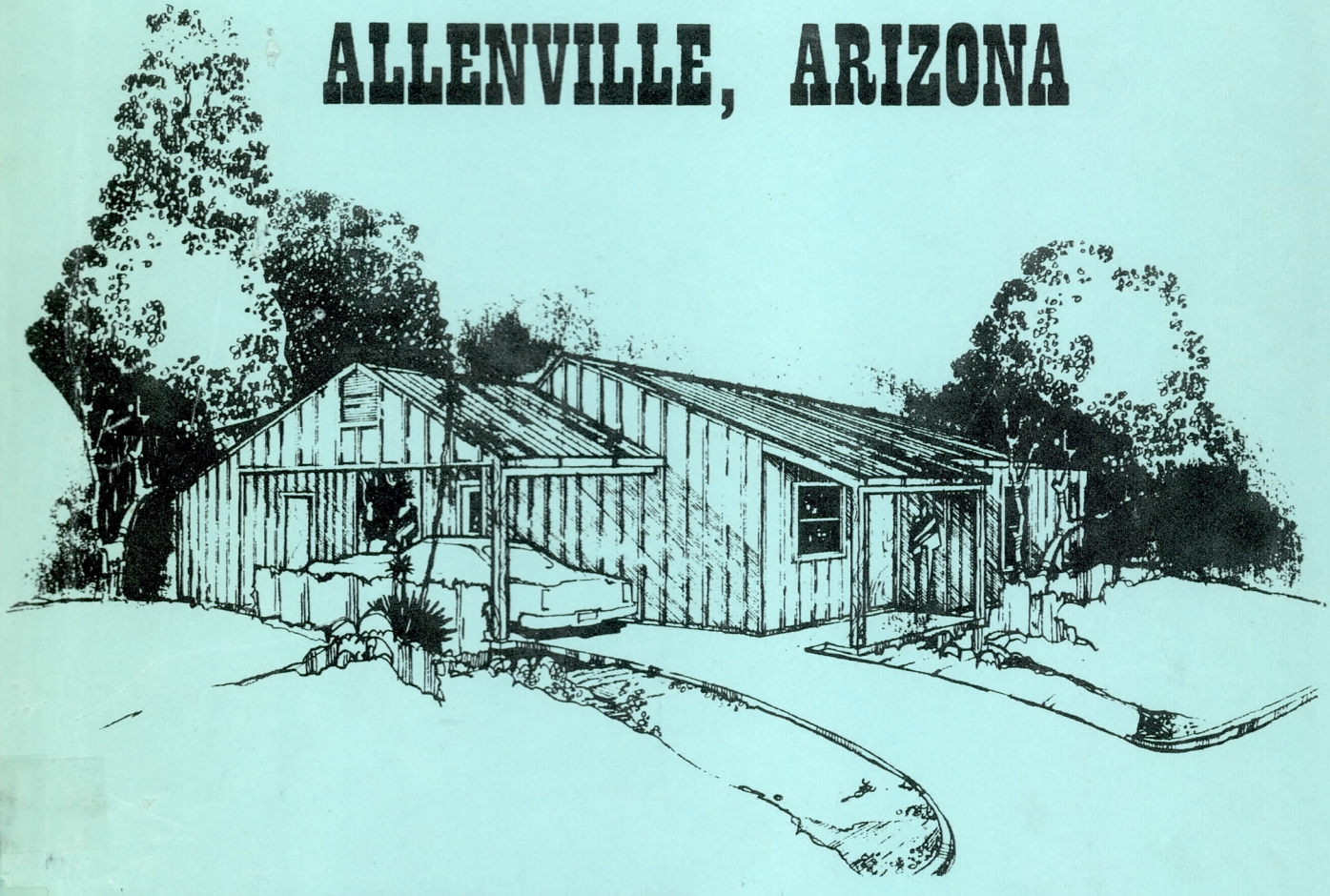
DETAILED PROJECT REPORT

Main Report ~ Technical Appendixes and Environmental Assessment

STUDY of FLOOD DAMAGE REDUCTION for ALLENVILLE, ARIZONA



U. S. ARMY ENGINEER DISTRICT
LOS ANGELES
CORPS OF ENGINEERS
SEPTEMBER 1980

FINAL

DETAILED PROJECT REPORT

STUDY OF FLOOD DAMAGE REDUCTION FOR ALLENVILLE, ARIZONA

MAIN REPORT, TECHNICAL APPENDIXES, AND ENVIRONMENTAL ASSESSMENT

U.S. Army Engineer District
Los Angeles
Corps of Engineers
September 1980

MAIN REPORT

AND

TECHNICAL APPENDIXES

STUDY OF FLOOD DAMAGE REDUCTION FOR ALLENVILLE, ARIZONA

TABLE OF CONTENTS

LIST OF TABLES

LIST OF PLATES

LIST OF APPENDIXES

Devastated Allenville After the Floods of 1978.

EXECUTIVE SUMMARY

Allenville, Arizona is a small community located on the Gila River 1.5 miles south of Buckeye and 35 miles west of Phoenix. Flooding of the Gila in March and December 1978 forced residents of Allenville from their homes. These people are presently living in a mobile home park developed with Department of Housing and Urban Development funds and designed as temporary housing after the flood of March 1978. The community has been waiting for the State of Arizona to provide permanent relief from flooding.

The Arizona State Division of Emergency Services requested that the Los Angeles District of the Corps of Engineers investigate the flooding problems at Allenville with a view toward assisting in reducing flood damages to the community.

A number of structural and nonstructural alternatives initially was considered by the Corps, and four appeared to warrant further study. The four alternatives included: 1) channel clearing of the Gila River in the vicinity of Allenvile, 2) a levee to protect the community, 3) flood proofing by raising the community above the 100-year flood level, and 4) permanent evacuation or relocation of the residents out of the floodplain. Of these, relocation was determined to be the only economically justified alternative for flood damage reduction. Two relocation plans were studied in detail: 1) individually relocating the residents to dwellings in the Buckeye Valley or metropolitan Phoenix, and 2) constructing a replacement community outside the floodplain. The first plan was rejected because of a lack of suitable and affordable housing in the area, and because it would have destroyed the unique community cohesion which has developed in Allenville. The second plan is the selected plan, because it both eliminates flood damages and preserves community cohesion. It is the economically justified alternative favored by the residents of Allenville.

The District Engineer, therefore, recommends:

That the Chief of Engineers adopt a project for the reduction of flood damages at Allenville through relocation of the community out of the Gila River floodplain in accordance with the selected plan described in this Detailed Project Report, and in accordance with the authority contained in Section 205 of the Flood Control Act of 1948 (33 U.S.C. 701s). The cost will be shared 80 percent by the Federal government and 20 percent by the State of Arizona. The estimated cost to the United States will be $2,866,000.

STUDY AUTHORITY

The Study of Flood Damage Reduction for Allenville, Arizona is being carried out under provisions of Section 205 of the Flood Control Act of 1948 (33 U.S.C. 701s) which states:

> That the Secretary of the Army is hereby authorized to allot from any appropriations heretofore or hereafter made for flood control ... for the construction of small flood control projects not specifically authorized by Congress, and not within areas intended to be protected by projects so authorized, which come within the provisions of Section 1 of the Flood Control Act of June 22, 1936, when in the opinion of the Chief of Engineers such work is advisable ...

This legislation has since been amended to increase the amount of money available to the Secretary of the Army for small flood control projects. Two recent amendments directly affect the Allenville Study: PL 93-251 increased the fiscal year allotment to $30,000,000, and increased the required allotment to $2,000,000 for a project at a single locality declared to be a major disaster area pursuant to Disaster Relief Act of 1966 or Disaster Relief Act of 1970. PL 94-587 increased the limitation on the allotment for a project at a single locality from $1,000,000 to $2,000,000 and for a project protecting a major disaster area from $2,000,000 to $3,000,000.

On December 21, 1978 President Carter designated Maricopa County, Arizona a major disaster area, thereby making a small project at Allenville eligible for the maximum Federal $3,000,000 allotment.

Certain alternatives considered by the Corps of Engineers in the Allenville study are governed by Section 73b of the 1974 Water Resources Act (33 U.S.C. 7016-11) which states:

> Where a nonstructural alternative is recommended, non-Federal participation shall be comparable to the value of lands, easements, and rights of way which would have been required of non-Federal interests under Section 3 of the Act of June 27, 1936 (Public Law Numbered 738, Seventy-fourth Congress), for structural protection measures, but in no event shall exceed 20 per centum of the project costs.

In addition to these measures, Public Law 91-646, the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, and Public Law 91-611, the Flood Control Act of 1970, contain provisions which affect alternatives examined in this Detailed Project Report.

SCOPE OF THE STUDY

The Study of Flood Damage Reduction for Allenville, Arizona is being carried out at a site on the Gila River, 1.5 miles south of Buckeye and 35 miles west of Phoenix, in Maricopa County. The community of Allenville has no formal corporate limits, although it occupies a distinct

geographical area. It is bordered on the south by the Gila River, on the north by agricultural fields and the Town of Buckeye's sewage treatment plant, on the east by desert growth and dense tamarisk thickets, and on the west by agricultural fields. For purposes of this Detailed Project Report, Allenville is viewed as both a geographical and demographic unit. Persons are considered residents only if they lived in the community prior to the flood of March 1978.

The Allenville study has been pursued at a level sufficient to accomplish plan formulation and develop details of the plans.

STUDY PARTICIPANTS AND COORDINATION

The Allenville study was undertaken by the Corps as a result of a request from the Arizona State Division of Emergency Services, and from the outset has been a cooperative venture with the State. The Corps, therefore, has carried out extensive coordination with the State through the Division of Emergency Services.

On November 13, 1979, a meeting of the Western Federal Regional Council was held in San Francisco. The recommendation resulting from this conference, presented at a meeting with Governor Babbitt of Arizona in Phoenix on November 15, was that the Department of Housing and Urban Development (HUD) and the Farmers Home Administration (FmHA) could be of assistance to residents of old Allenville who had been renters prior to the 1978 floods. It also was decided that the Corps would remain the lead agency in the project and that coordination among the agencies would be carried out by representatives at the local level.

Acting through the Division of Emergency Services, the State will be the sponsor of the Allenville project. Coordination has also been carried out with the Arizona State Land Department with regard to a land exchange.

Because the study area lies within the jurisdictional limits of Maricopa County, the Corps has coordinated with agencies of the County. In particular, it was recognized that a flood damage reduction project at Allenville could affect, or be affected by programs of the Flood Control District of Maricopa County (FCDMC) discussed later in this report.

Since Allenville is an unincorporated community, no town government, as such, exists with which to coordinate. There is, however, an organization known as Allenville Community for Progress, Inc., which provides leadership. Both the Corps and the State have coordinated informally with Allenville Community for Progress, Inc. A petition dated October 1979, and signed by 67 percent of the residents designated the board of directors of the Allenville Community for Progress, Inc. as their representative in matters pertaining to the study. Both the Corps and State will continue to work closely with this organization.

PUBLIC INVOLVEMENT

The role of public involvement in the Corps of Engineers' planning process for the Allenville study is to provide timely information so that the Corps' water resource plans will respond to public needs and preferences. The Corps also has the responsibility of providing the public information to acquaint persons desiring to participate in the study effort with the issues and opportunities associated with a particular project or program. The Corps, together with elected and appointed officials, on the other hand, still retains the major decision-making authority. It must balance the needs and preferences of many groups with each other, as well as with the technical and political elements which may influence the selection of a plan. Public involvement, therefore, is basically a two-way communication process in which the public relates to the Corps the particular problems, needs, and concerns of a study area, and the Corps, in turn, informs the public about the various technical, environmental, political, and economic issues involved in planning for water resources.

Definition of Publics

For the purpose of the Study of Flood Damage Reduction for Allenville, Arizona, the term "Public" describes any entity other than the Corps and the State Division of Emergency Services staffs directly involved in the study. The public can be identified as several groups to illustrate the broad sense of this definition.

- Governmental Sector. This group includes elected officials and agency representatives at the Federal, State, and local levels. It also includes public utility companies, irrigation districts, and special purpose governments such as flood control districts;

- Special Interest Groups. Included in this classification are special interest organizations, such as environmental groups, and residents' associations, such as the Allenville Community for Progress, Inc.;

- General Public. This includes everyone affected by the study. Of particular interest, however, are property owners outside of Allenville who could be affected by courses of action contemplated by the study.

Objective

The objective of the Allenville public involvement program was to provide a continuous two-way communication process which would:

- Promote full understanding of the manner and means by which the problems and needs are investigated and solutions are proposed;

- Provide an opportunity for a variety of interests within the community to understand diverse viewpoints and resolve possible conflicts;

- Allow residents to present their ideas and viewpoints regarding designs of the replacement community.

Program Overview

To meet the objectives of the Allenville public involvement program, activities were conducted appropriate to plan development. Rather than being a fixed program, public involvement was flexible and monitored for effectiveness as the study progressed. The public involvement program, as a vehicle for discussion of community desires, provided the opportunity of obtaining information concerning the acceptability of alternative plans.

In January 1979 coordination on Allenville between the State of Arizona and the Federal Disaster Assistance Administration (FDAA) began with meetings between State officials, the FDAA, and a representative of the Allenville community. The public involvement program began with the preparation in July 1979 of the Reconnaissance Report, Small Flood Control Project Authority, Gila River Basin, Allenville, Arizona by the Los Angeles District of the Corps of Engineers. This document contained background data and presented initial alternatives for the alleviation of Allenville's flooding problems.

Following publication of the Reconnaissance Report, a survey conducted by the State indicated that almost all of the residents of Allenville favored the evacuation alternative. On September 19, 1979, a meeting of Allenville residents was held in Buckeye, Arizona with representatives of the Corps and State to discuss the alternatives. A leaflet summarizing the study and alternatives was then prepared by the Corps of Engineers and distributed to Allenville residents and other concerned citizens, agencies, and organizations. This was followed by a formal public meeting September 28, 1979, at the Buckeye Union High School Auditorium, at which results of the study to date were presented, questions were answered, and comments noted. One workshop was conducted on October 23, 1979, in Allenville by the State's Architect-Engineer and attended by members of the Corps and State study teams to present descriptions of the relocation site plans in detail and solicit the ideas and preferences of the evacuees regarding the new location, and housing designs. Following this, two petitions were circulated among Allenville residents. These stated that the residents favored relocation as a community and acknowledged the Board of Directors of the Allenville Community for Progress, Inc. as their spokesman on matters pertaining to the community. A second public workshop was held in Allenville on January 24, 1980, to bring the residents up to date on the planning process and to discuss with them the preliminary designs and costs of homes at the new site. The final public meeting was held on the evening of April 2, 1980 at the Buckeye Elementary School Cafetorium. Findings of the Detailed Project Report were summarized. A question and answer period followed, during which concerns of residents of the Buckeye area regarding the community relocation alternative were addressed.

PREVIOUS STUDIES

In 1957, the Los Angeles District of the Corps of Engineers published the findings of a study of flooding problems along the Salt-Gila River system. This report resulted in the authorization of a project to reduce flood damages consisting of a single levee along the north bank of the Salt River from Tempe Butte to 40th Street and a cleared channel 2,000 feet wide from the confluence of the Salt and Verde Rivers to Gillespie Dam on the Gila. The initial cost of the project as authorized was estimated at $3,570,000. Background and technical information presented in this report has been used in preparing this DPR*. The flood damage reduction project for Allenville will not supplant the 1957 project.

Although authorized and listed in the active category, the 1957 project has not been implemented because of subsequent authorization of the Central Arizona Project (CAP) to be constructed by the Water and Power Resources Service. A feature of the CAP was to have been Orme Dam, located at the confluence of the Salt and Verde Rivers. As authorized, this structure would have reduced floodflows through the study area significantly. Local reaction to the draft environmental statement for Orme Dam, President Carter's recommendation in April of 1977 to eliminate Orme Dam from the CAP, and the extensive floods of 1978 and 1979 have resulted in the initiation of a study of Orme Dam alternatives by the Water and Power Resources Service, assisted by the Corps of Engineers. The "Plan of Study" for the Central Arizona Water Control Study, prepared in January 1980, schedules the completion of the study in May 1982. The Plan of Study describes numerous alternatives. Among those pertinent to Allenville are the clearing of the channel, upstream flood control storage, a levee system, and relocation. The Formulation of Alternative Plans section of this report discusses these options. The Corps' flood damage report of February 1979, describing the floods in Maricopa County, Arizona, during the period of February 27th through March 6th, 1978, provides information on the subject floods and subsequent damage. The Flood Control District of Maricopa County (FCDMC) is currently conducting a study of the feasibility of channel clearing on the Gila River in the vicinity of Allenville, but there is no schedule set for completion of the project.

*Detailed Project Report

THE REPORT

The Detailed Project Report for Flood Damage Reduction at Allenville, Arizona (DPR) is composed of three main sections. The first consists of a description of the study area and an identification of the major problems to be addressed by the report. Also contained in this portion of the DPR are descriptions of the stages through which the formulation of preliminary alternatives progressed, and a presentation and evaluation of detailed plans, the views of concerned agencies and the public, a comparison of the National Economic Development (NED) and Environmental Quality (EQ) plans, conclusions, and recommendations.

The second portion of the DPR is a compilation of technical appendices. These cover the public views and responses, hydrology, design and cost data of the recommended plan, and economic data. The last appendix consists of a draft of the Section 221 Agreement between the Corps and the State of Arizona for permanent floodplain evacuation of Allenville, and a letter of intent by the local sponsor.

The third portion of the DPR consists of an environmental assessment. This section presents the results of environmental and socio-economic investigations of the study area, as well as impacts associated with the selected plan.

STUDY PROCESS

In general, the Corps of Engineers' planning process consists of the refinement of a large number of alternatives down to a few detailed plans and eventually to a recommended solution. During the planning process, the number of plans decreases while the level of detail at which they are examined increases.

The three basic planning stages are:

- Stage I, Delineation of Strategies. Efforts during Stage I center on the identification of problems and needs in the study area, establishment of broad planning objectives, definition of public concerns, and formulation of a management program for conduct of the study;

- Stage II, Formulation of Alternatives. The planners and engineers do the bulk fo their work in Stage II. Included in this stage are the detailed investigations of such factors as hydrology, hydraulics, costs, structural designs, and institutional analysis. Detailed environmental assessments and socio-encomic studies also are made. Stage II work eliminates non-viable plans, and formulates a limited number of alternatives for more detailed study in Stage III;

- Stage III, Refinement of Plans. Stage III includes the necessary modification of plans and designs based on economic, engineering, environmental, and social concerns during the review at the conclusion of Stage II. Emphasis is placed on a more thorough evaluation of these plans and the necessary arrangements for implementation.

Additionally, four tasks are accomplished within each planning stage. These four tasks are:

- Problem Identification;
- Formulation of Alternative Solutions;
- Impact Assessment;
- Evaluation.

Although all of these tasks are carried out in the three planning stages, the emphasis placed on them varies at each stage.

PROBLEM IDENTIFICATION

Study Area Location

Allenville is an unincorporated community located along the north boundary of the Gila River floodplain 1.5 miles south of the town of Buckeye, Arizona, and about 35 miles west of Phoenix. The 160-acre site is situated at approximately 890 feet above sea level. (See Plate 1.)

