erosion in this zone is less than in the Severe or Lateral Migration Erosion Hazard Zones, but could occur at some point over the next 60 to 1,000 years. Two other structures on the parcel are located within the Severe and Lateral Migration Erosion Hazard Zones. The Severe Erosion Hazard Zone has the highest risk, and is comprised of the active watercourse channels and adjacent areas likely to be eroded during a single major event, such as the 100-year flood. The danger of erosion in the Lateral Migration Erosion Hazard Zone is less than in the Severe Erosion Hazard Zone, but could occur at some point within the next 60 years.

28
House



NO.	REVISIONS	DATE	BY	CHK.

K5634.DWG

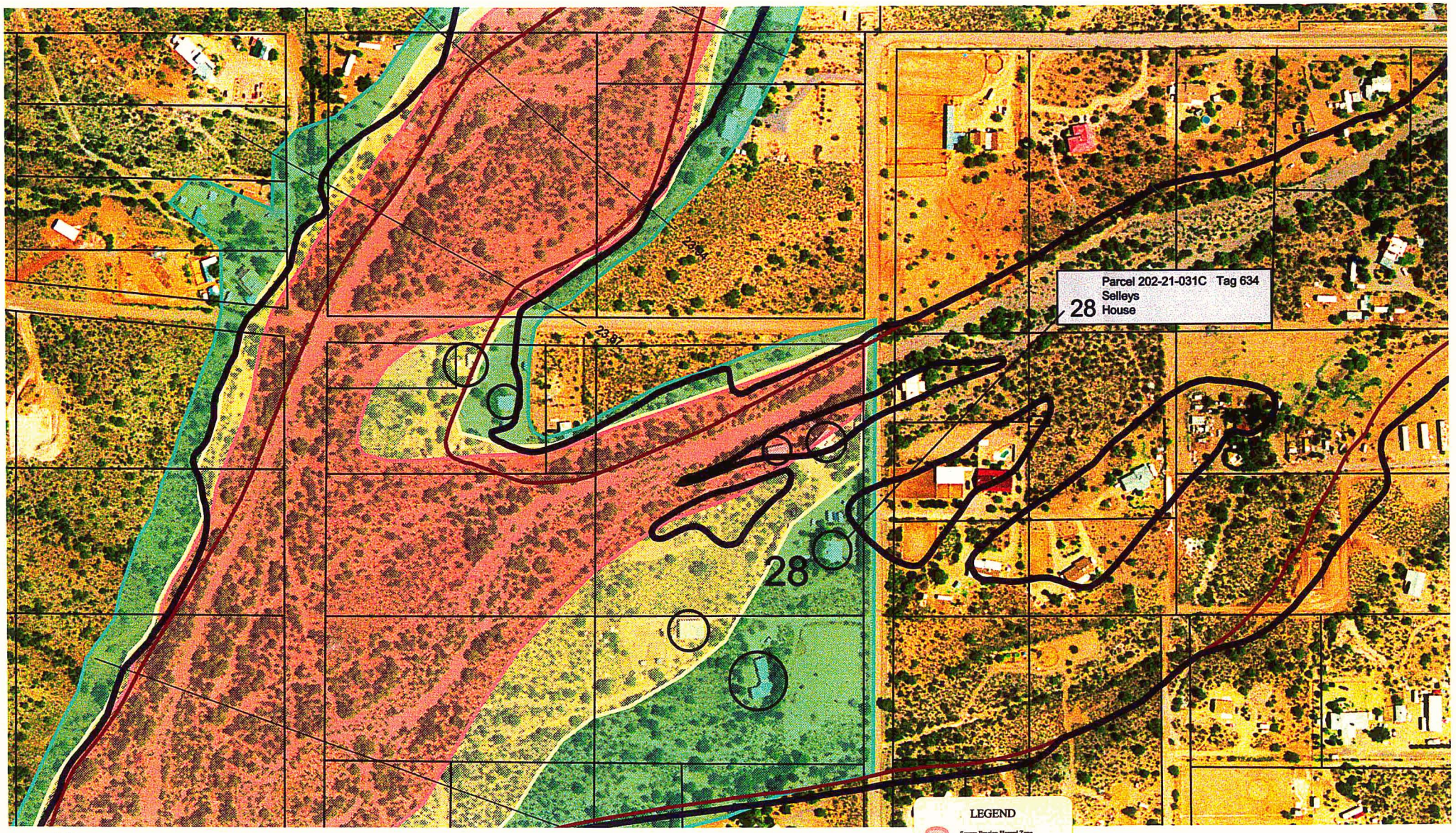
TETRA TECH, INC.
INFRASTRUCTURE SOUTHWEST GROUP
50 North 44th Street, Suite 125, Phoenix, AZ 85008
(602) 629-1100 FAX (602) 529-1186