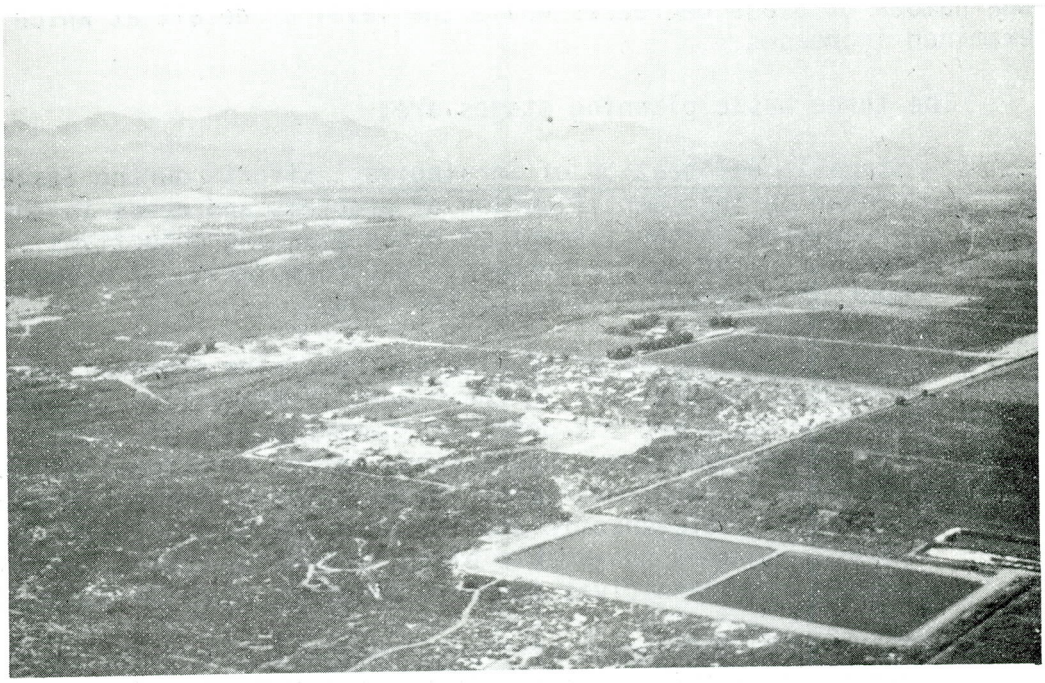
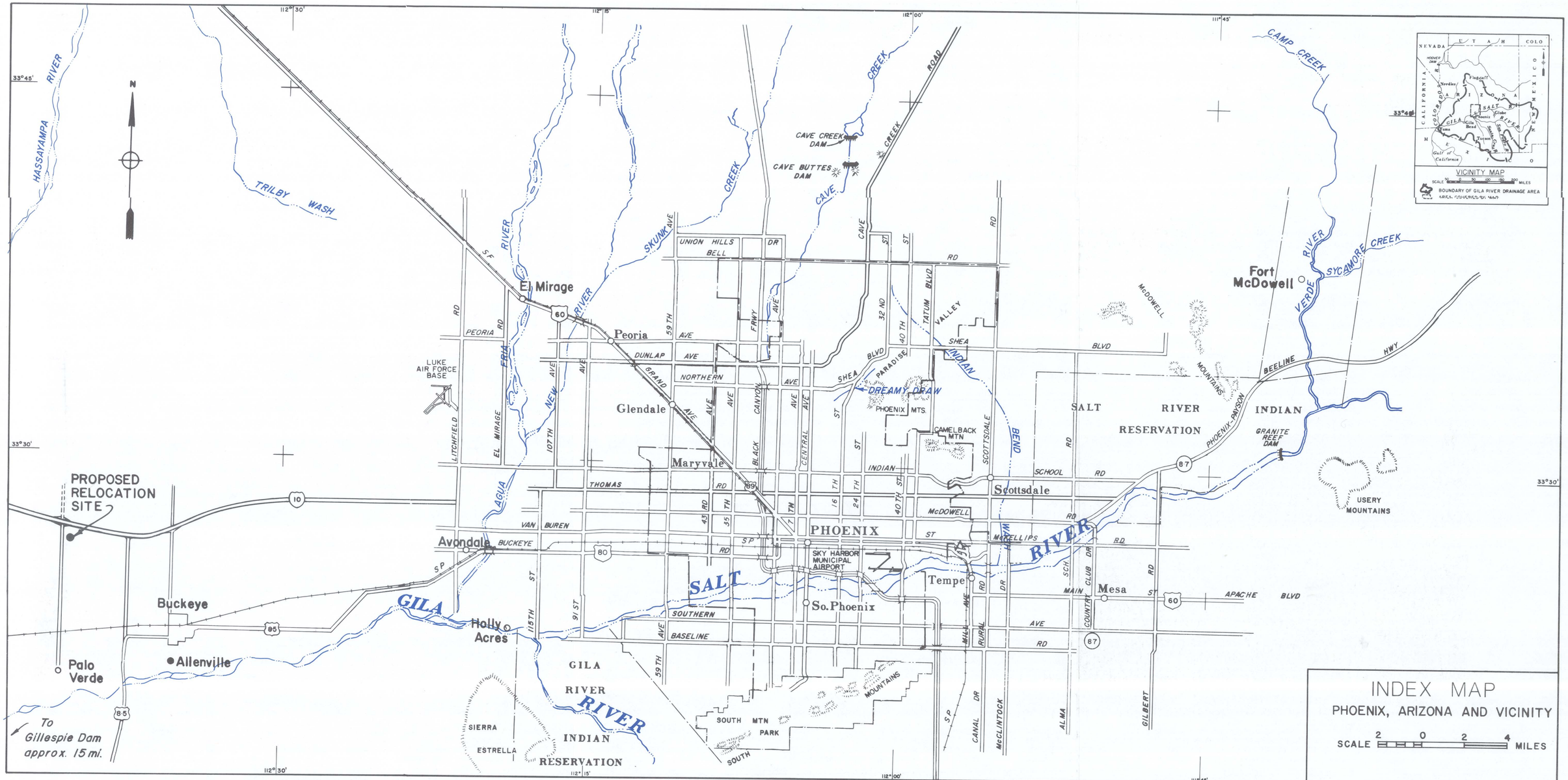


Figure 1. Aerial view showing Allenville in the center, with the Buckeye Sewage Treatment Plant in the lower right.


INDEX MAP
PHOENIX, ARIZONA AND VICINITY
SCALE 2 0 2 4 MILES
VICINITY MAP
BOUNDARY OF GILA RIVER DRAINAGE AREA
PROPOSED RELOCATION SITE
To Gillespie Dam approx. 15 mi.
El Mirage
Peoria
Glendale
Maryvale
Avondale
Buckeye
Palo Verde
Allenville
Holly Acres
PHOENIX
Tempe
So. Phoenix
Scottsdale
Mesa
Fort McDowell
SALT RIVER INDIAN RESERVATION
GILA RIVER INDIAN RESERVATION
LUKE AIR FORCE BASE
SKY HARBOR MUNICIPAL AIRPORT
USERY MOUNTAINS
SOUTH MTN PARK
PHOENIX MTS.
CAMELBACK MTN
GRANITE REEF DAM
CAVE CREEK DAM
CAVE BUTTES DAM
HASSAYAMPA RIVER
TRILBY WASH
AGUA FRIA RIVER
SKUNK CREEK
CAVE CREEK
CAMP CREEK
SYCAMORE CREEK
VERDE RIVER
SALT RIVER
GILA RIVER
NEW RIVER
DREAMY DRAW
BELL RD
UNION HILLS DR
PEORIA RD
DUNLAP AVE
GRAND AVE
NORTHERN AVE
THOMAS RD
VAN BUREN
BUCKEYE RD
SOUTHERN AVE
BASELINE RD
SHEA BLVD
McDOWELL RD
SCHOOL RD
MAIN ST
APACHE BLVD
BEELINE HWY
PHOENIX-PAYSON
INDIAN BEND
SCOTTSDALE RD
TATUM BLVD
PARADISE VALLEY
59TH AVE
43RD AVE
35TH AVE
27TH AVE
19TH AVE
16TH ST
24TH ST
40TH ST
32ND ST
40TH ST
91ST AVE
115TH AVE
LITCHFIELD RD
EL MIRAGE RD
107TH AVE
59TH AVE
CANYON
BLACK CANYON
CENTRAL AVE
RURAL RD
MILL AVE
SCH. RD
COUNTRY CLUB DR
CANAL DR
McCLINTOCK DR
ALMA SCH. RD
GILBERT RD
SIERRA ESTRELLA MOUNTAINS
SOUTH MOUNTAINS
McDOWELL MOUNTAINS
PHOENIX-PAYSON
10
17
60
85
80
87
112°30'
112°15'
112°00'
111°45'
33°45'
33°30'
N
PLATE I

Climate

The climate of the study area is arid and marked by low rainfall and extreme heat. The nearby town of Buckeye frequently records the highest temperature in the nation during the summer months. Daytime thermometer readings of over 100 degrees Fahrenheit are normal from June through September.

Precipitation in the study area is usually less than six inches per year. Winter rains occur from November through March. They are usually the result of cyclonic disturbances originating over the Pacific Ocean. These storms bring widespread, though often light, precipitation. The arrival over central Arizona of moist tropical air from the Gulf of Mexico in midsummer signals the start of the summer rainy season. This extends from July through September and is marked by localized heavy convective showers, thunderstorms and cloudbursts. These storms can result in periods of high winds, severe blowing dust, and flash flooding.

Physical Setting

The study area is located within the Basin and Range Physiographic Province of the Western United States, and is characterized by wide, flat, alluvium-filled valleys surrounded by rugged, low-relief mountain ranges. The area surrounding Allenville is an outwash plain, gently sloping south from the White Tank Mountains to the Gila River. With the exception of developed areas in the community, the land is devoted either to undeveloped desert or irrigated agriculture. The Gila River is the only surface water resource in the study area. Except during periods of floods, it maintains a base flow of effluent from the 91st Avenue wastewater treatment plant operated by the City of Phoenix. Many smaller ephemeral drainages have been obliterated by development and agricultural use.

Fish and Wildlife

Undeveloped areas within Allenville display a disturbed vegetative cover, predominately suaeda, shrub, and scattered saltbush. These areas have moderate value as habitat for quail, songbirds, rabbits, and small rodents.

Socio-economic Base Conditions

Allenville was founded in the early 1940s by John Allen who organized migratory black farm workers and offered them something better than life in a labor camp. Unable to reside in Buckeye because of restricted housing patterns, the workers constructed a cluster of shacks and huts south of town, which became known as Allenville. The 51 families comprising the community remain generally less affluent than most others in the area but most are proud of the fact that they own the land on which they live. Approximately one-third of the community is retired. There is strong community feeling. The socio-economic conditions of Allenville's history have created a close-knit society in which virtually every member of the community knows everyone else. The residents of Allenville are currently living in a mobile home park on the south edge of Buckeye.

This park, developed with funds from HUD and consisting of trailers, was designed for temporary housing after the March 1978 flood. Between March and December some families returned to their homes, and the remaining evacuees made preparations to return. Community activities were approaching normal when the December 1978 flood occurred. The community is now waiting for the State to provide promised guidance in relocation or other flood control alternatives.

Social Characteristics

The community is composed of 48 black and 3 Mexican-American households. There is a strong religious feeling as shown by the fact that this small community can support two churches. The Masonic Lodge has been active, drawing its membership from Phoenix as well as the Buckeye Valley. The Allenville Community for Progress, Inc., a non-profit corporation, has been in existence for 14 years. This community-minded group bought land and was responsible for the construction of a community center and a County park. A local State-supported day-care center serves working residents.

Land Use and Population

Most of the residents of Allenville live in single family dwellings. Many of the single family units in the community had vegetable gardens and chickens, reflecting the strong local sentiment for the rural lifestyle.

Land use is affected by a Maricopa County ordinance passed in 1974, and revised in 1975 and 1976, regulating construction in unincorporated areas of the County. This ordinance, in general, has restricted severely new construction in the 100-year floodplain. Nonetheless, the population has remained relatively constant for the last two decades. Notwithstanding this restriction, Allenville's leaders feel that the progress they have made to better the standard of living in the community, with such improvements as a community center, day-care center and the Allenville Water Co. Inc.'s well, would have resulted in growth of the community over the next ten years.

Housing

Much of the housing in Allenville was substandard even before the 1978 floods. There were 51 occupied dwellings in March 1978, when the first of the three most recent floods occurred. Thirty-one of these dwellings were owner occupied; twenty were rentals. These homes ranged from 2,200 square feet block construction to nothing more than a four-wall, single-room shack. One new home was under construction. All the homes received damage in the March and December floods of 1978 and many were damaged beyond repair.

Figure 2. Several buildings in Allenville suffered total devastation in 1978.

Economic Characteristics

Even before the floods of March and December 1978, there was very little commercial activity in the community. A tavern and the non-profit, State-supported day-care center were the primary sources of economic activity.

Allenville's median income is $7,073 yearly. One-third of the families earn incomes below poverty level. (See Table 1.) This compares with a median income of $9,853 and an 8.9 percent poverty rate in Maricopa County.* Only eight families in Allenville have an annual income of $12,000 or more. Nineteen households receive social security and three receive welfare payments.

TABLE 1

ANNUAL INCOME RANGE OF ALLENVILLE RESIDENTS PER HOUSEHOLD

Less than $3,000 per year	17
$ 3,000 - $ 7,999	11
$ 8,000 - $11,999	9
$12,000 - $14,999	2
More than $15,000	6
No answer	6

Source Survey - State Division of Emergency Services

*SOURCE: City and County Data Book, U.S. Department of Commerce 1977

Transportation

Allenville is situated two miles south of U.S. Highway 85. Five miles north of the community is Interstate 10 which can be reached by way of Miller Road. Both highways provide important regional access. The community's only effective mode of transportation is the private automobile. Allenville has no regular bus service. Southern Pacific freight lines run 1-½ miles north of the community of Buckeye, but the nearest depot is in Phoenix. Local air service is available by charter two miles northwest of the community. Many national air carriers serve Phoenix Sky Harbor International Airport, 35 miles to the east.

Cultural Resources

The Phoenix area contains archaeological resources associated with the Hohokam, a Native American culture which existed until about 1450 A.D. An archaeological overview of the region performed by Arizona State University rates the area south of Buckeye, near the Gila River, as having high archaeological sensitivity. A more detailed examination of the cultural resources of the study area is contained in the Environmental Assessment Report.

Conditions If No Federal Action Is Taken

If no Federal action is taken, a situation will develop posing a serious threat to the health and safety of Allenville's residents. Although the State of Arizona has indicated that it wishes to relocate the residents of the community out of the floodplain, no formal assurances to this effect have been made. Because many residents of Allenville cannot afford to move elsewhere, and because of the strong community sentiment, if the State reverses its position or if the process of relocation is delayed for an extended time period, displaced persons now living in mobile homes or residing in other locations would return to their former homes. The likelihood that this would occur is illustrated by the fact that residents of Allenville repaired and moved back to their homes after the March 1978 flood, and five households had returned to the floodplain after the December 1978 flood. As of this report, no residents have returned to Allenville following the February 1980 flood; however, if Allenville is reoccupied, the dangers to the lives and property of its residents from flooding and public health hazards will be substantial. Timely action to reduce flood damages at Allenville, therefore, is essential.

Rainswept Allenville is turned into muddy sea again

By ANN INSKEEP

ALLENVILLE — A steady drizzle Monday was turning Allenville into Mud City as residents packed their meager belongings into every available vehicle.

They had been told they would have to evacuate again, and this time they were determined to save what they could. Last March, they didn't have the chance.

"They're packing now," said Penny Wilmot as she emptied her kitchen cabinets into a cardboard box. "The last time, they didn't and they lost everything. It's terrible. I don't know what we're going to do."

Allenville, a small poverty pocket just south of Buckeye populated mainly by black farm laborers, was evacuated in March when floodwaters spread a thick layer of sludge throughout the community.

Homes and furnishings were ruined. Fifty families were relocated in a trailer court north of the community by the Department of Housing and Urban Development on land leased by Maricopa County.

In the past three months, about a dozen of those families have moved back to Allenville to rebuild their lives and homes, many with government help.

"We just moved back down here," said Richmond Lee as he surveyed a sea of mud surrounding his pre-fab shackle house. "I guess we'll have to go up to the trailers now."

Lee shook his head, and gestured toward a station wagon parked in the mud nearby, stuffed to the roof with household goods.

"Will the house move when the flood comes?" a child asked him.

"Did last time."

Inside the house — which still bears water stains three feet from the floor — an abandoned Christmas tree sat in an empty living room. Outside, some people talked in groups while others waded back and forth hauling cars and trucks. Most of them moved with an air of resigned acceptance.

"Some of them are only half moved in anyway," said Carl Pfifer, a Buckeye resident who came to help family and friends remove belongings. "Last time we had two families living in cars on the Buckeye. It'll be all right as long as they all have some place to go."

Two Red Cross shelters were set up in the area to accommodate evacuees. Allenville residents, use of Buckeye High School and one of Gladden High. By 7:30 p.m. Monday, refugees were beginning to arrive.

"We knew it was a flood area but we didn't realize it would happen again," Ms. Wilmot said. "We thought they were going to do something about the channel. We thought they wouldn't let people move back unless it was OK."

Last May, the Maricopa County Board of Supervisors voted to allow building permits for people whose homes were flooded out of Allenville. Supervisors Chairman George Campbell, who is opposed to letting people move back, said Monday: "It's too bad the board let us in for it."

Afternoon traffic detours a low spot filled with water at the river bottom and 4th Street.

Brenda Sims, 11, right, waits to leave as George Lee of Allenville packs the trunk of his automobile.

David Grayson of Allenville takes a look back at his home.

Figure 3. Allenville residents evacuate again in December 1978.

Problems and Needs

Problems and needs in the study area center around the necessity of reducing flood damages at Allenville, assuring an adequate water supply, preserving the unique cohesiveness of the community, maintaining recreational facilities for the residents, and protecting the natural resources of the region.

Flood Control

Flooding in Allenville is most often the result of spills from upstream reservoirs on the Salt, Verde, and Agua Fria Rivers following periods of rapid snowmelt on the watershed. Six dams on the Salt River and its tributary, the Verde, are non-Federal structures and are operated by the Salt River Project. (See Table 2.) Waddell Dam on the Agua Fria River also is a non-Federal structure and is operated by the Maricopa County Municipal Water Conservation District No. 1. These dams are designed for water storage only and have no dedicated flood control function. Waters from the Salt, Verde, and Agua Fria Rivers flow into the Gila about fifteen miles east of Allenville.

TABLE 2

STORAGE CAPACITIES OF SALT RIVER PROJECT DAMS
ON THE SALT AND VERDE RIVERS

Dam	Reservoir Capacity (acre-feet)	Percent of Total	Year Completed
Salt River			
Roosevelt	1,381,580		1911
Horse Mesa	245,138		1927
Mormon Flat	57,852		1925
Stewart Mountain	69,765		1930
Granite Reef	Negligible		1908
Total: Salt System	1,754,335	85%	
Verde River			
Horseshoe	131,427		1946
Bartlett	178,186		1939
Total: Verde System	309,613	15%	
Total: Salt & Verde Systems	2,063,948	100%	

Inflow from the Gila and its tributaries above the confluences with the Salt and Agua Fria was negligible in the 1966 and 1978 floods, but such inflow could affect Allenville.

The immediate flood problem in Allenville results when floodwaters exceed the capacity of the Gila River's natural channel. This is complicated by the channel's minor meanderings caused by low flows and periodic flooding. Damage in Allenville can be expected when flows in the Gila River increase to 65,000 cubic feet per second (cfs). Under present conditions, the standard project flood (SPF) with a peak discharge of 360,000 cfs and the 100-year flood with a peak discharge of 215,000 cfs would inundate the entire community. Flooding along the Gila River through the study area has been recorded since the 1930s. The most serious of the early floods occurred in February 1891, with a peak flow along the Gila at Gillespie Dam of approximately 250,000 cfs.

Since 1891, flooding on the Gila River has occurred in 1905-1906, 1916, 1920, 1938, 1965-1966, 1973, 1978 and 1980. The first significant flood at Allenville occurred on New Year's Eve of 1965. Residents at the west end of town were evacuated for four to five days. On March 2, 1978, Allenville was flooded when the Gila River peaked at 95,000 cfs.

Figure 4. March 1978 floodwaters reached window level in some areas.

The results were devastating and residents once again were evacuated. Water marks and mudlines were left on the outside of homes six feet above ground level. The damage, estimated at $150,000, left the entire community uninhabitable. After recession of floodwaters, the residents began a cleanup campaign. In December 1978, however, Allenville was inundated by a flood that peaked at 120,000 cfs, causing $120,000 in damages. The community has been evacuated since that time. On February 15, 1980, as this report was being prepared, Allenville was again flooded by the largest spills from the upstream dams to date. Flows in excess of 150,000 cfs did little additional damage, however, as homes had for the most part not been repaired since the December 1978 flood. Plate 2 shows the floodway and 100-year floodplain.

Figure 5. Following the March 1978 flood, residents began clean up operations to move back into their homes, only to be forced out again by flooding that December.

Water Quality

Domestic water for Allenville is provided by wells. The quality of groundwater in the area, however, is poor. Levels of total dissolved solids (TDS) are greater than 7,000 mg/l, well above accepted standards for drinking water. Chloride, nitrate, sulfate, and fluoride levels also are high at Allenville. The Maricopa County Health Department (MCHD) has declared the Allenville water source to be substandard and condemned its use for drinking. At the same time, MCHD has allowed the well to remain in operation, provided that the residents drink only bottled water. In fact, however, most persons living in Allenville continued to consume water from the well. Any solution to the flooding problems at Allenville will take into consideration the need to improve water quality for the community.

Social Factors

A unique social feature of Allenville is the cohesion of the settlement. Socio-economic factors have combined to foster a strong feeling of community among the residents. Throughout the early planning of the flood control study, persons living in Allenville voiced a strong desire to remain together as a community no matter which flood control solution was selected. If no prompt action is taken to relieve the flooding problem, or if residents are relocated separately in other metropolitan Phoenix areas, the cohesion of the community could be disrupted and cultural patterns developed over years of economic and social discrimination destroyed. The need to preserve the community of Allenville as a unit must be recognized in continued flood control planning.

Recreation Needs

Residents of Allenville are proud of the fact that through the Community for Progress organization, they have been able to develop a County park and community center. These facilities, however, were inundated by the floods of March and December 1978 and February 1980, and will continue to suffer damages if no Federal flood control action is taken. The necessity of enhancing the recreational facilities in Allenville is addressed in this DPR.

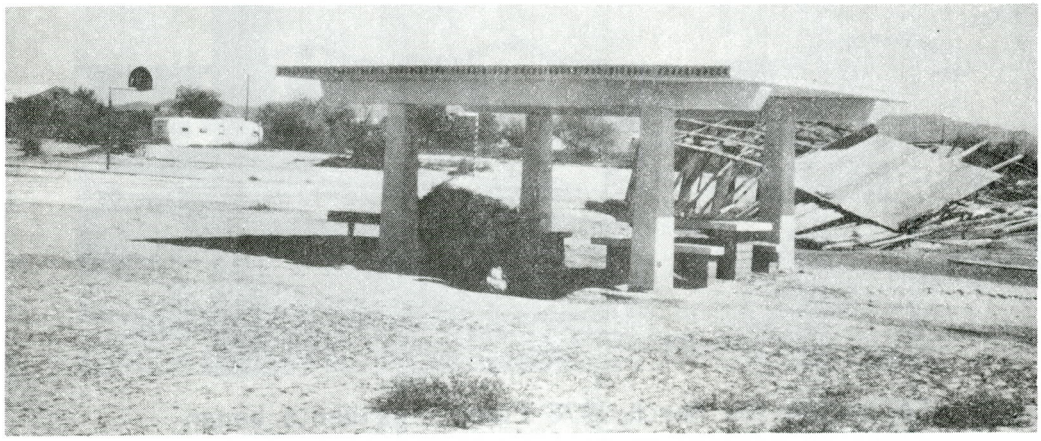
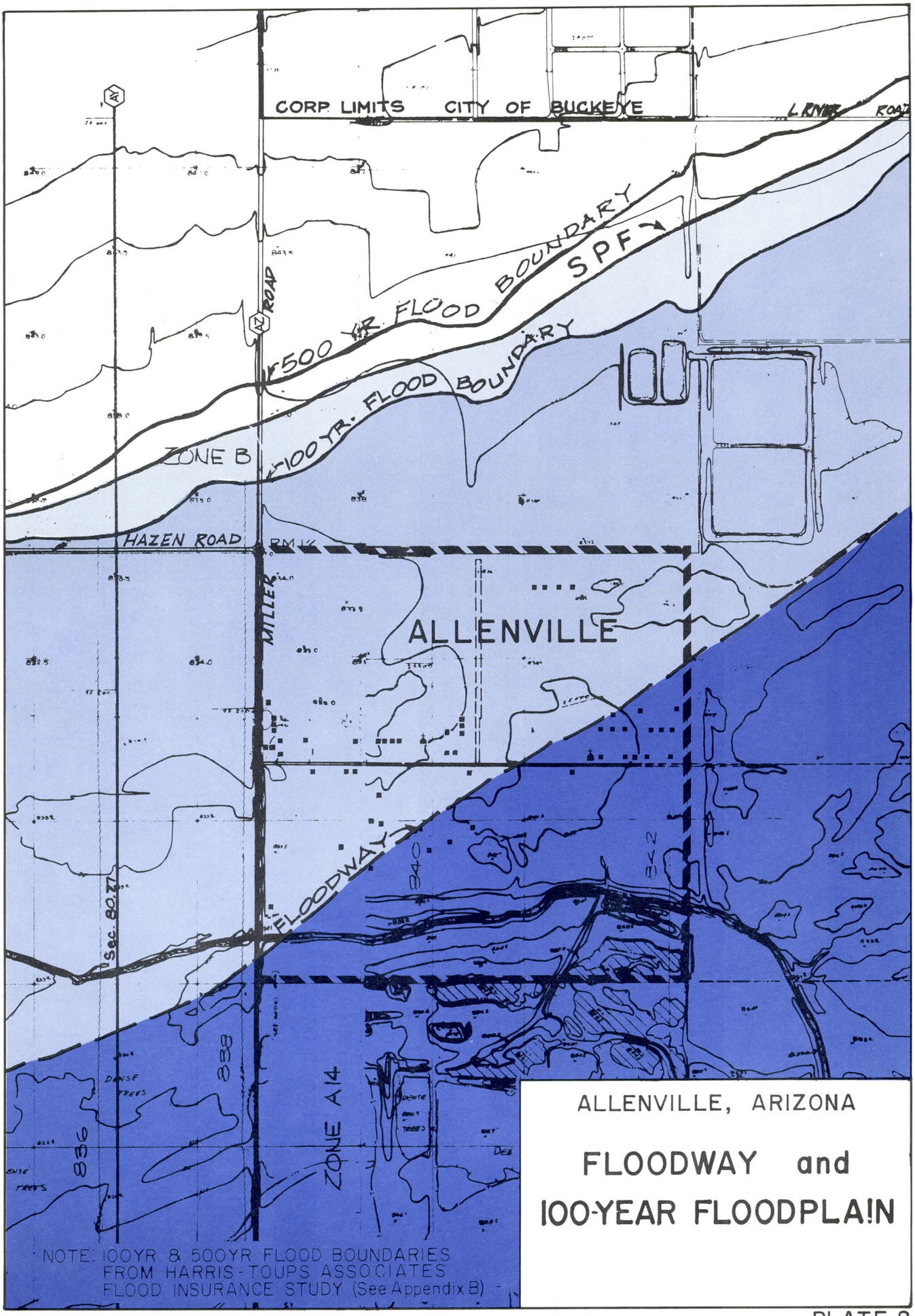


Figure 6. A vacant ramada is all that remains of the County Park.



ALLENVILLE, ARIZONA

FLOODWAY and 100-YEAR FLOODPLAIN

PLATE 2

Natural Resources

The floodway of the Gila River in the vicinity of Allenville contains dense thickets of phreatophytes, principally tamarisk. This growth provides habitat for a number of species of reptiles, small mammals, and birds. Flood control alternatives examined by this study will include plans for maintaining or improving the natural resources of the region.

Planning Constraints

Time is the principal planning constraint facing the Allenville flood damage reduction study. Most of the displaced persons have been living in mobile homes for the past 24 months and can expect at least 15 more months in temporary housing. Some families returned to their substandard and damaged homes after the 1978 floods, inviting danger from flooding and/or public health deficiencies. Any delays in solving flooding problems can only result in more families moving back into the floodplain, thereby aggravating an already dangerous situation.

A second planning constraint arises from the expressed desire of the inhabitants of Allenville to remain together as a community. Any plan which does not take into account these wishes would be unacceptable to the residents and could cause severe social dislocation.

Figure 7. Since December 1978, most Allenville residents have been living in trailers supplied originally by the Department of Housing and Urban Development, but now owned and administered by the State of Arizona.

Planning Objectives

In order to address the problems and needs of Allenville within the aforementioned constraints, planning objectives for the flood damage reduction study have been formulated. Principal planning objectives are: 1) to eliminate dangers to life and property through flooding by either structural or nonstructural measures; and 2) to keep the community of Allenville together as a social unit. Other objectives of the study include: 3) improvement of water quality for Allenville; 4) maximizing the recreational benefits to be derived from a project; 5) minimizing adverse impacts on cultrual resources; and 6) enhancing fish and wildlife in the area.

Evaluation Criteria

Corps of Engineers plan formulation compares alternative solutions against a "no-action" plan which projects conditions if no Federal action is taken. The recommended solution must be obtained through an analysis of plans which maximize National Economic Development (NED) and Environmental Quality (EQ). The NED plan increases the value of the nation's output of goods and services and improves national economic efficiency. This is realized by a maximum net economic return, the determination that a project accomplishes a stated purpose in a more economical manner than any other means of accomplishing that purpose, and realization that a definite need exists for the specific project or component. In order to be considered economically viable, an NED plan must have a benefit/cost ratio of at least 1.0. The benefit/cost ratio is a comparison of expected benefits to projected NED costs.

The EQ plan preserves, restores, or improves the environment. This is accomplished through management, protection, preservation, enhancement or creation of areas of natural beauty, enjoyment, or archaeological, historical, ecological, or geological importance.

FORMULATION OF ALTERNATIVE PLANS

The Corps of Engineers examined a number of alternatives to accomplish the stated objectives of the Allenville flood damage reduction study. These included structural measures, both upstream and in the vicinity of the community, and nonstructural solutions.

Structural Alternatives

Upstream Solutions

The Plan of Study for the Central Arizona Water Control Study (CAWCS) being conducted by the Water and Power Resources Service with the assistance of the Corps of Engineers, finalized in January 1980, considered the construction of new dams with flood control capacities and modification of existing structures to provide increased protection.

The best estimate at this time, however, is that the most ambitious of the proposed dams would still allow a release of 50,000 cfs downstream from the confluence of the Salt and Verde Rivers. This release, when

added to possible inflow from the Agua Fria River would result in flooding at Allenville, causing damages at least as severe as those experienced in the 1965 flood. In addition, selection of the preferred alternative, which may not include any of the above-mentioned structures, is not expected until 1982, and completion of the recommended project may not occur for several years thereafter. For these reasons, consideration of upstream solutions for Allenville flood control was discontinued.

Channelization

The Central Arizona Water Control Study also examined channelization of the Salt and Gila Rivers for flood control. Several channel configurations were analyzed including rectangular concrete, trapezoidal concrete, and soft-bottom with revetted sideslopes. Of the three, the soft-bottom type appeared to be the most cost-effective for flood control. An economic analysis completed as part of the Plan of Study for the CAWCS of a projected soft-bottom channel extending from the Salt-Gila confluence to Gillespie Dam, which would provide some protection for Allenville, produced an estimated benefit/cost ratio of 0.11. This was based on first costs of $76,000,000, annual costs of $5,700,000, and annual benefits of $680,000. Channelization, therefore, has been eliminated from further study.

Channel Clearing

The alternative of clearing a channel through the dense growths of tamarisk which currently choke the Gila River near Allenville also was examined. Ordinarily, vegetation growing in the floodway will slow the flow of water, causing it to spread out over a wider area and inundate a larger portion of the floodplain. By clearing a section of the channel, the river will flow more swiftly, decreasing, somewhat, the width of the floodway and the area flooded.

A number of methods, including chaining, burning, and use of herbicides, could be used to accomplish clearing in the river bed. Channel clearing, however, has met with strong opposition from environmental groups, and it is unlikely that this conflict will be resolved in the near future. Although this flood control measure is being investigated by the CAWCS, it has been determined that channel clearing alone would not significantly reduce the flooding at Allenville. The Flood Control District of Maricopa County currently is conducting a study of the feasibility of clearing a 1,000-foot wide channel in the Gila River in the vicinity of Allenville, although there is no established schedule for completion.

A hydraulic analysis of a cleared channel 1,500 feet wide and 10 miles long prepared for the Allenville study indicated that the water level for a 100-year flood would be lowered approximately two feet at the south edge of Allenville. The estimated cost of this alternative is $11,076,000, with an average annual maintenance cost of $1,000,000, and total annual costs of $1,790,000. Since this alternative did not provide sufficient protection and the annual benefits are only $32,600, the examination of channel clearing was not pursued.

Initially channel clearing also was examined in combination with levee construction and flood proofing. Since channel clearing costs could not be justified by a wide margin, these combinations have not been included in the economic analysis of the alternatives. The projected effect of channel clearing on the levee and flood proofing plans, however, is illustrated in Plate 3.

Levees

The possibility of constructing a levee along the north bank of the Gila River from its confluence with the Salt to Gillespie Dam is being investigated by the CAWCS. Since this levee would pass to the north of Allenville, requiring the evacuation of the community, a levee to provide local protection for Allenville was analyzed as a part of this study. The levee would be approximately two miles long and have an average height of 9.25 feet. (See Plate 4.) This alternative would provide benefits for damages prevented to the Buckeye sewage treatment facility as well as to Allenville itself. Initial costs for the levee are estimated at $1,269,000 while annual costs for operation and maintenance are estimated at $9,000. Annualized at 7-1/8 percent, these costs come to $99,500. The annual benefits would be $88,000, giving a benefit/cost ratio of 0.88. This alternative, therefore, could not be economically justified. See Hydraulic Design, paragraph 8, of Appendix B for additional information.

Summarizing structural solutions, upstream flood control is not expected to be provided in the near future and, even if provided, would not offer adequate protection for Allenville. Neither channelization nor a levee are economically justified. Channel clearing under either the authorized project or the program being considered by local interests would not provide adequate protection for Allenville. Table 3 outlines the economic evaluation of the structural alternatives. See Appendix D for additional details.

TABLE 3

ECONOMIC COMPARISON OF STRUCTURAL ALTERNATIVES*
(Values in Thousands of Dollars)

Alternative	Initial Cost	Operation and Maint. Costs	Annual Costs	Annual Benefits	Benefit/Cost Ratio
Channelization Gila Confluence to Gillespie Dam**	76,000	100	5,700	680.0	0.11
Channel Clearing	11,076	1,000	1,790	32.6	0.02
Levee	1,269	9	99.5	88.0	0.88

*Based on January 1980 price levels and 100-year period of analysis at 7-1/8 percent interest rate

**Economic Analysis taken from CAWCS Plan of Study.

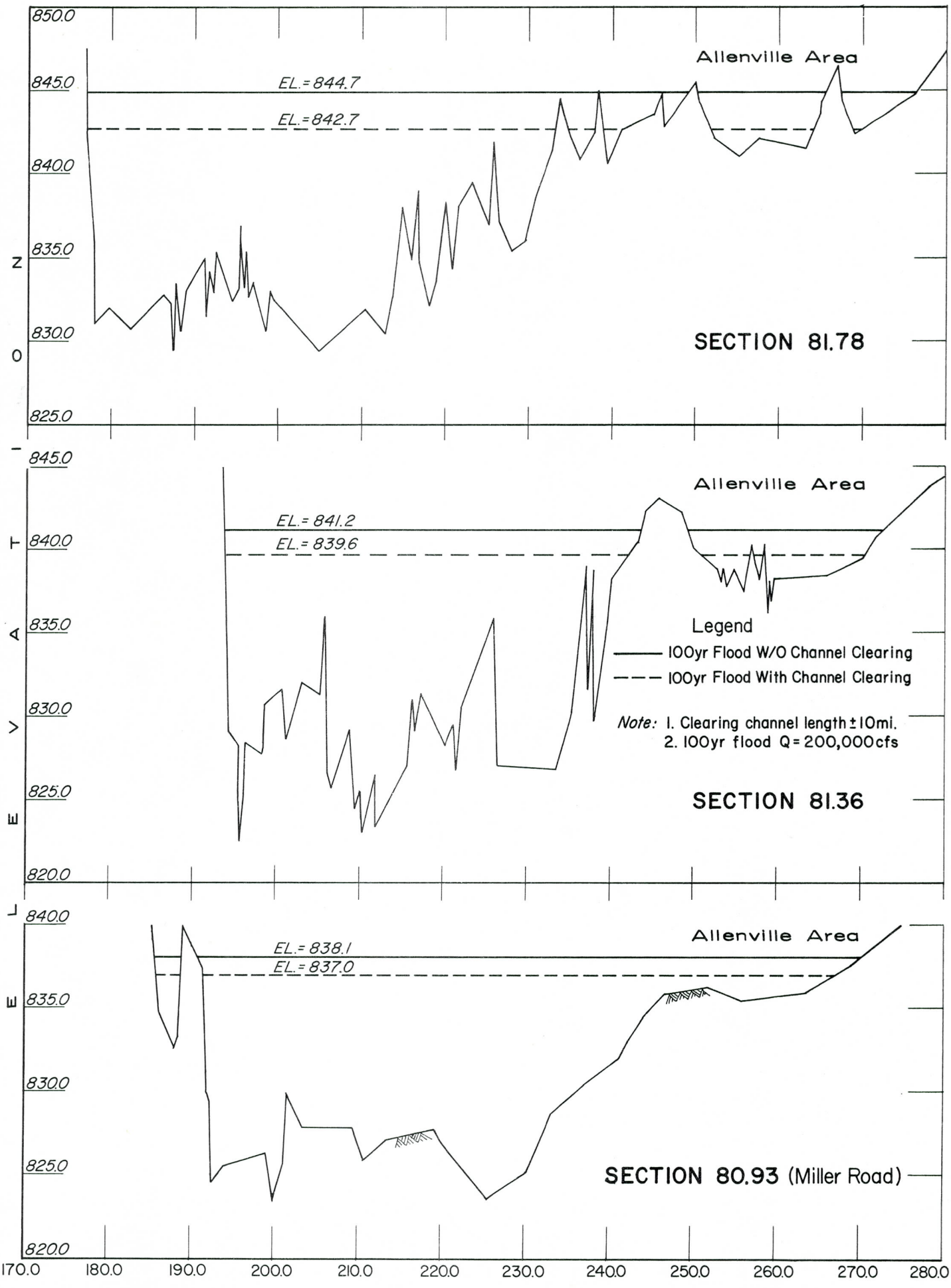
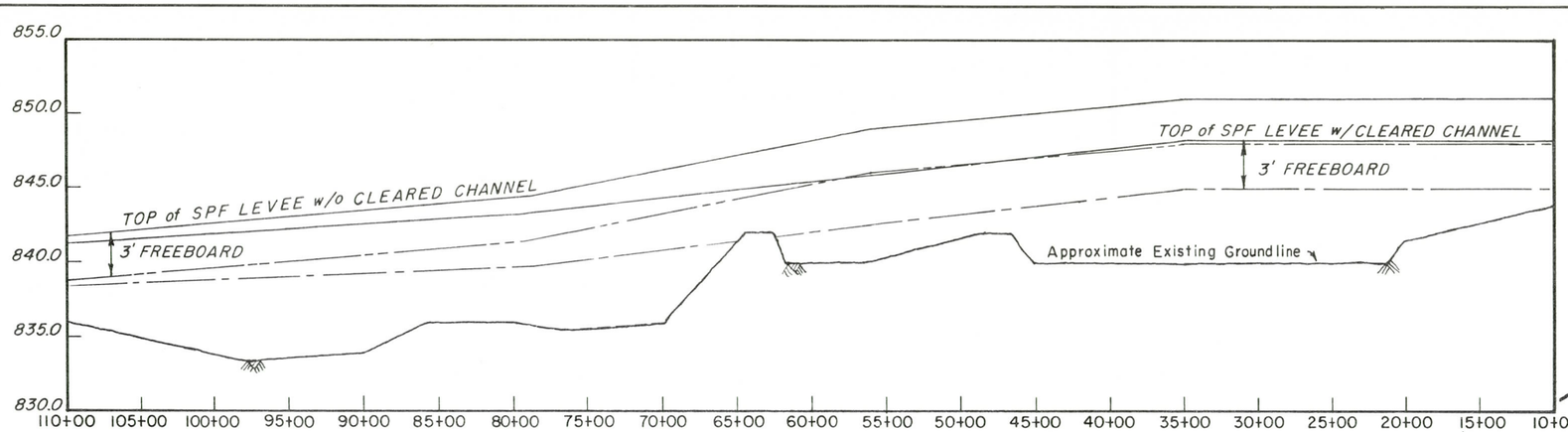
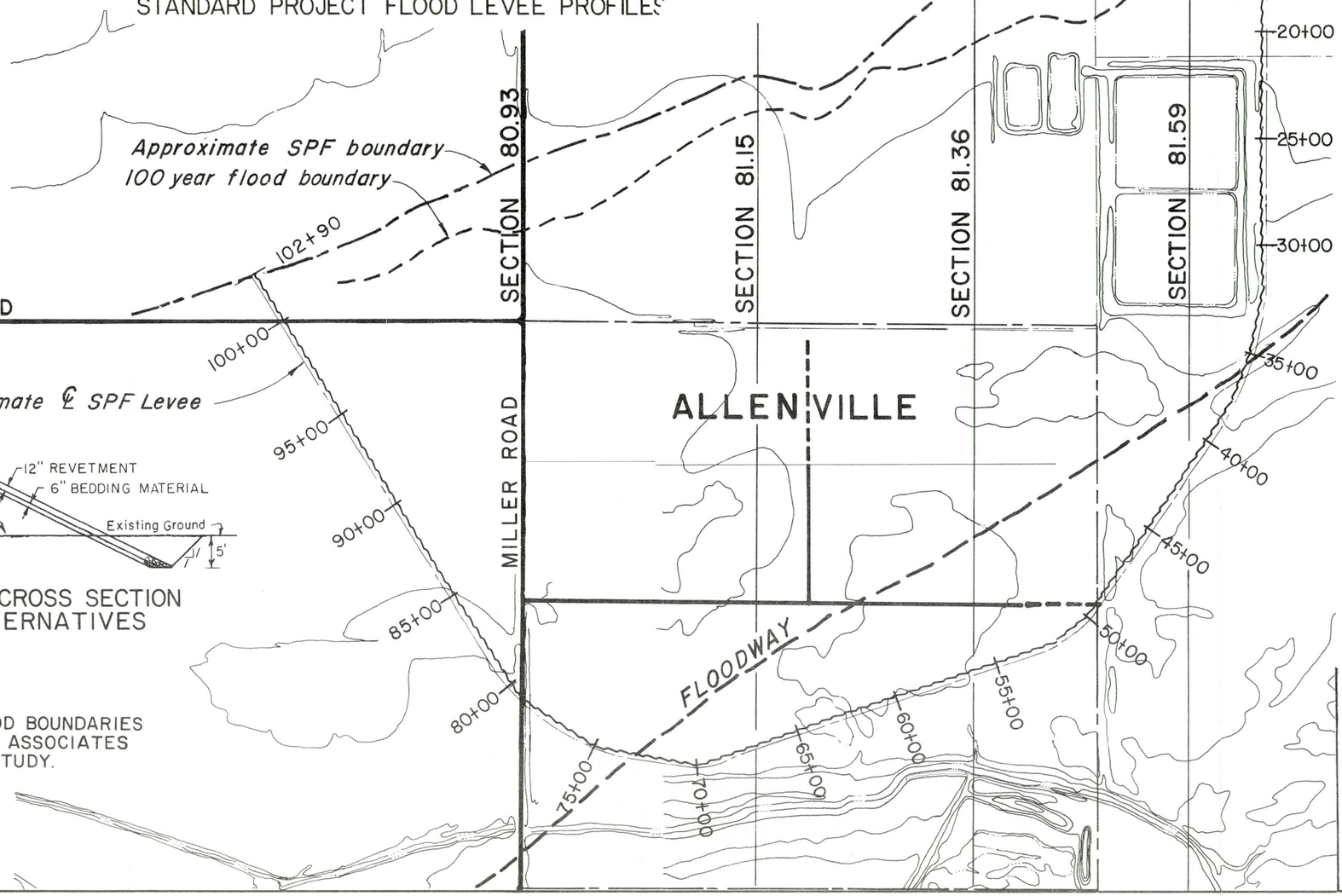
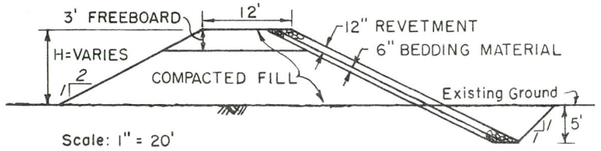

850.0
845.0
840.0
835.0
830.0
825.0
ELEVATION
Allenville Area
EL.= 844.7
EL.= 842.7
SECTION 81.78
845.0
840.0
835.0
830.0
825.0
820.0
ELEVATION
Allenville Area
EL.= 841.2
EL.= 839.6
Legend
100yr Flood W/O Channel Clearing
100yr Flood With Channel Clearing
Note: 1. Clearing channel length ± 10mi.
2. 100yr flood Q = 200,000cfs
SECTION 81.36
840.0
835.0
830.0
825.0
820.0
ELEVATION
Allenville Area
EL.= 838.1
EL.= 837.0
SECTION 80.93 (Miller Road)
170.0
180.0
190.0
200.0
210.0
220.0
230.0
240.0
250.0
260.0
270.0
280.0

PLATE 3



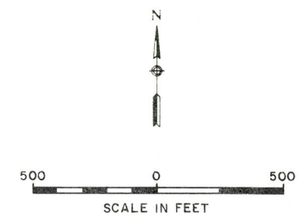
STANDARD PROJECT FLOOD LEVEE PROFILES





TYPICAL LEVEE CROSS SECTION
FOR ALL ALTERNATIVES

NOTE: 100YR & 500YR FLOOD BOUNDARIES FROM HARRIS-TOUPS ASSOCIATES FLOOD INSURANCE STUDY. (See Appendix B)



ALLENVILLE, ARIZONA

LEVEE ALTERNATIVE

U. S. ARMY ENGINEER DISTRICT
LOS ANGELES
CORPS OF ENGINEERS

PLATE 4

Nonstructural Alternatives

In conformance with Section 73a of the 1974 Water Resources Act, the Allenville study investigated the feasibility of nonstructural solutions to the flooding problem. These solutions were: 1) flood proofing, and 2) permanent evacuation of the residents out of the floodplain.