SKUNK CREEK PHASE II
WATERCOURSE MASTER PLAN

JOB NO.	2350.0002
DESIGNED BY:	LML
DRAWN BY:	LML
CHECKED BY:	TRL
APPROVED BY:	TRL
DATE:	

STRUCTURE CROSS SECTIONS
Owner: SELLEYS
Cross Section: 28

SCALE: HORIZ: 1" = 200'
CONT. INTERVAL =
DRAWING NO.
SHEET NO. OF:



AERIAL PHOTO DATE: 7/1999

Exhibit 1

Map of Parcel Boundaries
for Skunk Creek WCMP
Phases 1 & 2

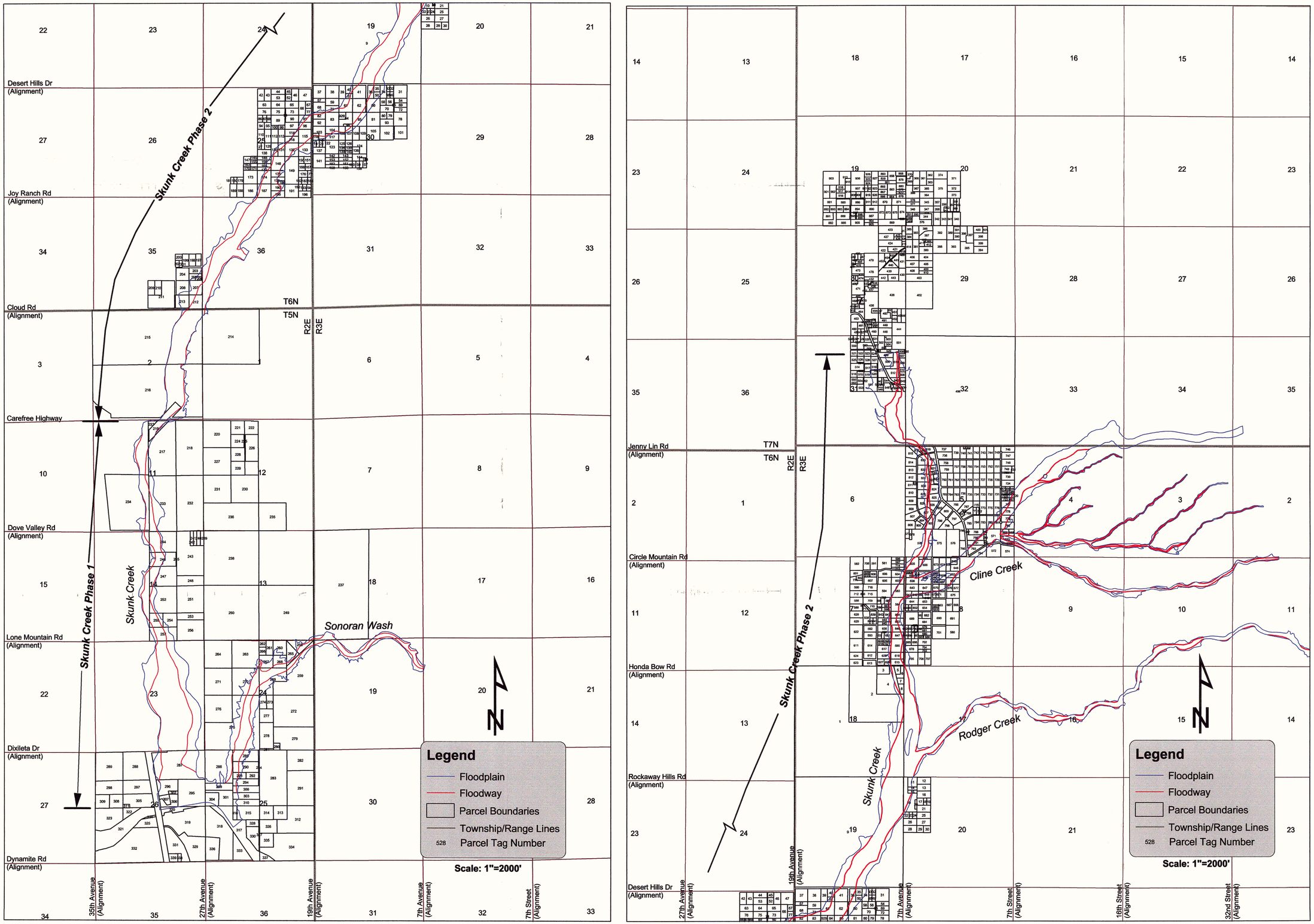


EXHIBIT 1

Map of Parcel Boundaries for Skunk Creek Watercourse Master Plan Phases 1 and 2

Tetra Tech, Inc.
Infrastructure Southwest Group
4801 East Washington Street Suite 260, Phoenix, Arizona 85034
(602) 682-3300 Fax: (602) 244-1164