Flood Proofing

The alternative of flood proofing involved raising a sizable portion of Allenville above the level of the 100-year flood. (See Plate 5.)

This alternative would require raising of land in the fringe of the Gila River floodway, and reconstruction on the raised land of those structures presently in the floodplain. The construction and condition of the building still standing in Allenville are such that none could be raised or moved. Streets and utilities also would have to be improved to meet County standards. In addition, it was determined that a small levee system would be necessary to ensure that Allenville would not be isolated during a major flood.

The option of flood proofing in combination with channel clearing also was examined. This study indicated that, when combined with a cleared 1,500-foot-wide channel in the Gila River, the height to which the community would have to be raised was decreased by only one foot.

The economic evaluation of flood proofing without channel clearing produced annualized costs of $198,600 based upon an initial cost of $2,750,000 and annual O&M costs of $2,500. Annual benefits were $92,200 producing a benefit/cost ratio of .5. This lack of economic justification cause the flood proofing alternative to be dropped from further study.

Floodplain Evacuation

The nonstructural solution of permanent evacuation or relocation of the residents of Allenville out of the floodplain appeared to be the only economically justified method of providing flood damage reduction for Allenville.

Initially, three alternatives for relocation were developed:

- physically moving the structures in Allenville to a different site outside the floodplain;
- razing existing structures in Allenville and individually relocating residents to dwellings in the Buckeye Valley or metropolitan Phoenix;
- razing existing structures in Allenville and constructing a replacement community for the residents outside the floodplain.

The first of these, relocating existing substandard structures in Allenville out of the floodplain, was rejected because the Corps cannot participate in a project which does not provide for safe, decent, and sanitary housing for the residents. Since many of the buildings in Allenville did not meet these standards even before the 1978 floods, relocating them and allowing them to be reoccupied would be counter to Corps policy. In addition, it was determined that most buildings in the community were so dilapidated as to make moving them impossible.

The two remaining relocation alternatives both were feasible from an engineering standpoint and produced positive NED benefits. Detailed descriptions and evaluations of these plans are presented in the following section.

DETAILED PLANS

Individual Relocation

The individual relocation alternative requires the permanent abandonment of the present site of Allenville. Residents of the community would receive relocation benefits under provisions of PL 91-646. These benefits would be administered by the State of Arizona. The 51 families would then be resettled to houses or rental units in the Buckeye Valley, communities west of Phoenix, or in the city of Phoenix itself. Structures remaining in Allenville would be razed, and the cleared parcels converted to uses compatible with Federal floodplain management goals.

Community Relocation

The community relocation alternative also requires the abandonment of the present Allenville site. Under this plan, however, a replacement community would be constructed for the residents outside of the floodplain. The relocation site would be on a 60-acre tract near the intersection of I-10 and Palo Verde Road, approximately eight miles northwest of Buckeye (see Plate 6). The Corps would construct the streets and utilities, community center, park, and replacement houses at the new site, with work beginning in September 1980 and completion of the project in June 1981, subject to authorization and funding. This community relocation plan provides for the continuation of the Allenville community but does not restrict any of the former residents from relocating elsewhere.

Plan Evaluation

The individual relocation alternative is the NED plan, producing the greatest net benefits. Estimated NED costs for this plan are:

Structure Acquisition	Razing Allenville	Land Acquisition	Total
$650,000	$110,000	$32,000	$792,000

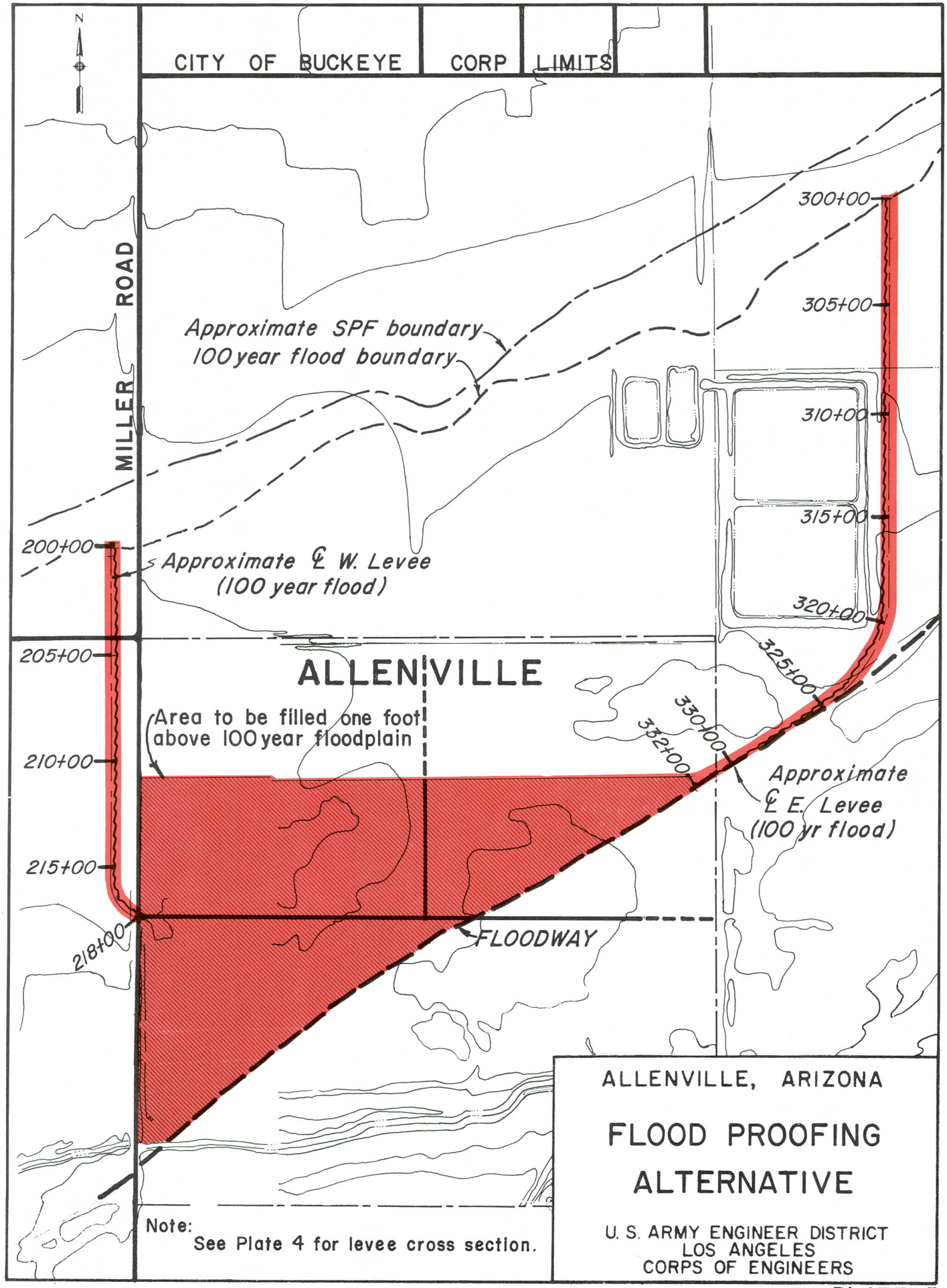
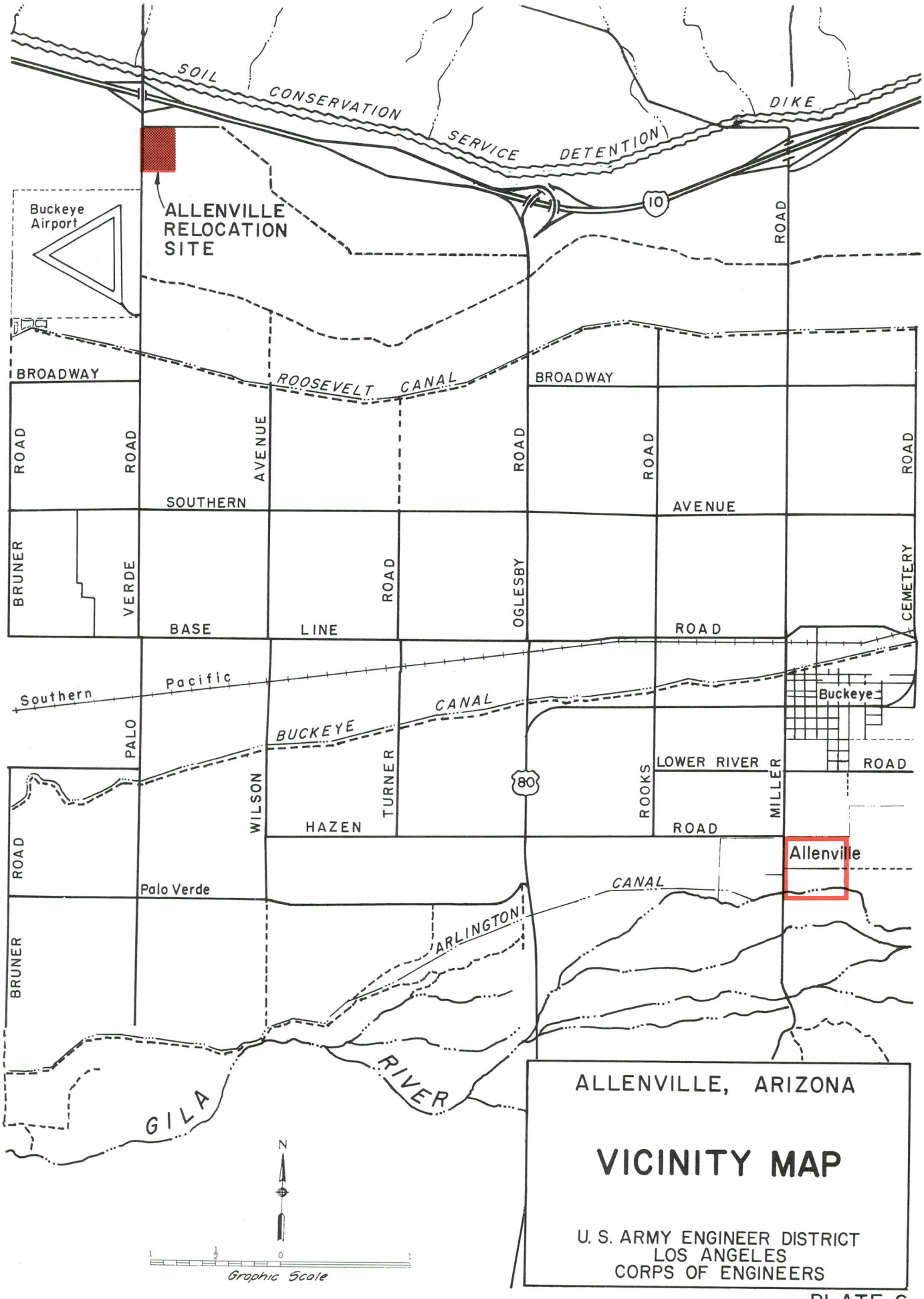

CITY OF BUCKEYE
CORP LIMITS
MILLER ROAD
Approximate SPF boundary
100 year flood boundary
300+00
305+00
310+00
315+00
320+00
325+00
330+00
332+00
200+00
Approximate ℄ W. Levee
(100 year flood)
205+00
ALLENVILLE
Area to be filled one foot
above 100 year floodplain
210+00
215+00
218+00
FLOODWAY
Approximate
℄ E. Levee
(100 yr flood)
Note:
See Plate 4 for levee cross section.
ALLENVILLE, ARIZONA
FLOOD PROOFING
ALTERNATIVE
U. S. ARMY ENGINEER DISTRICT
LOS ANGELES
CORPS OF ENGINEERS

PLATE 5



ALLENVILLE, ARIZONA

VICINITY MAP

U. S. ARMY ENGINEER DISTRICT
LOS ANGELES
CORPS OF ENGINEERS

PLATE 6

Average annual costs for the individual relocation alternative, annualized at 7-1/8 percent over 100 years would be $56,000. Average annual benefits, based on emergency costs prevented, damages prevented to public utilities, as well as a portion of the damages prevented to homes and other structures come to $88,000, producing a benefit/cost ratio of 1.6 (see Appendix D). The individual relocation plan had no significant adverse environmental effects. Allowing the existing site to revert to natural conditions, under the management of Arizona Department of Game and Fish, will enhance wildlife resources in the area. This alternative has been designated the EQ plan.

Although this alternative produces a favorable benefit/cost ratio, individual relocation would result in unacceptable socio-economic effects. A survey of housing in Buckeye and the area to the west of Phoenix indicated a lack of available safe, decent, and sanitary homes or rental units which the people of Allenville could afford. This would require most residents to relocate in Phoenix, where affordable housing also would be difficult to find. Many relocatees, therefore, could be forced into substandard housing or into a higher level of indebtedness.

In addition to the financial difficulties which individual relocation would produce, the alternative also results in severe social consequences. The factors of Allenville's founding and development have led to the creation of a very close-knit community. People have to depend upon one another, particularly in times of distress. The presence of a large number of elderly residents in the community has increased this interdependence. They rely on their neighbors for transportation and other forms of assistance. The individual relocation alternative would destroy this community cohesion. Scattering the residents throughout the Buckeye and Phoenix areas would result in a serious social trauma, particularly to Allenville's elderly. It is also highly unlikely that the churches and Masonic Lodge, institutions vital to the cohesion of the community, could survive under the individual relocation alternative.

It was determined that, despite the favorable benefit/cost ratio, the individual relocation alternative would result in unacceptable economic and social impacts to the community of Allenville. For this reason, further study of the plan was discontinued.

The community relocation alternative also produces positive net economic benefits. Estimated NED costs for this plan are:

Structure Acquisition at Allenville	Razing Allenville	Land Acquisition	Site Dev. and Utilities*	Engr. & Design and Suprv. & Admin.	Total
$650,000	$110,000	$32,000	$98,000	$10,000	$900,000

*This figure represents the cost of replacing the streets and utilities as they exist in Allenville. The difference between this amount and the cost of constructing new facilities to safe, decent, and sanitary standards mandated by HUD at the relocation site is a betterment, and is not an NED cost. The $98,000 includes $89,000 for construction and $9,000 for contingencies.

These costs are based upon all families relocating; forty families as a community and eleven individually. Average annual costs for the community relocation alternative, annualized at a rate of 7-1/8 percent over 100 years would be $64,200. Average annual benefits, based on emergency costs prevented, damages prevented to public utilities, as well as a portion of the damages prevented to homes and the structures, come to $88,000, producing a benefit/cost ratio of 1.4 (see Appendix D).

The community relocation alternative provides affordable safe, decent, and sanitary housing for the people of Allenville at the new site. The goal of the plan is to relocate the residents to the new site and leave them in a financial situation as close as possible to their pre-flood status. To accomplish this, the State of Arizona would, in some cases, supplement the relocation benefits of those residents who elect to move to the new site. This would enable them to purchase the housing constructed by the Corps without incurring a large debt. The Corps, however, would not share in the cost of these supplemental payments. In addition to providing affordable housing for the residents of Allenville, the community relocation alternative has the advantage of encouraging social cohesion by keeping the community together. Unlike the individual relocation alternative, this plan includes construction of a replacement community center and provides sites for the churches and lodge hall. The community relocation plan has no significant adverse environmental effects. Allowing the existing site to revert to natural conditions, under the management of Arizona Department of Game and Fish, will enhance wildlife resources in the area.

Although its benefit/cost ratio is somewhat lower than that of individual relocation, the community relocation alternative is the only plan for reducing flood damages at Allenville which is economically justified as well as socially acceptable. It provides safe, decent, and sanitary housing which both homeowners and renters in Allenville can afford. It also promotes community cohesion. For these reasons, community relocation was chosen as the selected plan.

TABLE 4

SUMMARY COMPARISON OF ALTERNATIVE PLANS

		Individual Relocation	Community Relocation
A.	Significant Impacts		
1.	Homes Taken	51	none
2.	Business Taken	1	1
3.	Community Cohesion	Destroys social cohesion of the community	Encourages community cohesion
4.	Esthetic Values	none	none
5.	Transportation	Possible long distances to and from work	No significant impact
6.	Leisure Opportunities	none	none
7.	Community Growth	Destroys community of Allenville	Promotes growth by removing community from floodplain where it was subject to County zoning restrictions
8.	Local Activity and Land Use: beneficial	none	Changes relocation site from vacant to residential
	adverse	none	Possible loss of some adjacent cropland due to pesticide restrictions
9.	Public Facilities	Destroys community center and County Park	none
10.	Employment: beneficial	none	none
	adverse	none	none
11.	Displacement of Farms	none	Possible loss of some adjacent farmland due to pesticide restrictions

TABLE 4 (cont.)

	Individual Relocation	Community Relocation
12. Property Values: beneficial	none	Increases value of relocation site
adverse	Loss in assessed value of old site due to relocation	
13. Noise	Short-term effects during razing of old site	
		Possible long-term impacts from Buckeye Municipal Airport
		Short-term effects during construction at new site
		Slight increase in ambient levels due to proximity of Buckeye Airport
14. Air Quality	Short-term effects during razing of old site	
		Short-term effects during construction at new site
15. Biology	Creates riparian habitat	Creates riparian habitat - disturbs upland habitat
16. Endangered Species	no effect	no effect
17. Prime Farmland	no effect	no effect
18. Cultural Resources	no effect	no effect
19. Water Quality surface/ground	no effect	no effect
B. Plan Evaluation		
1. Contributions to Planning Objectives:		
flood control	Protection from SPF by removal of community from floodplain	
recreation	Destroys County Park	Maintains County Park

TABLE 4 (cont.)

	Individual Relocation	Community Relocation
environmental quality	Create new areas of wildlife habitat in the floodplain by razing old site	
water quality	Improve water quality for residents	
2. Relationship to National Accounts		
a) NED		
beneficial flood control	+$88,000	+$88,000
adverse flood control	-$56,500	-$64,200
Net NED Benefits (equivalent annual 7-1/8% - 100 yrs.)	+$31,500	+$23,800
b) Environmental Quality		
threatens endangered species	no	no
negative esthetic appeal	no	no
destroys cultural resources	no	no
disturbs upland habitat	no	yes
destroys riparian habitat	no	no
creates riparian habitat	yes	yes
3. Relationship to Other Accounts.		
a) Regional Development:		
beneficial	Same as NED accounts	
adverse	Minimal	
b) Social Well-being:		
beneficial	Reduce threat to life and property due to floods	Maintains community cohesion
adverse	Destroys social fabric of the community	none

DESCRIPTION OF THE SELECTED PLAN

Under the community relocation alternative, the local sponsor (Arizona State Division of Emergency Services) will acquire all the necessary real estate.

Arizona state participation in floodplain relocation is governed in part by the Arizona Flood Plain Land Exchange Law, a part of the State Omnibus Flood Control Act of 1979. As provided for by the Act, the Division of Emergency Services presented alternative relocation sites to the residents of Allenville for selection. Five suitably-sized parcels of State trust land located out of the Gila River Floodplain but within the general vicinity of Allenville were considered (see Plate 7). The farthest site was fourteen miles from Allenville, and the closest one (the Palo Verde Road site) was approximately nine miles distance. The selection was made by the Board of Directors of Allenville for Community Progress, Inc., at the request of the residents. Of the alternate sites considered, the site designated 1 on plate 7 was unsuitable because of its proximity to the Palo Verde Nuclear Generating Station (approximately five miles) and the fact that the Hassayampa River floodplain passes through part of the section. Alternatives 2 and 3 were sited on relatively rugged terrain with gullies and washes cutting through the area. Both sections of land are subject to shallow flooding by sheetflow resulting from local storms and runoff from the White Tank Mountains. Site 3 was particularly objectionable due to its reputation as an area of violence. Site 4 and the selected site at Palo Verde Road were considered as the best choices

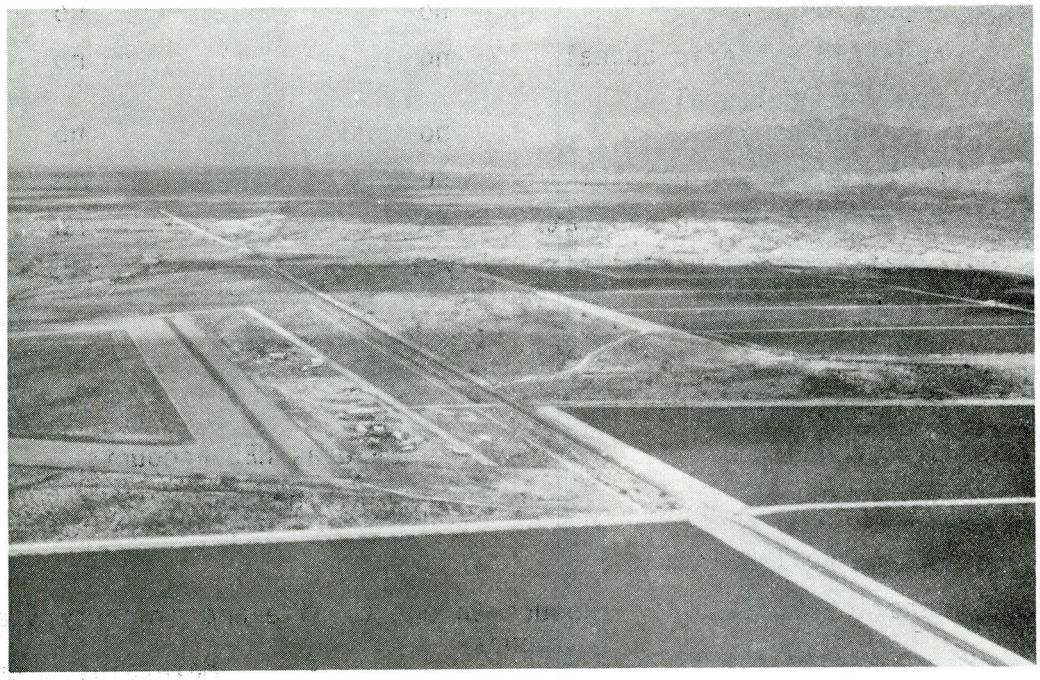
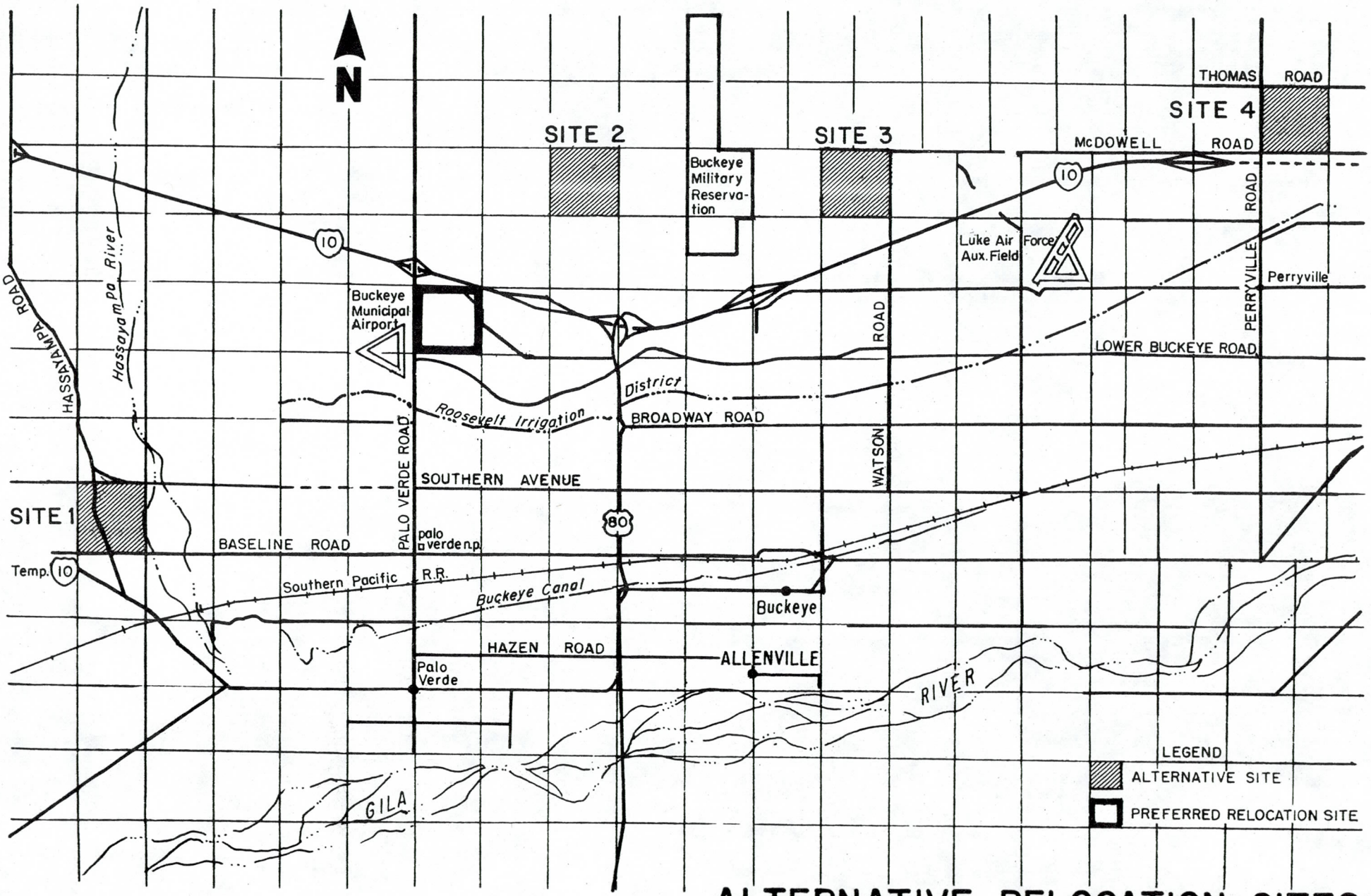


Figure 8. The Palo Verde Road relocation site for Allenville appears in the center of this photograph. To the left is the Buckeye Municipal Airport.



ALTERNATIVE RELOCATION SITES

PLATE 7

based upon proximity to transportation, attractiveness and relatively flat terrain. Both parcels were also being considered at that time as future prison sites by the State. Knowing the political upheaval the prison site selection was causing within the state, the Board of Directors of the Allenville for Community Progress, Inc. elected to choose the site not selected by the prison, primarily to avoid conflicts and controversy. This site has the additional advantage of being protected from significant sheetflow by a Soil Conservation Service Detention Dike directly north of the site and is the closest site to Buckeye and Allenville. Many of the residents are familiar with the area having worked the nearby fields and having lived in the area in labor camps in the 1930s and 1940s.

Subsequent to the selection, the State Flood Recovery Act was amended, allowing for the consideration of non-trust lands as relocation sites. The Board was notified of the potential for changing the relocation site, but reconfirmed the choice of the Palo Verde site, by letter, in January 1980. By this time, considerable engineering and environmental work had been performed at the site. Since the site was acceptable from engineering and environmental considerations, and was the choice of the residents, it was accepted by the State and the Corps as the relocation site.

The State of Arizona will administer the relocation assistance program in accordance with PL 91-646. Proposed Corps Regulation 1165-2-122, however, specifies, "... the non-Federal share of costs for recommended nonstructural measures will in all cases be 20 percent of the first cost of such measures, thereby assuring comparability to the average value of lands, easements and rights-of-way required for Corps structural projects." A waiver of the requirement that the Corps acquire all necessary interest in real estate (paragraph 9A of this regulation) is required to allow lands, easements, and rights-of-way to be acquired by the local sponsor as required by Section 205 of the Flood Control Act of 1948, as amended. Such a waver, nevertheless, will transfer only the responsibility for such transactions. The costs of these items will be cost-shared in accordance with the arrangement described in COST SHARING.

The Division of Emergency Services will perform all necessary coordination with the residents of Allenville, specifying the types and quantities of homes to be built. The new structures will meet HUD standards for safety, decency, and sanitation.

The Division of Emergency Services has contracted an architect-engineer firm which has completed preliminary designs and cost estimates (see Appendix C). The new community will consist of 20 single-family dwellings on lots of either one acre or approximately one-third acre. Current designs include facilities for 20 mobile homes (two renters have indicated they wish to purchase houses). The mobile homes are intended to serve as a means to allow renters from Allenville to remain with the community. The Division of Emergency Services intends to make the HUD obtained temporary housing units available on a sliding price scale (at a very nominal amount) to these displacees. Eleven families have elected to move to locations other than with the community. These households will still receive all entitlements of Public Law 91-646.

Another possibility explored was the construction of an apartment complex for some, or all, of the twenty families who could not afford single-family housing. The apartments, constructed by a local developer in the northern portion of the relocation site, would have been financed through a loan from FmHA, with rents subsidized through an arrangement with HUD. The apartments would have been included as a local cost. The concept of apartments as an alternative to mobile homes was explored through a local ad hoc committee representing agencies of the Western Federal Regional Council. Results of this committee's coordination with appropriate State and County agencies were presented to the residents of Allenville, who unanimously preferred the mobile home alternative. Consideration of the apartment concept has been discontinued because it was considerably more expensive than the mobile home option and was not desired by the community.

Also included in the plan are a County park and a community center. Designs of these facilities were based on replacement of features which had existed in Allenville.

Locations for two churches, a Masonic Lodge hall, and a commercial concern are included in the community relocation alternative, but these features would not be built by the Corps. First costs do include the acquisition of these structures and applicable relocation benefits in accordance with PL 91-646.

When construction is complete, the subdivision, consisting of twelve one-acre and twenty-three one-third-acre residential lots, as well as twenty mobile home lots (see Plate 8), will be turned over to the State. The State will either sell or rent at fair market value the homes and mobile homes. It is intended to construct only those facilities necessary to house the Allenville displacees desiring to relocate as a community. At a public workshop held in Allenville on January 31, 1980, a lottery was held to match households with subdivided lots in the new community. Plate 9 shows the results of this lottery and Table 5 lists the families who have signed letters of intent to purchase homes on those lots at the corresponding estimated costs. Should any vacant lots or houses not occupied by former Allenville residents remain, a clause in the Section 221 Agreement requires the State to sell this real estate on the open market.

Future use of the land at the present site of Allenville is dependent on the means whereby the State obtains the property at the relocation site. The Arizona Legislature enacted an amendment to the Omnibus Flood Recovery Act of 1979 in April 1980. The Omnibus Act had appropriate funds to reimburse the State Schools of lands held in trust by the State Land Department. The amendment extends the authority of the Division of Emergency Services to use these funds to purchase land from the trust for exchange with residents of floodplain areas. This would be done in lieu of reimbursing the trust for the loss in value of exchanging land out of the floodplain for floodprone parcels. The amendment is a direct result of the Allenville project, since the State could not provide the lands without encumbrance as long as the lands were held in trust for the schools.

MOBILE HOME LOT

1/3 ACRE RESIDENTIAL LOT

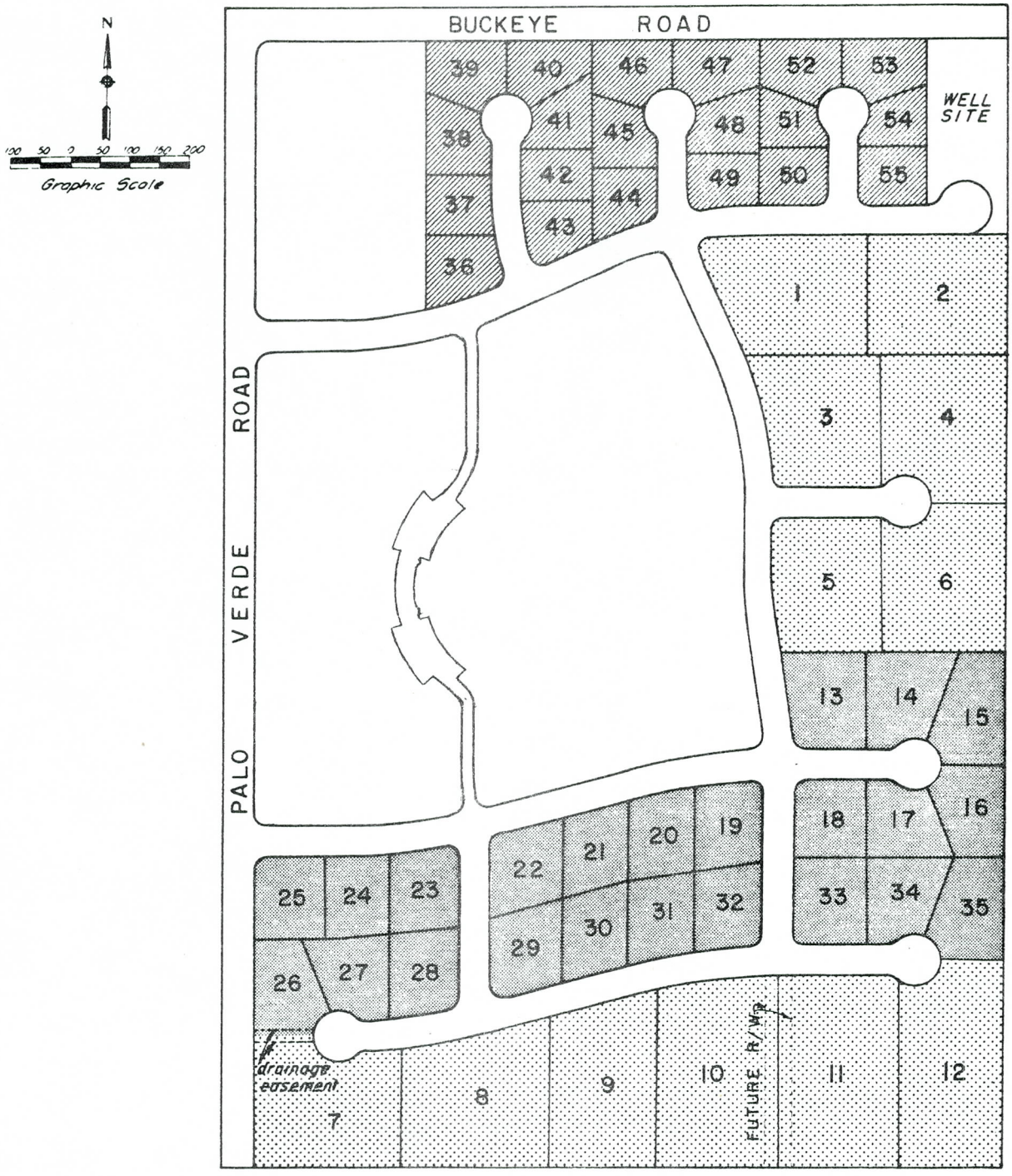
1 ACRE RESIDENTIAL LOT

ALLENVILLE, ARIZONA

PROPOSED RELOCATION SITE

U. S. ARMY ENGINEER DISTRICT
LOS ANGELES
CORPS OF ENGINEERS

PLATE 8



MOBILE HOME LOT

1/3 ACRE RESIDENTIAL LOT

1 ACRE RESIDENTIAL LOT

ALLENVILLE, ARIZONA

LOT DESIGNATIONS

U. S. ARMY ENGINEER DISTRICT
LOS ANGELES
CORPS OF ENGINEERS

PLATE 9

TABLE 5

OWNER RESIDENTS MOVING TO NEW ALLENVILLE

NAME	HOUSE SIZE* (No. of Bedrooms)	LOT NO.	NAME	HOUSE SIZE* (No. of Bedrooms)	LOT NO.
Bolden, Willie	2	29	Lofton, George	3	23
Brown, James	4	17, 18	Maynard, Margarette	3	13, 14, 15
Cobbin, Clyde	4	3	McGinty, Emily	4	10
Cooper, Willie	3	26	McGowan, Julia	2	12
Gonzales, Cruz	4	8	McCrae, John	2	6
Harris, Abe	4	11	Robinson, James	1	7
Harris, Willis	2	27	Wilburn, Arthur Sr.	1	5
Herring, Earline	3	24	Wilson, Ernestine	3	1
Jackson, Frank	2	34, 35	Woods, Willie	1	4
Land, Richard	4	16			

Mr. C. C. Franklin, a resident of Allenville whose home was washed away completely in the 1978 floods, intends to construct a new home on lots 19 & 20.

*Estimated house prices: 1 Bedroom - $34,600 | 3 Bedroom - 45,900
2 Bedroom - 38,400 | 4 Bedroom - 54,500

RENTERS MOVING TO NEW ALLENVILLE

NAME	LOT NO. (Mobile Home)	NAME	LOT NO. (Mobile Home)
Blackshire, V. L.	37	Larry, Frank	46
Brown, Gerald	53	Lee, George	51
Brown, Roy	52	Lee, Richmond	38
Calvert, Matthew	50	Lee, Ronnie	54
Chambers, Thurman	41	Nixon, Jimmie	43
George, Frank	55	Wilburn, Ralph	44
Grayson, Melvin	45	Wildfire, Betty	47
Herring, Freeman	42	Williams, Albert	49
Jenkins, Levell	36	Williams, Floyd	48
Land, Emery	40	Wilson, Willie	39

With the enactment of this law, the Division of Emergency Services will purchase the 60-acre tract identified for relocation of Allenville. The Corps of Engineers will construct the homes, park, community center, and support facilities. The division of Emergency Services will sell the homes at their fair market value and exchange the lands with their owners. Renters in Allenville will buy floodplain land from non-resident owners, thereby enabling them to exchange land through the State's program. Mobile home sites will be exchanged for renters' newly-acquired land, and the mobile homes will be sold to these families.

The churches, lodge, and tavern will have their lands exchanged and will receive their relocation benefits as prescribed by PL 91-646. The Allenville Community for Progress, Inc. will exchange land and receive title to the community center and well site in return for any consideration for their property in Allenville. It also will be responsible for the operation and maintenance of these facilities in the new community as it had been in Allenville. Maricopa County will exchange its park in Allenville for a comparable parcel at the relocation site.

After all improved parcels have been exchanged and all structures acquired in Allenville, the site will be razed and the land conveyed to the State Game and Fish Department. Although the land will not be contiguous, because the Division of Emergency Services does not intend to exchange unimproved land, the State Game and Fish Department has expressed an interest in managing these parcels. (See Appendix A). Unimproved land in Allenville will remain in private ownership, although County zoning and floodplain ordinances enacted in 1974 will restrict severely any type of construction in the 100-year floodplain. These ordinances will be relied upon to prohibit floodplain use not in accordance with floodplain management goals as outlined in ER 1165-2-26 which implements Executive Order 11988. Specifically, these goals include:

a. the avoidance of the base floodplain;

b. the reduction of hazard and risk of flood loss;

c. the minimization of the impacts of floods on human safety, health and welfare; and

d. the restoration and preservation of the natural and beneficial floodplain values.

Returning lands in Allenville to nature will result in a positive contribution to the EQ account with the creation of additional riparian habitat. Before construction proceeds on the new community, the Section 221 Agreement will ensure the future use of the floodplain in a manner compatible with Federal floodplain management policy (see Appendix E).

TOTAL COSTS AND FIRST COSTS

Not all costs associated with this project can be counted as first costs since this would in fact amount to double counting. Some recoverable funds used for acquisition of real estate and relocation benefits, and consequently returned when the relocatees purchase these houses, are not counted as first costs. In fact, the payment of the relocation

benefits is tied to the purchase or rental of a comparable, safe, decent, and sanitary home. No payment, therefore, will actually be made, but rather a credit is allowed in the cost of a purchase of a home, for those families electing to move to the community relocation site. Table 6 differentiates total, first and NED costs.

COST SHARING

The net cost of this project is $3,723,000 as shown in Table 8. It is the intent to cost share the Federal and local costs on an 80/20 basis, as is authorized by Sec. 73b of the Water Resources Act of 1974. Expenditures by the State of Arizona for preliminary engineering and design for the relocation site during the preparation of the DPR will be given credit in project cost sharing.

Two other considerations which are unique to this project require minor modification of the 80/20 cost sharing formula. First, there are certain costs by both the Corps and the local sponsor which will not be shared. The Corps' expenses in preparing the DPR and Reconnaissance Report (total of $150,000) would be borne entirely by the Corps. Also, the State intends to supplement relocation expenses allowed by the Federal government in the total amount of $179,000. Because sharing these additional relocation expenses would be inconsistent with the Uniform Relocation Act, these costs will not be shared by the Federal government, but rather will be borne entirely by the State. The total of these costs (labeled "unshared" costs in Tables 7 and 8) ($329,000) is subtracted from the net projected costs ($3,723,000) to give a total shared cost of $3,394,000 (see Table 8). This is then apportioned, with 80% (or $2,716,000) being borne by the Federal government and 20% (or $678,000) being borne by the State. The net cost to the Federal government is the sum of its shared cost ($2,716,000) plus its unshared cost ($150,000) or $2,866,000. Similarly, the net cost to the State is determined to be $857,000 ($678,000 shared plus $179,000 unshared).

The second unique consideration is that all of the facilities constructed at the new site will be sold to inhabitants, resulting in: (1) the recovery of a part of the initial cost, (2) a net cost which is less than the initial cost, and (3) costs to each agency that vary throughout the period of construction and relocation. The total initial cost is estimated at $4,655,000 (again, see Table 8). An 80% Federal share of this cost would be $3,724,000 which would exceed the Corps' authority under Section 205 of the Flood Control Act of 1948, as amended. The sharing of initial costs and the recovery of costs takes into account the restraint that Corps' cost should at no time exceed the $3,000,000 limitation. The plan detailed in Table 7 and summarized in Table 8 is essentially that the Corps will cost share the initial costs up to the $3 million limit and that the State will bear 100 percent of all initial costs beyond that point. Then, as homes are sold and costs are recovered, the State will keep all of the initial costs borne solely by them (labeled "unshared recovered" costs in Tables 7 and 8). As funds continue to be received, these funds (labeled "shared recovered") will be recovered by the agencies on the 80/20 basis.

The effect of applying these two considerations is best understood by analyzing Table 8 with particular attention to "unshared recovered," "shared recovered," and "unshared" costs as defined above. Table 7 is a more detailed, sequential determination of the costs based on the cost sharing conditions.

TABLE 6

ESTIMATED COSTS

	1st Cost	Recoverable Costs	Total Costs	NED Costs
Structure[1] Acquisition Allenvile	$ 263,000[2]	$387,000	$ 650,000	$650,000
Razing[4] Allenville	110,000		110,000	110,000
Land Acquisition	32,000		32,000	32,000
Relocation Benefits	190,000[5]	347,000[6]	537,000	
Housing	852,000		852,000	
Community Center	216,000		216,000	
Park	247,000		247,000	
Site Development and Utilities	1,146,000		1,146,000	89,000[7]
Contingencies[8]	246,000		246,000	9,000
Supervision and[9] Administration	140,000		140,000	5,000
Design and Engineering	150,000		150,000	5,000
DPR			150,000	
Additional State[10] Contributed Benefits			179,000	
TOTAL	$3,592,000	$734,000	$4,655,000	$900,000

Footnotes for Table 6 and 7 follow Table 8.

TABLE 7

ALLENVILLE COST SHARING[11]

	Corps	State	Total
Structural[1] Acquisition		$ 650,000	$ 650,000
Razing[4] Allenville	$ 110,000		110,000
Land Acquisition		32,000	32,000
Relocation Benefits		537,000	537,000
Housing	852,000		852,000
Community Center	216,000		216,000
Park	247,000		247,000
Site Development and Utilities	1,146,000		1,146,000
Contingencies[8]	89,000	157,000	246,000
Supervision and[9] Administration	140,000		140,000
Design and Engineering	50,000	100,000	150,000
Totals			
Shared	2,850,000	1,476,000	4,326,000
Unshared	150,000	179,000	329,000
TOTALS	$3,000,000	$1,655,000	$4,655,000

TOTAL SHARED COST	4,326,000
80/20 Shared Cost[12]	-3,562,000
Unshared Recovered Cost	764,000
Recovered Costs[13]	932,000
Unshared Costs Recovered by the Local Sponsor	$ - 764,000
	$ 168,000

80% 20%

Shared Recovered Costs $134,000 $34,000

TABLE 8

COST RECAPITULATION

	Corps	State	Total
Initial Cost	$3,000,000	$1,655,000	$4,655,000
Unshared Recovered	-0-	-764,000	-764,000
	$3,000,000	891,000	3,891,000
Shared Recovered	-134,000	-34,000	-168,000
Net Cost	2,866,000	857,000	3,723,000
Unshared Costs	-150,000	-179,000	-329,000
Shared Costs	$2,716,000	$ 678,000	$3,394,000
	80%	20%	

FOOTNOTES

1. Acquisition costs are based upon January 1980 values of just the structures (not the land) provided by the Arizona Division of Emergency Services.

2. Acquisition costs not recoverable - i.e., appraised value of structures owned by businesses (the tavern and churches); non-resident home owners (landlords); and resident landowners electing not to move to the relocation site.

3. Acquisition costs paid to relocatees moving to the relocation site which will be recovered in the form of house sales.

4. Includes contingencies and supervision and administration.

5. Relocation benefits in accordance with PL 91-646 which will not be recovered - i.e., benefits to businesses (tavern and churches); residents not moving to the relocation site; and the $500 per family moving expense benefit.

6. Relocation benefits paid to relocatees moving to the relocation site which will be recovered in the form of house sales and improvements to mobile home lots.

7. Value of existing facilities in Allenville (see Appendix D for explanation).

8. Contingencies based on 10% of construction costs for housing, community center, park, and site development. This category of costs is used to balance the columns to insure that total initial Corps costs do not exceed Federal limitations in Table 7.

9. Supervision and administration based on 5% of construction costs for housing, community center, park, and site development for the Corps.

10. Relocation benefits in excess of those authorized by PL 91-646, to be provided by the local sponsor and not cost shared.

11. The breakdown between Corps and State of each category of shared costs denotes primary responsibility. Total shared costs are the basis for cost sharing.

12. Based on $2,850,000 (Federal limitation minus the DPR cost), equaling 80%, and therefore the corresponding non-Federal share, equaling 20% is $712,000 ($2,850,000 + $712,000 = $3,562,000).

13. Estimated market value of houses and improvements to mobile home lots.

ANALYSIS OF SELECTED PLAN - SUMMARY

Economics

Initial NED costs for the selected plan amount to $900,000. No operation or maintenance costs were counted since these costs are to be essentially the same as for the facilities replaced. Any additional costs are assumed to be offset by equal benefits. The NED costs annualized at a rate of 7-1/8 percent over 100 years would be $64,200. Total costs ($4,655,000) are considerably greater than the NED costs used for the economic analysis for a number of reasons. First, there are structural acquisition dollars and relocation benefits which will be recovered when the residents buy the new homes. Altogether $932,000 are expected to be recovered. Secondly, the costs of the DPR are not NED costs. Finally, the replacing of the substandard housing and facilities in Allenville with a safe, decent and sanitary community constitutes an improvement to the national well-being. The improvements above the existing conditions are not considered to accrue NED costs because the social benefits are assumed to at least equal the associated financial costs.

Average annual benefits are based on emergency costs prevented ($46,000), damages prevented to public utilities ($4,100) and those damages to homes and other structures which might reasonably be assumed to have been borne by the nation through subsidized flood insurance ($37,900). Additional, intangible benefits exist through the new land use at Allenville of open space and increased riparian habitat. These benefits add to the EQ account and are evaluated although no specific monetary benefit is claimed. The annual benefits come to $88,000, producing a benefit to cost ratio of 1.4. See Appendix D for details.

Environmental Effects

The selected plan - community relocation, has no significant long-term adverse environmental impacts. There will be no effects on surface or ground water. No filling will take place within waters of the United States, and a section 404(b) evaluation is not required. Air quality effects will be temporary - dust, smoke and exhaust emissions resulting from the construction activity. Noise resulting from the construction will be minimal. Ambient noise levels for the residents will increase as a result of the proximity of the Buckeye Airport to the new site. However, noise levels should be well within Federal and State limits for residential areas. No known cultural resources will be affected by the construction. This was verified by the State Historic Preservation Office (see Appendix A for correspondence). Some upland vegetation will be disturbed - but this will not significantly affect wildlife resources in the area. The relocation will have no effect on endangered species. Riparian habitat will be created by razing the old site and allowing the area to revegetate and be managed for wildlife purposes. This is consistent with the Executive Order 11988 on floodplain management. Relocation to the new site will improve the quality of drinking water available to the residents. The new site is subject to overspray of pesticides from adjacent agricultural lands. This is not anticipated to be a serious problem. (See Environmental Assessment for details.)

Social Effects

The selected plan will maintain the Allenville Community identity and the close-knit relationship of the residents. Relocation will provide upgraded housing for both home owners and renters. Community growth will be promoted by the removal of floodplain restrictions. No significant additional financial burden will be borne by the residents as a result of the relocation. Employment will not be affected. Local government finances will increase slightly as a result of higher property values and associated tax revenues. Public services and facilities will not be significantly affected. The transfer of ten children into Palo Verde Elementary School will not significantly stress the facility. Services required as a result of flooding and the associated displacement of residents will no longer be needed. The need for non-flood related emergency services will remain the same. The increased distance from Buckeye to the relocation site will not affect the provision of services, and will not cause significant transportation problems for the residents of Allenville. There will be no significant change in land use as a result of the conversion of 60 acres of open space to residential use. Nevertheless, a potential conflict exists here between residential and agricultural land uses as it does in the remainder of the Buckeye Valley agricultural areas. No impact to the adjoining State-leased farmland is presently anticipated. However, if pesticides become a serious problem, or future legislation requires buffer zones around agricultural areas, the adjoining farmland may be affected. (See Environmental Assessment for details.)

Public Views

Throughout the course of this study public views were solicited from the general public, as well as from government agencies at all levels and, of course, the residents of Allenville. Response has been, for the most part, favorable. No major controversies have been identified by State, local or Federal agencies or by the residents of Allenville concerning the relocation. Although there have been areas of concern raised by non-Allenville residents of the Buckeye Valley, no significant issues remain unresolved. See Appendix A for a complete discussion of public involvement, views and responses.

CONCLUSION

Various alternative solutions, both structural and nonstructural for flood control at Allenville, Arizona were examined. All but the relocation alternatives were not considered feasible because they either did not provide sufficient flood control for the community or were not economically justifiable. Public involvement and interagency coordination played an important role in the planning process and selection of the preferred alternative.

It is the conclusion of this study that the nonstructural alternative of permanent evacuation of the community of Allenville away from the Gila River floodplain to a site eight miles northwest of Buckeye, Arizona is the only economically justifiable and environmentally and socially acceptable flood damage reduction solution.

Upon approval of this report, completion of plans and specifications can follow quickly. Approval by May 1980 will allow contract award by August/September 1980. Nine months is the estimated construction time. This will place the residents of Allenville in their new community in just over three years from their evacuation in March of 1978.

RECOMMENDATIONS

The District Engineer Recommends:

That the Chief of Engineers adopt a project for the reduction of flood damages at Allenville, Arizona through relocation of that community in accordance with the authority contained in Section 205, Flood Control Act of 1948, as amended, and in accordance with the selected plan described in this report. This will be done at an estimated cost to the United States of $2,866,000 and $857,000 to the State of Arizona.

That prior to the commencement of construction, the non-Federal interests will enter into a written agreement satisfactory to the Secretary of the Army. Provisions of this agreement are included as Appendix E to this DPR.

GWYNN A. TEAGUE
COL, CE
District Engineer

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APPENDIX A

PUBLIC INVOLVEMENT, PUBLIC VIEWS, AND RESPONSES

PUBLIC INVOLVEMENT

Objective

The objective of the Allenville public involvement program was to provide a continuous two-way communication process which would:

- Promote full understanding of the manner and means by which the problems and needs are investigated and solutions are proposed.
- Provide an opportunity for a variety of interests within the community to understand diverse viewpoints and resolve possible conflicts.
- Allow residents to present their ideas and viewpoints regarding designs of the replacement community.

Program Overview

To meet the objective of the Allenville public involvement program, activities were conducted appropriate to plan development. Rather than being a fixed program, public involvement was flexible and monitored for effectiveness as the study progressed. The public involvement program, used as a vehicle for discussion of community desires, provided the opportunity of obtaining information concerning the acceptability of alternative plans.

In January 1979 coordination on Allenville between the State of Arizona and the Federal Disaster Assistance Administration (FDAA) began with meetings between State officials, the FDAA, and a representative of the Allenville community. The public involvement program began with the preparation in July 1979 of the Reconnaissance Report, Small Flood Control Project Authority, Gila River Basin, Allenville, Arizona by the Los Angeles District of the Corps of Engineers. This document contained background data and presented initial alternatives for the alleviation of Allenville's flooding problems.

Following publication of the Reconnaissance Report, a survey conducted by the State indicated that almost all of the residents of Allenville favored the evacuation alternative. On September 19, 1979, a meeting of Allenville residents was held in Buckeye, Arizona with representatives of the Corps and State to discuss the alternatives. A leaflet summarizing the study and alternatives was then prepared by the Corps of Engineers and distributed to Allenville residents and other concerned citizens, agencies, and organizations. This was followed by the initial formal public meeting held on September 28, 1979 at the Buckeye Union High School Auditorium, at which results of the study to date were presented.

At this meeting, the following issues were raised:

1. Concerns regarding the equitable nature of the proposed land exchange;

2. Nonresident landowners' concerns over the land exchange and future use of the present site of Allenville in the relocation alternative;

3. Concerns over the nearness to the Palo Verde Nuclear Generating Station;

4. Concerns regarding the quality of water at the proposed relocation site.

There was considerable confusion among the residents of Allenville regarding the proposed community relocation alternative. It was determined that details of this alternative could best be clarified for the people of Allenville through workshops with Corps and State representatives.

The first workshop was conducted on October 23, 1979 in Allenville by the State's Architect-Engineer and was attended by members of the Corps and State study teams. Descriptions of the relocation site plans were presented in detail and the ideas and preferences of the evacuees regarding the new location and housing designs were solicited. Following this, two petitions were circulated among Allenville residents. These petitions, signed by a majority of the citizens of Allenville, stated that they favored relocation as a community and acknowledged the Board of Directors of the Allenville Community for Progress, Inc. as their spokesman on matters pertaining to the community. A second public workshop was held in Allenville on January 24, 1980, to bring the residents up to date on the planning process and to discuss with them the preliminary designs and costs of homes at the new site.

The final formal public meeting occurred on April 2, 1980 at the Cafetorium of the Buckeye Elementary School. Findings of the Draft Detailed Project Report were presented at this gathering. A question and answer period followed at which the following issues were raised:

1. Possible harmful effects on the population from pesticide spraying adjacent to the relocation site;

2. Possible loss of cropland because of pesticide spraying restrictions;

3. Impacts resulting from the introduction of residential and commercial land uses into a rural area;

4. Concerns regarding the quality of water at the relocation site;

5. Impacts of large numbers of children from the new community on the Palo Verde Elementary School District;

6. Increased distance of the relocation site from services and facilities in Buckeye;

7. Opposition by upstream and downstream residents to transfer of the present Allenville site to the Arizona Department of Game and Fish once the structures are razed.

These concerns have largely been addressed in revised portions of the Main Report and Environmental Assessment of this Detailed Project Report. It also should be noted that the issues raised at the April public meeting came from farmers and non-Allenville residents from the surrounding area, most of whom believed that the relocation of Allenville would lessen chances for channelization or channel clearing of the Gila River from its confluence with the Salt River to Gillespie Dam. Persons from Allenville attending the meeting spoke out strongly in favor of the community relocation alternative.

COORDINATION

From the beginning of the Allenville Flood Damage Reduction Study, the Corps of Engineers has encouraged coordination with government agencies at the Federal, State, County, and local levels, as well as with interest groups and concerned citizens.

The Corps has coordinated the environmental work that has been performed at Allenville with the U.S. Fish and Wildlife Service, the Arizona Department of Game and Fish, the State Historic Preservation Officer, and the Soil Conservation Service. In order to make certain that the County park would be maintained at the relocation site, coordination was initiated with the Maricopa County Parks Department. The views of this agency agreeing to continue the park appear in a letter below. In addition, in order to insure proper use of the Old Allenville site following the razing of the structures, it was necessary to involve actively the Arizona Department of Game and Fish. A copy of a letter from Game and Fish expressing interest in managing the property in conformance with Federal floodplain management goals also is included in this appendix.

During the plan formulation process, letters were received from other agencies, interest groups, and private individuals commenting on the Allenville Flood Damage Reduction Study and on the Draft Detailed Project Report. These letters are reprinted in this appendix and, where applicable, issues raised in the correspondence are addressed on separate pages. Also included in this appendix are responses from the State A-95 Clearinghouse circulation of the DPR to State agencies. In addition, a list of agencies, individuals, and organizations to which copies of the DPR were sent for review follows:

Department of Housing and Urban Development

Farmers Home Administration

Environmental Protection Agency

Economic Development Administration

U.S. Fish and Wildlife Service

Arizona Congressional Delegation

Arizona Natural Heritage Program

Arizona Department of Health Services
(Bureau of Water Quality Control)

Arizona Office of Economic Planning and Development

Arizona Department of Transportation

Arizona Department of Game and Fish

Arizona State Parks Board

Arizona Commission of Agriculture and Horticulture

Arizona State Land Department

State Liaison Office, Arizona Outdoor Recreation
Coordinating Committee

Arizona Division of Emergency Services

Arizona Department of Economic Security

Arizona Water Commission

Arizona State Mine Inspector

Arizona State Clearinghouse

Arizona Mineral Resources Department

Maricopa County Health Department

Maricopa County Highway Department

Maricopa County Planning Department

Flood Control District of Maricopa County

Maricopa Association of Governments
(Planning and Transportation Office)

Maricopa County Supervisor, Ed Pastor

Citizens Concerned About the Project

Maricopa Audubon Society

City of Buckeye

Allenville Community for Progress, Inc.

COMMENTS AND RESPONSES

The following correspondence has been received and where necessary responses follow.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
215 Fremont Street
San Francisco, Ca. 94105

31 MAR 1980

Gwynne A. Teague
COL, CE
District Engineer for Arizona & Nevada
Department of the Army, Corps of Engineers
2721 N. Central Avenue, Suite 1028
Phoenix, AZ 85004

Dear Colonel Teague:

The Environmental Protection Agency (EPA) has reviewed the Environmental Assessment (EA) for the DRAFT MAIN REPORT - TECHNICAL APPENDICES AND ENVIRONMENTAL ASSESSMENT STUDY OF FLOOD DAMAGE REDUCTION FOR ALLENVILLE, ARIZONA.

The EPA has no comments to offer at this time. We appreciate the opportunity to comment on this EA and request three copies of the subsequent documents describing any National Environmental Policy Act (NEPA) actions.

If you have any questions regarding this project, please contact Susan Sakaki, EIS Coordinator, at (415)556-6925.

Sincerely yours,

Carl C. Kohnert, Jr.

Carl C. Kohnert, Jr., Director
Surveillance and Analysis Division

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE

Ecological Services
2934 W. Fairmount Avenue
Phoenix, Arizona 85017

March 28, 1980

Colonel Gwynn Teague
District Engineer
Corps of Engineers, U.S. Army
P.O. Box 2711
Los Angeles, CA 90053

Dear Colonel Teague:

We have reviewed the draft Main Report - Technical Appendices and Environmental Assessment Study of Flood Damage Reduction for Allenville, Arizona. The report presents a concise evaluation of the alternatives available to reduce such flooding damage in Allenville and adequately describes the biological resources that would be impacted by the implementation of each alternative.

We concur with the selection of community relocation in toto as the most viable solution to the flooding dilemma of the Allenville residents.

Sincerely,

Frank M. Baucom
Acting Field Supervisor

Comment Form: To Be Completed by Reviewing Agency

State Application Identifier (SAI)

TO:

Mr. Terry B. Johnson
Arizona Natural Heritage Program
30 North Tucson Boulevard
Tucson, Arizona 85716

MAR 11, 1980 State AZ No. 80-60-001

Economic Security	Health
Mineral Resources	Water
Game & Fish	Parks
Ag. & Hort.	Land
Mine Inspector	AORCC
Emergency Services	
Az. Natural Heritage Prog.	
Bu. of Geology & Mineral Tech.	
OEPAD: P. Bergthold	
J. Nelson	

FROM: Arizona State Clearinghouse
1700 West Washington Street, Room 505
Phoenix, Arizona 85007

Region I

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☒ No comment on this project ☐ Proposal is supported as written ☐ Comments as indicated below

1. Is project consistent with your agency goals and objectives? ☐ Yes ☐ No ☐ Not Relative to this agency

2. Does project contribute to statewide and/or areawide goals and objectives of which you are familiar? ☐ Yes ☐ No

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6. Does project adequately address the intended efforts on target population? ☐ Yes ☐ No

7. Is project in accord with existing applicable laws, rules or regulations with which you are familiar? ☐ Yes ☐ No

Additional Comments (Use back of sheet, if necessary):

Reviewers Signature Terry B. Johnson A-8

Coordinator AZNHP

Date 12 March 1980

Telephone 323-0867

8

Comment Form to be Completed by Reviewing Agency

State Application Identifier (SAI)

TO:

Dr. Suzanne Dandoy, Director
Department of Health Services
1740 West Adams Street
Phoenix, Arizona 85007

MAR 11, 1980 State AZ No. 80-60-0019

Economic Security	Health
Mineral Resources	Water
Game & Fish	Parks
Ag. & Hort.	Land
Mine Inspector	AORCC
Emergency Services	
Az. Natural Heritage Prog.	
Bu. of Geology & Mineral Tech.	
OEPAD: P. Bergthold	
J. Nelson	

FROM: Arizona State Clearinghouse
1700 West Washington Street, Room 505
Phoenix, Arizona 85007

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Additional Comments (Use back of sheet, if necessary):

Reviewers Signature R. Bruce Scott A-9

ASSISTANT DIRECTOR
ARIZONA DEPT OF HEALTH SERVICES
ENVIRONMENTAL HEALTH SERVICES

Date MAR 20 1980

Title

Telephone

Comment Form, To Be Completed by Reviewing Agency

TO:

J. Nelson
OEPAD
1700 W. Washington, Rm. 505
Phoenix, Arizona 85007

State Application Identifier (SAI)

MAR 11, 1980 State AZ No. 80-60-001

Economic Security	Health
Mineral Resources	Water
Game & Fish	Parks
Ag. & Hort.	Land
Mine Inspector	AORCC
Emergency Services	
Az. Natural Heritage Prog.	
Bu. of Geology & Mineral Tech.	
OEPAD: P. Bergthold	
J. Nelson	

FROM: Arizona State Clearinghouse
1700 West Washington Street, Room 505
Phoenix, Arizona 85007

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(OVER)

5. Does project violate any rules or regulations of your agency? ☐ Yes ☒ No

6. Does project adequately address the intended efforts on target population? ☐ Yes ☒ No

(OVER)

7. Is project in accord with existing applicable laws, rules or regulations with which you are familiar? ☒ Yes ☐ No

Additional Comments (Use back of sheet, if necessary):

Please note comments on back

Reviewers Signature [signature] A-10 Date 3-27-80

Title PLANNER Telephone 254920

4)

(1.) Proposed site is adjacent to Buckeye Municipal Airport. Problems of safety, noise, and conflicting land use, both current and especially future are not adequately addressed.

6)

(2.) Residents of Allenville currently reside within walking distance of shopping services and other facilities in Buckeye. The proposed site is eight miles distant from these facilities. The implication of this remote site on emergency services, shopping, schools, etc., especially in light of the generally low income levels of the target population and the increased cost of transportation have not been addressed.

1)
Potential, present and future noise impacts resulting from the proximity of the relocation site to the Buckeye Municipal Airport are adequately addressed in the Noise section, on page 26 of the Environmental Assessment. No significant effects are anticipated if the use of the southwest-northeast runway by small private jets is restricted in the future. The Health and Safety section of the Environmental Assessment has been revised to include the safety aspects of the use of the southwest-northeast runway. If expansion significantly increases airport activity, restrictions can be placed on the use of this runway. Land use conflicts are addressed in both the Land Use and Health and Safety sections, pages 34 and 29, respectively. The maximum impact which may result in the future would involve the loss of approximately 100 of 480 acres of state leased land adjacent to the relocation site presently in agricultural production.

2)
Allenville residents continue to depend upon the automobile for their transportation needs. Residents oftentimes carpool to and from shopping areas to save transportation costs, and therefore do not view the increased distance as a significant problem. The same emergency services will be available at the relocation site. School bus service from the relocation site to Palo Verde Elementary School is currently available. Information on these subjects is presented in the following sections of the Environmental Assessment: Transportation and Public Services.

State Application Identifier (SAI)

TO:

Art Auerbach, Supervisor
Socio Economic Analysis Section
Dept. of Transportation
206 So. 17th Ave., Rm. 310 B
Phoenix, Arizona 85007

MAR 11, 1980 State AZ No. 80-60-001

Economic Security
Mineral Resources
Game & Fish
Ag. & Hort.
Mine Inspector
Emergency Services
Az. Natural Heritage Prog.
Bu. of Geology & Mineral Tech.
OEPAD: P. Bergthold
J. Nelson
Health
Water
Parks
Land
AORCC

FROM: Arizona State Clearinghouse
1700 West Washington Street, Room 505
Phoenix, Arizona 85007

RECEIVED
MAR 12 1980
SOCIOECONOMIC ANALYSIS

Region I

This project is referred to you for review and comment. Please evaluate as to the following questions. After completion, return THIS FORM AND ONE XEROX COPY to the Clearinghouse no later than 17 WORKING DAYS from the date noted above. Please contact the Clearinghouse at 255-5004 if you need further information or additional time for review.

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7. Is project in accord with existing applicable laws, rules or regulations with which you are familiar? ☐ Yes ☐ No

Additional Comments (Use back of sheet, if necessary):

Reviewers Signature Art Auerbach A-13 Date 3/17/80

Title State Planner Telephone 261-7251

ARIZONA GAME & FISH DEPARTMENT

2222 West Greenway Road Phoenix, Arizona 85023 942-3000

February 8, 1980

Mr. Norman Arno
Chief, Engineering Division
Department of the Army
Corps of Engineers
P.O. Box 2711
Los Angeles, CA 90053

Re: Allenville Land

Dear Mr. Arno:

The Arizona Game and Fish Department is definitely interested in assuming the management of the lands near Allenville, provided a suitable agreement can be worked out. We would expect that all buildings and debri would be removed prior to our assuming the management responsibility. Except for possibly planting a few trees, that management would most likely consist of allowing natural vegetation to reclaim the area.

Sincerely,

Robert A. Jantzen
Director

RAJ:PMS:rss

ARIZONA STATE PARKS

1688 WEST ADAMS STREET
PHOENIX, ARIZONA 85007
TELEPHONE 602-255-4174

April 14, 1980

Norman Arno
Chief, Engineering Division
Los Angeles District, CORPS
U.S. Department of the Army
P.O. Box 2711
Los Angeles, California 90053

Re: Allenville Community Relocation
U.S. Army - CORPS

Dear Mr. Arno:

I have reviewed the documentation submitted by the U.S. Army Corps of Engineers on this proposed undertaking and have the following comments:

1. Based on the results of the cultural resource survey carried out by Archaeological Research Services (ARS), I am in agreement with the Corps of Engineers' tentative determination that the Allenville community relocation will result in no effect to significant cultural resources. This determination is based on the fact that significant cultural resources have not been discovered in either the proposed relocation site or the present site of Allenville.

2. My concurrence with a "no effect" determination is conditioned, however, by the stipulation that should significant subsurface cultural remains be discovered during the archaeological monitoring of the razing of the Allenville buildings, the CORPS will carry out the necessary steps in 36 CFR Part 800.4 for preserving historic and cultural properties.

Your continued cooperation is appreciated, and if I can be of further assistance, please contact Frank Fryman, of my staff, at (602) 255-4174.

Sincerely,

James E. Ayres
State Historic Preservation Officer

JEA:FBF:bks

Comment Form To Be Completed by Reviewing Agency

TO:

Mr. James R. Carter, Director
Agriculture & Horticulture Dept.
421 Capitol Annex West
Phoenix, Arizona 85007

State Application Identifier (SAI)

MAR 11, 1980 State AZ No. 80-60-0019

Economic Security	Health
Mineral Resources	Water
Game & Fish	Parks
Ag. & Hort.	Land
Mine Inspector	AORCC
Emergency Services	
Az. Natural Heritage Prog.	
Bu. of Geology & Mineral Tech.	
OEPAD: P. Bergthold	
J. Nelson	

FROM: Arizona State Clearinghouse
1700 West Washington Street, Room 505
Phoenix, Arizona 85007

RECEIVED
MAR 13 1980
ARIZONA COMMISSION OF AGRICULTURE & HORTICULTURE

Region I

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Additional Comments (Use back of sheet, if necessary):

Reviewers Signature James R. Carter Date 3/14/80

Title Director A-16 Telephone 255-4373

Arizona Commission of
Agriculture and Horticulture
1688 WEST ADAMS • PHOENIX, ARIZONA 85007 • (602) 255-4373

March 4, 1980

Col. Gwynn A. Teague, C.E.
Department of the Army
Los Angeles District, Corps of Engineers
Phoenix Urban Study Office
2721 North Central Avenue, Suite 800
Phoenix, Arizona 85004

Re: Flooding Problems Along the Gila River, Arizona

Dear Col. Teague,

In response to your request to attend a meeting on Allenville, please be advised that I believe the flood hazard that exists along the entire Gila River drainage must be considered as a whole.

Piecemeal studies will not give the information to adequately provide the alternatives from which judgments might be made.

Additionally, studies of upstream portions of the drainage will result in solutions which will insure downstream portions. To me, it is important that, if only a portion of a drainage can be studied, that the progression be from the lowest end and then upstream in sequence without a skip.

I believe these studies will indicate that this drainage needs a designated channel in those reaches below irrigation and flood storage dams. It will be shown there is a need for some flood control device that can handle a minimum of 900,000 acre feet above the Phoenix Metro area on the Salt-Verde, and the completion of the New River-Aqua Fria control dams.

These designated channels will have to be cleared regularly in the same fashion that floods would scour them if storage dams were not in place.

Sincerely,

James R. Carter

James R. Carter
Director

JRC/ls

Comment Form To Be Completed by Reviewing Agency

State Application Identifier (SAI)

TO:

Charles A. Ott, Jr. Director
Div. of Emergency Services
5636 East McDowell Rd.
Phoenix, AZ 85008

MAR 11, 1980 State AZ No. 80-60-003

Economic Security	Health
Mineral Resources	Water
Game & Fish	Parks
Ag. & Hort.	Land
Mine Inspector	AORCC
Emergency Services	
Az. Natural Heritage Prog.	
Bu. of Geology & Mineral Tech.	
OEPAD: P. Bergthold	
J. Nelson	

FROM: Arizona State Clearinghouse
1700 West Washington Street, Room 505
Phoenix, Arizona 85007

Region I

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Additional Comments (Use back of sheet, if necessary):

Reviewers Signature Sammy Owen A-18 Date March 13 1980

Title State Planner Telephone 273-9880

State Application Identifier (SAI)

TO: Ms. Bette DeGraw, Ass't. Dir.
Div. of Planning & Policy Dev.
Dept. of Economic Security
1717 W. Jefferson Street
Phoenix, Arizona 85007
Site Code: 045Z

MAR 11, 1980 State AZ No. 80-60-0019

Economic Security	Health
Mineral Resources	Water
Game & Fish	Parks
Ag. & Hort.	Land
Mine Inspector	AORCC
Emergency Services	
Az. Natural Heritage Prog.	
Bu. of Geology & Mineral Tech.	
OEPAD: P. Bergthold	
J. Nelson	

FROM: Arizona State Clearinghouse
1700 West Washington Street, Room 505
Phoenix, Arizona 85007

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Additional Comments (Use back of sheet, if necessary):

Reviewers Signature John R Filby (Col) A-19 Date 3-21-80

Title District Administrator Telephone 255-3729

Comment Form To Be Completed by Reviewing Agency

TO:

Mr. Wesley E. Steiner,
State Water Commission
222 N. Central Ave., Suite 800
Phoenix, Arizona 85004

State Application Identifier (SAI)

MAR 11, 1980 State AZ No. 80-60-001

Economic Security	Health
Mineral Resources	Water
Game & Fish	Parks
Ag. & Hort.	Land
Mine Inspector	AORCC
Emergency Services	
Az. Natural Heritage Prog.	
Bu. of Geology & Mineral Tech.	
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J. Nelson	

FROM: Arizona State Clearinghouse
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Additional Comments (Use back of sheet, if necessary):

Reviewers Signature YCan A-20 Date 3-18-80

Title Telephone

State Application Identifier (SAI)

TO:

State Mine Inspector
Room 705, West Wing
Capitol
Phoenix, AZ 85007

MAR 11, 1980 State AZ No. 80-60-001

Economic Security	Health
Mineral Resources	Water
Game & Fish	Parks
Ag. & Hort.	Land
Mine Inspector	AORCC
Emergency Services	
Az. Natural Heritage Prog.	
Bu. of Geology & Mineral Tech.	
OEPAD: P. Bergthold	
J. Nelson	

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Phoenix, Arizona 85007

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Additional Comments (Use back of sheet, if necessary):

Reviewers Signature James H. McCutcheon Date 26 Mar 80

Title State Mine Inspector Telephone

Comment Form, To Be Completed by Reviewing Agency

State Application Identifier (SAI)

TO:

Mr. John Jett, Director
Mineral Resources Dept.
Fairgrounds, Mineral Bldg.
1826 West McDowell Road
Phoenix, Arizona 85007

MAR 11, 1980 State AZ No. 80-60-0019

Economic Security	Health
Mineral Resources	Water
Game & Fish	Parks
Ag. & Hort.	Land
Mine Inspector	AORCC
Emergency Services	
Az. Natural Heritage Prog.	
Bu. of Geology & Mineral Tech.	
OEPAD: P. Bergthold	
J. Nelson	

FROM: Arizona State Clearinghouse
1700 West Washington Street, Room 505
Phoenix, Arizona 85007

Region I

This project is referred to you for review and comment. Please evaluate as to the following questions. After completion, return THIS FORM AND ONE XEROX COPY to the Clearinghouse no later than 17 WORKING DAYS from the date noted above. Please contact the Clearinghouse at 255-5004 if you need further information or additional time for review.

☒ No comment on this project ☐ Proposal is supported as written ☐ Comments as indicated below

1. Is project consistent with your agency goals and objectives? ☐ Yes ☐ No ☐ Not Relative to this agency

2. Does project contribute to statewide and/or areawide goals and objectives of which you are familiar? ☐ Yes ☐ No

3. Is there overlap or duplication with other state agency or local responsibilities and/or goals and objectives? ☐ Yes ☐ No

4. Will project have an adverse effect on existing programs with your agency or within project impact area? ☐ Yes ☐ No

5. Does project violate any rules or regulations of your agency? ☐ Yes ☐ No

6. Does project adequately address the intended efforts on target population? ☐ Yes ☐ No

7. Is project in accord with existing applicable laws, rules or regulations with which you are familiar? ☐ Yes ☐ No

Additional Comments (Use back of sheet, if necessary):

Reviewers Signature J. L. Jett A-22 Date 3-13-80

Title Telephone

JIM HARTDEGEN
P. O. BOX 64
CASA GRANDE, ARIZONA 85222
HOME: 836-1107
CAPITOL: 255-5549
1-800-352-8404 (TOLL FREE)

COMMITTEES:
NATURAL RESOURCES & ENERGY, VICE CHAIRMAN
AGRICULTURE
COMMERCE
ENVIRONMENTAL AFFAIRS

Arizona House of Representatives

Phoenix, Arizona 85007

THIRTY-FOURTH LEGISLATURE

March 4, 1980

Colonel Gwynn A. Teague, CE
District Engineer
Department of the Army
Phoenix Urban Study Office
2721 N. Central Avenue, Suite 800
Phoenix, AZ 85004

Dear Colonel Teague:

I received your notice of the Allenville damage reduction meeting to be held in Buckeye on April 2. It would seem to me that the Army Corps of Engineers is not aware of the efforts to relocate the people of the Allenville community to high and dry ground. However, there is an area that desperately needs flood reduction--about 15-20 miles up the Gila River from Allenville--in the area of Holly Acres.

These people will not be relocated, but do need channelization of the river and some diking along the river. It seems like we, in all levels of government, have turned a deaf ear. If you really want to do something good for some deserving people, help the people in Holly Acres.

If I can be of any service to you in this matter, do not hesitate to contact me.

Sincerely,

JIM HARTDEGEN
State Representative

JH/pas

cc: Mr. Jerry Hill, President
Holly Acres Flood Control Association

PARKS AND RECREATION DEPARTMENT
4701 East Washington Street
Phoenix, Arizona 85034
(602) 262-3711

February 14, 1980

LTC Joseph E. Gross
Arizona/Nevada Area Engineer
U.S. Army Corps of Engineers
2721 North Central Avenue, Suite 800
Phoenix, Arizona 85004

Dear LTC Gross:

In a meeting held November 13, 1979, the Maricopa County Parks and Recreation Commission reviewed and accepted the plans for the recreation development at the proposed new Allenville Community site.

The Maricopa County Parks and Recreation Department agrees to be responsible for the operation, maintenance and replacement without costs to the Government of all recreation facilities within the community park on the Allenville site.

Sincerely,

R.H. Milne

Robert H. Milne
Director

M:v

CC: Neil Irwin
U.S. Army Corps of Engineers
2721 North Central Avenue, Suite 800
Phoenix, Arizona 85004

FLOOD CONTROL DISTRICT
of
Maricopa County

3335 West Durango Street • Phoenix, Arizona 85009
Telephone (602) 262-1501

William D. Mathews, P.E., Chief Engineer and General Manager

March 31, 1980

Colonel Gwynn A. Teague, District Engineer
U. S. Army Engineer District
P. O. Box 2711
Los Angeles, California 90053

RE: Draft Main Report - Technical Appendices and Environmental Assessment Study of Flood Damage Reduction for Allenville, Arizona

Dear Colonel Teague:

The subject report has been reviewed by our office. The following comments have been made both from the standpoint of the Flood Control District and from the standpoint of our responsibility as the stormwater drainage review agency for the Unincorporated Area of Maricopa County.

(1) The proposed site of the relocated community of Allenville is immediately below the Buckeye Watershed Flood Retarding Structure No. 1. As you are aware that structure has been found to be structurally deficient and has been declared unsafe. Repair work under the direction of the Soil Conservation Service is currently scheduled to begin the end of May 1980.

(2) In regard to the onsite drainage plan for the proposed development the Maricopa County onsite stormwater detention requirement states that the peak 100-year runoff from the site may not be increased by development. The basis for the subdivision design for detention facilities is the 100-year 2-hour storm. The report refers to the 100-year, 22-hour storm which appears to be a typographical error. The report also states that the runoff being detained will be discharged slowly after the storm is over. It should be noted that the County requires that detained runoff not be ponded longer than 60 hours.

(3) We recommend that the onsite and offsite drainage analysis be submitted to the Maricopa County Planning and Zoning Department.

Sincerely,

D E Boyd

FOR W. D. Mathews, P. E.

1)
Repairs on this dike are scheduled to begin in the summer of 1980. Opening of bids will be in May 1980, with repair work anticipated to take no more than six months. Repairs on the dike, therefore, will be finished before the relocation site is occupied.

2)
The typographical error referred to has been corrected in the Design and Cost Appendix, Appendix C of this Detailed Project Report.

3)
All plans for the new community will be submitted to the Maricopa County Planning and Zoning Department for plat approval.

MARICOPA•ASSOCIATION•OF•GOVERNMENTS

1820 WEST WASHINGTON PHOENIX, ARIZONA 85007 (602) 254-6308

TO: Mr. Mark Frank, MAG 208

FROM: Clearinghouse Staff Contact: Joyce Akazawa

SUBJECT: PROJECT NOTIFICATION AND REVIEW

Applicant: U. S. Army Corps of Engineers

Project Title: ALLENVILLE FLOOD DAMAGE REDUCTION STYDY, ETC

State Application Identifier: 80-60-0019

MAG Log Number: 0343

Date Due: ~~April 1, 1980~~ 3/20/80

A copy of an A-95 application form AZ-189 along with supporting project documentation is attached for your review and comment in accordance with requirements of OMB Circular A-95. Please review the proposal as it affects the plans and programs of your agency and register your response below. Please return ONLY THIS completed form by the date noted above.

☒ No comment on the above project ☐ Proposal is supported as written ☐ Comments as indicated below

1. Is project consistent with your agency goals and objectives? ☐ Yes ☐ No ☐ Not Relative to this agency
2. Does project contribute to statewide and/or areawide goals and objectives of which you are familiar? ☐ Yes ☐ No
3. Is there overlap or duplication with other state agency or local responsibilities and/or goals and objectives? ☐ Yes ☐ No
4. Will project have an adverse affect on existing programs with your agency or within project impact area ☐ Yes ☐ No
5. Does project violate any rules or regulations of your agency? ☐ Yes ☐ No
6. Does project adequately address the intended efforts on target population? ☐ Yes ☐ No
7. Is project in accord with existing applicable laws rules or regulations with which your are familiar? ☐ Yes ☐ No

Additional Comments (Use back of sheet, if necessary)

Reviewers Signature Mark Frank Date 3/31/80

Comment Form To Be Completed By Reviewing Agency

State Application Identifier (SAI)

TO:

John J. DeBolske, Exec. Dir.
Maricopa Ass'n of Governmen
1820 W. Washington Street
Phoenix, AZ 85007

0343

MAR 11, 1980 State AZ No 80-60-001

Economic Security	Health
Mineral Resources	Water
Game & Fish	Parks
Ag. & Hort.	Land
Mine Inspector	AORCC
Emergency Services	
Az. Natural Heritage Prog.	
Bu. of Geology & Mineral Tech.	
OEPAD: P. Bergthold	
J. Nelson	
Transportation	

FROM: Arizona State Clearinghouse
1700 West Washington Street, Room 505
Phoenix, Arizona 85007

Region I

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Additional Comments (Use back of sheet, if necessary):

Reviewers Signature Ken Longyear A-28 Date 3/24/80

Comment Form To Be Completed by Reviewing Agency

State Application Identifier (SAI)

TO:

MAG-Transportation Planning Off.
ATTN: Ron Ross
1801 W. Jefferson, Rm. 325
Phoenix, AZ 85007

MAR 11, 1980 State AZ No. 80-60-0019

Economic Security	Health
Mineral Resources	Water
Game & Fish	Parks
Ag. & Hort.	Land
Mine Inspector	AORCC
Emergency Services	
Az. Natural Heritage Prog.	
Bu. of Geology & Mineral Tech.	
OEPAD: P. Bergthold	
J. Nelson	
Transportation	

FROM: Arizona State Clearinghouse
1700 West Washington Street, Room 505
Phoenix, Arizona 85007

Region I

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7. Is project in accord with existing applicable laws, rules or regulations with which you are familiar? ☐ Yes ☐ No

Additional Comments (Use back of sheet, if necessary): Attached for your review are pertinent sections from the MAG Recommended Aviation System Technical Report concerning the Buckeye Municipal Airport which lies adjacent to the Allenville relocation site. The Town of Buckeye should be consulted as to their plans for the Airport. (1)

Reviewers Signature Thomas E. Ford Date 3-25-80

Title Regional Planner Telephone 261-7867

1)

Potential noise and safety impacts that may result from the proximity of the relocation site to the Buckeye Airport are discussed on pages 26 and 30 of the Environmental Assessment. The town of Buckeye has been consulted regarding its plans for the Buckeye Airport. Results of this consultation were incorporated into the plan formulation process.

Citizens Concerned About the Project

P.O. Box 2628 • Phoenix, Arizona • 85002

28 September 1979

Corps of Engineers
Phoenix Urban Study Office
2721 N. Central Ave #800
Phoenix, Az. 85004

Dear Sir:

Unfortunately we will not be able to send a representative of our organization to the 28 Sept. Public Hearing in Buckeye on Allenville Flood problems. We would, however, like to submit the following comments for the record.

Your Informational Leaflet states: "A preliminary investigation based upon an economic analysis of the alternatives indicates that permanent evacuation (relocation) of Allenville residents is perhaps the best solution to the flood problems faced by this community."

Based upon the results of your further investigations, we strongly endorse this novel approach and note that it is the only really permanent solution to this flood problem.

The Corps is to be commended for this imaginative and innovative solution which is a welcome addition to the arsenal of flood control alternatives.

Sincerely,

Frank Welsh, P.E. J.D.
Executive Director

The Maricopa Audubon Society
4619 East Arcadia Lane • Phoenix, Arizona 85018

September 28, 1979

L.A. District; Corps of Engineers
Phoenix Urban Study Office
2721 N. Central, Suite 800
Phoenix 85004

Dear Sirs:

Our Society would like the following comments entered into the record since we will not attending the Allenville Flood Control Public Hearing on September 28, 1979.

We strongly endorse the relocation alternative and congratulate the Corps of Engineers for investigating this far sighted solution.

We further note that Allenville was located in the floodplain well before Arizona passed its 1973 floodplain law. The enforcement of that law will be greatly facilitated by your proposed solution.

Sincerely,

Robert A. Witzeman

Robert A. Witzeman
Conservation Chairman

CITIZENS FOR WATER AND RESOURCE MANAGEMENT, INC.
Star Rt. ~~xxxxxxxxx~~ One, Box 105
BUCKEYE, ARIZONA 85326

KYLE HINDMAN - CHAIRMAN PHONE 386-4071
MRS. MURRAY JOHNSON - CO-CHAIRMAN PHONE 386-2042

April 2, 1980

Department of the Army
Los Angeles District, Corps of Engineers
Phoenix Urban Study Office
2721 North Central Ave. Suite 800
Phoenix, Arizona 85004

Gentlemen:

I am a native of Arizona, and also a citizen of the Palo Verde area. My family and I oppose the relocation of Allenville because we believe channeling the Gila River is the ONLY SOLUTION to the flooding problem. You well know, the reason for flooding has been caused by phreatophyte in the river bed, along with the twenty two feet high Gillespie Dam which is just a waterfall without any flood gates. We have picture of the Gila River taken in 1919 which most of you have seen. This proves there was NO vegetation in the Gila during that time. Salt Cedars are native to Asia and NOT the U.S.A.; their importation has caused untold heartache and damage because their intense jungles in the middle of the Gila River will not let the water go in its natural course.

I feel the relocation of Allenville is unfair to the people of Palo Verde, Arlington, Buckeye, Rainbow Valley, Hawley Acres and to the taxpayers. This is a political move showing preferential treatment to one segment of our area when others along the Gila have not had help. What about the community of Arlington who have suffered untold loss and heartache because phreatophyte and Gillespie Dam has forced the river channel through their homes, school and over prime farmland? What are you doing for them? Where is your consideration of more than 500 families in Rainbow Valley who are left stranded in every flood and have to travel a long way to get to work, school and places of business? (1)

Many of the people of Allenville do not want to move. They now are near shopping centers the health clinic and places of employment. (2) Older people who enjoy meals at the Senior Citizens Center would have to travel many miles in order to partake of the hot lunch program the county provides. (3) What about the energy crisis? You are forcing them to be a long way from town and at the price of gasoline today, I don't think they can afford to live out like that.

CITIZENS FOR WATER AND RESOURCE MANAGEMENT, INC.
Star Rt. 1 [redacted] Box 105
BUCKEYE, ARIZONA 85326

KYLE HINDMAN - CHAIRMAN PHONE 386-4071
MRS. MURRAY JOHNSON - CO-CHAIRMAN PHONE 386-2042

(4) Who is financing all this move? You are using taxpayers money, right? Why not, then, let the taxpayers have a say in how their
(5) tax dollars are spent? In President Carter's "Inflation package" interest rates were increased to 20%. What interest rates do you intend to impose on the citizens of Allenville?

(6) We, the people of Palo Verde just happen to like living in a small community. We think it is unfair and unjust to increase our population without the consent of the people you are imposing upon. UNEQUAL RIGHTS is NOT what the founders of the United States government had in mind. Where is the government of the people, by the people, and for the people? Why not let the people of Palo Verde vote and have their say before you try to enforce an issue on its citizens? Have you ever done an
(7) environmental action study to get the reaction of the Palo Verde Community? If you had investigated, you would have had a land-slide vote against using our tax dollars to finance such a move.

The people of Palo Verde are uniting like the ones in the Litchfield Park area. We plan to fight if you do not reconsider this move.

Sincerely yours,

Lola Johnson

Lola Johnson

(8) How come you cut all the red tape for Allenville yet you can not cut red tape for others?

1)
The Corps of Engineers is presently engaged in a study of the flood problems and potential solutions along the Salt, Verde and Gila Rivers. Studies to date indicate that none of the preliminary alternatives being investigated by that study would provide adequate protection for the residents of Allenville. Because of the relatively small scope of the flooding problems at Allenville, the Corps was able to use its Small Projects Authority to recommend a solution to the problem. Relocation of Allenville does not preclude other, more comprehensive solutions to flooding in the other parts of the Gila River Basin.

2)
Allenville residents have repeatedly expressed a desire to move, either to the relocation site with the community or individually to locations in Buckeye. Forty families in Allenville, all of the homeowners and renters who intend to relocate to the new site, have signed letters of intent to the State to that effect.

3)
The issue of transportation of Allenville residents to places of work and necessary services has been addressed in the Environmental Assessment of this DPR. The move to the relocation site will not place additional significant transportation inconveniences on the residents of Allenville. Transportation to and from the County hot lunch program will be provided.

4)
The Corps of Engineers has conducted a public involvement program as part of this study. Several meetings were held with Allenville residents. Information leaflets regarding the progress of the study were distributed and two formal public meetings were held to discuss the status of the project. These meetings were publicized in newspapers and on radio. Throughout the duration of the study, public comment has been invited.

5)
The Federal government is not directly involved in arranging personal financing for the relocated residents. The goal of the Division of Emergency Services is to leave the relocated residents in a financial situation similar to that which they experienced prior to the March 1978 floods. Mortgages or loans, if required, will be handled on an individual basis.

6)
The relocation site is approximately the same distance from the unincorporated settlement of Palo Verde as is the existing community of Allenville. The selected plan, therefore, will not affect the population of Palo Verde.

7)
Since the relocation of Allenville would have no effect on Palo Verde, its population, demographic makeup or socio-economic structure, an environmental assessment regarding the effect of Allenville's relocation upon Palo Verde was not

warranted. Numerous public meetings were held during which public opinion and ideas were solicited.

8)
See response number one.

JAMES H. GREEN, JR.
ATTORNEY AT LAW
11 LUHRS ARCADE
11 WEST JEFFERSON STREET
PHOENIX, ARIZONA 85003
TELEPHONE 252-5788

April 7, 1980

Mr. Neil Erwin
Allenville Project Manager
U.S. Army Corps of Engineers
2721 North Central
Phoenix, Arizona 85004

Dear Mr. Erwin:

The Buckeye-Harquahala Area Plan Citizens Planning Committee has recently been appointed by the Maricopa County Planning and Zoning Commission. I am a member of that committee, representing the Palo Verde sub-area, and on March 5, 1980, I was elected chairman of the committee. One of the purposes of the Citizens Planning Committee is to provide comment, in an advisory capacity, to the Maricopa County Planning and Zoning Commission, and staff. To that end it is the responsibility of the committee to identify citizen attitudes, area problems and issues, to develop goals and objectives, and to recommend a land use plan for the area.

(1) It is clear that the proposed relocation of the community of Allenville into the existing farming community of Palo Verde, Arizona would have a major impact upon the school, the property owners, farms, and residents of the area. For that reason, it seems

(2) appropriate to me that the Citizens Planning Committee should be afforded an opportunity to review your draft report on the Allenville project and to consider the proposed relocation in detail, and to then have an opportunity to make such comment as the committee may desire to make for inclusion in your final report. I made such a request at the public hearing in Buckeye on Wednesday, April 2, 1980.

On Thursday, April 3rd, I visited your office and obtained a draft copy of the Detailed Project Report, dated March, 1980, which has been prepared by the U.S. Army Corps of Engineers on the Allenville project. I asked you on that date if it would be possible for those interested to present a letter or written statement which could be made a part of the final report. You indicated to me that in order to ensure the incorporation of any additional comment in that report, it would need to be received by you by Monday, April 7,

1980. You also indicated that the statements of those who spoke on April 2 in opposition to the relocation site and plan, including those from Allenville itself, would not be transcribed and made a part of your final report. (3)

I then reviewed your draft report and found that it states, in effect, that no major controversies or unresolved issues exist regarding the proposed relocation plan. Based upon the number and nature of the objections which were raised by those who spoke on April 2, it is obvious that your draft report must be corrected and revised to show that there are a substantial number of unresolved issues and that there is widespread and vocal opposition to the proposed site, both from members of the general public, and from members of the Allenville community. (4)

I am concerned, from what I have been told regarding the rush to put the draft report into final form, that the final report, like the draft, might ignore or minimize the objections which have been voiced. I would hope that your final report would reflect that at the meeting of April 2, 1980 in Buckeye the following were some of the issues raised, and objections made, to the proposed relocation site or plan:

1. There were criticisms of the site by residents of Allenville because of the distance from the town of Buckeye, and the problems of transportation.

2. Objection was made to the location of a bar and tavern at the proposed site as a part of the relocation plan. (Page 52, draft report.)

3. There were questions and objections raised by farmers who farm land near the proposed site because of the restrictions which would be imposed upon their farming practices, and specifically the application of necessary chemical sprays on crop lands.

4. Questions were raised and not answered as to the quality of the water available at the proposed site.

5. Questions were raised as to the legality and public policy of a plan which would perpetuate and promote racial segregation.

6. The advisability of locating a community adjacent to the Buckeye municipal airport was questioned.

7. Questions were raised concerning the immediate and potential impact on the Palo Verde School District and the failure to provide the district with adequate information as of April 2, 1980.

As a result of these and other questions and objections raised at the hearing on April 2, 1980, it would seem to be appropriate for the Corps of Engineers to withhold the issuance of its final report on the Allenville project until the Citizens Planning Committee has had a full opportunity to consider the material contained in your draft report and to provide such comment to the Corps of Engineers and other entities as the Committee members deem appropriate.

Attached hereto, and by reference made a part hereof, is a copy of an article from the Buckeye Valley News of March 27, 1980. I believe you will note, in reading it, a sense of the community that the Allenville project is being "rushed through" in order to make it an "accomplished fact" before interested citizens have sufficient information to enable them to effectively object to the relocation site or plan should they desire to do so. (5)

I would hope that no one connected with the promotion of the project desires to "shove it down the throats" of those in Allenville who don't want to relocate at the proposed site or of those now in the Palo Verde site area or of the public in general. Certainly the Corps of Engineers has enjoyed such an excellent reputation over the years that it would not want to be a party to such a process. (6)

Please be assured that your consideration in this matter will be greatly appreciated.

Very truly yours,

James H. Green, Jr., Chairman
Buckeye-Harquahala Area Plan
Citizens Planning Committee

JHG/mj
Encl.

Allenville Flood Relocation Meeting Set Next Wednesday

Next Wednesday, April 2, the Army Corps of Engineers will hold another meeting here to discuss the next phase of the Allenville flooding problem. The meeting will be held at the Buckeye Elementary School Cafetorium at 7 p.m.

This meeting is required by law when dealing with relocation problems. A news release from the Corps indicates that several options are still open pertaining to solutions to the Allenville flooding situation. The public is invited to the upcoming meeting to listen to the proposals and make comments.

However, as previously reported in the Feb. 14 issue of this newspaper, the Arizona Division of Emergency Services has already taken steps to relocate Allenville. And the new site is still designated as the area east of Palo Verde Road and just south of Interstate 10.

A further indication of the choice site was made known last week by a request from Maricopa County to the Town of Buckeye to review an application for rezoning of the land in question. While the new Allenville site is outside of the Buckeye City limits, the county frequently asks for comments from the nearest incorporated cities in order to coordinate future planning.

The county included a map with its request to the town which located new Allenville south of I-10 and just east of Palo Verde Road across from the Buckeye Municipal Airport. See the map at lower right . This land is currently zoned as rural. The county wants to zone it both residential and commercial.

At its regular meeting a week ago Tuesday, the Buckeye Council took up the matter and agreed that it had no objection to re-zoning. This further clears the way for Allenville re-location to that site.

The Army Corps of Engineers has been charged with re-building the community. Its acceptance of this responsibility went through the bureaucratic paper maze in record time. But it must conduct public meetings during various phases of the project in order to inform people of its plans and receive "input", which is one of the most popular terms around these days.

According to the state Division of Emergency Services, when contacted prior to the last article, there is little doubt that Allenville will be relocated to the site about eight miles northwest of of here. The land exchange has been all arranged and estimators have established prices for the existing homes in old Allenville.

Land will be traded, the money received for old Allenville homes will be applied to new houses to be constructed by the Corps, and residents will be able to move without further costs. About 41 families are expected to form the new Allenville.

Even if an Allenville resident was squatting on the land and had neither a house to appraise nor property to exchange, the Federal Relocation Act allows that resident up to $4,000 to make a move. In that event, the state will sell the squatter a piece of river-bottom land for a low price, then use that as the exchange parcel and the feds will sell him a government mobile home very cheap so that he too can move to new Allenville without being forced to come up with cash of his own. In fact, he should have money left over after the transactions.

Thus new Allenville will consist of about half permanent homes and half mobile homes.

The meeting next Wednesday has been called to discuss the problems of Allenville. Some people around here feel that the land exchange is illegal. The state owns that property near Palo Verde Road an and the freeway, but according to some, state land cannot be exchanged except at equal value. They claim that the land near the freeway is far more valuable than land near the river bottom. Someone is likely to bring up that point at the meeting.

Others would like to address the problem of continual flooding along the Gila which affects many in this area in addition to the Allenville folks. No doubt they will have opportunity to present their views, but this particular meeting is designed to discuss the Allenville situation. It is doubtful whether questions on another, although similar, topic will bring any satisfaction. However, you can try.

In any event, the Wednesday evening meeting will be a good place to let off a little steam. You might even learn something new -- but don't count on it.

A-40

1)
The relocation site is not within the boundaries of Palo Verde and is, in fact, further removed from PaloVerde than the original site of Allenville. Studies done for this report indicate that the relocation will not have a significant affect on Palo Verde Elementary School, or the property owners, farmers, and residents of Palo Verde.

2)
This report has been in preparation since September of 1979. A number of public meetings have been held and public input has been actively solicited. While the schedule for finalizing this report will not be altered, efforts have and will continue to be made to include all public comments to the extent possible, including comments from the Buckeye-Harquahala Area Plan Citizen's Planning Committee.

3)
The public meeting held on 2 April 1980 was transcribed and copies are available from the Corps of Engineers Office, Suite 800, 2721 N. Central Av., Phoenix, Arizona. While the Corps does not include a copy of the transcript in any report, the issues raised at the public meeting have been summarized in the Environmental Assessment and have been addressed in this report. Copies of the transcript are forwarded to Corps reviewing authorities.

4)
Sections of the Detailed Project Report and Environmental Assessment have been expanded to include all of the views and concerns raised at the 2 April 1980 public meeting. For information regarding these issues, refer to the following sections of the Environmental Assessment: Public Concerns, Water Quality Noise, Health and Safety, Land Use, and Transportation. See also Appendix A. Regarding the segregation issue, Allenville community members and the Corps have discussed the two relocation alternatives -- individual relocation and community relocation. Most of the residents expressed a strong desire to relocate as a community because there is a strong sense of cohesion and interdependence inherent in the community. The community relocation alternative was the plan preferred by the Allenville residents and is the plan recommended by this report.

5)
Throughout the course of the study, public views have been solicited and information regarding the study has been available to the public. A number of public meetings and workshops have been held to disseminate and collect information relevant to this study's plan formulation process. Both public meetings were publicized through the local media as well as through an extensive mailing list of Arizona citizens interested in flood control.

6)
Allenville residents prefer the relocation alternative and most residents have expressed a strong desire to relocate as a community. Those Allenville residents wishing to relocate elsewhere are free to do so.

JAMES H. GREEN, JR.
ATTORNEY AT LAW
11 LUHRS ARCADE
11 WEST JEFFERSON STREET
PHOENIX, ARIZONA 85003
TELEPHONE 252-5788

April 15, 1980

Mr. Neil Erwin
Allenville Project Manager
U. S. Army Corps of Engineers
2721 North Central
Phoenix, Arizona 85004

Dear Mr. Erwin:

In your telephone call to me of April 11, 1980, you indicated that my letter to you of April 7, 1980 would be included in the final report on the Allenville project and you advised me that any additional material presented to you on or before Tuesday, April 15 would also be included in the final report. For that purpose, I am enclosing herewith an article from the Buckeye Valley News of April 10, 1980 which is based upon the hearing you held there on April 2, 1980. The article is headed "Government Pushes Allenville Plans Despite Opposition," and it contains a very comprehensive report of the views presented at the meeting. I am also enclosing, as a further supplement to my letter of April 7, 1980, the Editorial from the April 10 edition of the Buckeye Valley News on this subject. I believe that the article and the Editorial must be included in your final report in order for the views, comments, and attitudes of the community to be fully and accurately set forth.

A meeting of the Buckeye-Harquahala Area Plan Citizens Planning Committee will be held on April 23, 1980 at 7:00 p.m. at the Buckeye Union High School to enable the Committee to hear and consider the views of interested persons who may wish to express their views to the Committee on the proposed relocation of Allenville. The Committee may then express its views to the Maricopa County Planning and Zoning Commission, which is scheduled

to consider an application on the Allenville matter on May 1, 1980. I believe it would be appropriate for you to be present at the meeting on April 23 and to be prepared to make a statement and to answer questions concerning the proposed project.

Very truly yours,

James H. Green, Jr., Chairman
Buckeye-Harquahala Area Plan
Citizens Planning Committee

JHG/mj
Encls.

Government Pushes Allenville Plans Despite Opposition

There was no question that the people from Allenville need relief and protection from continual flooding as outlined at the public meeting conducted by the Army Corps of Engineers here a week ago Wednesday night. Everyone present agreed that those folks had to be helped.

But what a number of area residents didn't like, and what they plainly stated, was the way that the various government agencies involved in relocation efforts were pushing a new community into a prime farming area, and putting one group of people along the river ahead of others who experienced a similar plight.

Col. Gross of the Corps set down the rules at the beginning of the three-hour long session by stating that the meeting would be devoted exclusively to the Allenville problem. A future meeting would be held to hear testimony of others affected by the flooding Gila River.

Thus a number of Rainbow Valley residents in attendance, along with others who suffered damage from repeated flooding, were shut off from the debate. This might have been expected because the Corps had previously made it clear that the meeting here was called to discuss the Allenville situation and only this topic would be considered.

However, there were also a number of Palo Verde residents and farmers present who objected to the relocation of the Allenville community to the area of Palo Verde Road and I-10. Perhaps their objections were best summed up by Elva Emmons, president of the Arizona Agri-Business Women's Assn., who listed numerous reasons why a residential area should not be allowed in the midst of farming ground.

Among other things she cited the "danger" from chemical spraying of nearby farm fields as evidenced by growing public concern near larger cities. She pointed out that it could be difficult for the Allenville Day Care Center to obtain a license in such an area. She noted that the people could very well be affected by the dust and pollens in the fields. Low flying ag planes and planes from the airport immediately across the road could cause disturbances and be a cause for complaints from residents. She cited dangers of city youngsters living near canals and farm equipment.

Mrs. Emmons noted that she does not appreciate the fact that a tavern may be rebuilt at the new site. She warned that the future growth of the community could cause many problems in the farming area just by virtue of the fact that more people bring more complaints. She questioned the quality of the drinking water and whether there would be enough of it in light of current groundwater rules and regulations being developed.

Ila Parker questioned how Palo Verde School was going to handle the influx of more youngsters. School Superintendent Tommie Townzen stated that long ago he had requested the results of studies performed by the Corps which should have covered the impact to the school. He said that in spite of written requests, he has received no information and therefore could make no future plans.

Wilford Hayden cited the family experience in Scottsdale when people crowded out the farms forcing many farm families to move elsewhere. He indicated that the same thing is likely to happen here.

Lola Johnson said that she is opposed to relocation because channelization is the only answer to the problem. "I feel that relocation is unfair to others along the river . . .especially the people of Rainbow Valley and Arlington who have suffered problems."

Rick Saylor questioned the land exchange whereby Allenville property owners will be able to trade their property along the river for state-owned property near Palo Verde Road and I-10. He was informed by a state official that a new law had to be passed to enable this transaction to take place, but it was now all legal.

Following the meeting that same state official told this newspaper that the transaction in fact is not complete and still must be approved by state officials following a hearing. He admitted that the Corps had based its studies and plans on a piece of land which still could be rejected for the land exchange. However, he made it clear that neither the state agencies nor the Corps felt that there would be any problem in this regard.

When he was then asked what was the point of public hearings prior to which the entire issue seemed already settled and assured, he threw up his hands and replied, "I don't know!" (See Editorial)

Clyde Cobbin of Allenville responded to those who spoke against the relocation of Allenville into a farming area. He noted that he had lived on or around farming land all of his life.

"We have been getting

CONTINUED ON PAGE 14

Government Pushing Through Allenville Plans

CONTINUED FROM PAGE 1

(chemical) spray all of our lives. It has not harmed any of us. We are used to these things," he stated.

He further cited the fact that in old Allenville near the river there were more dangers present, the water was bad, and he indicated that conditions could not get much worse. He said that Allenville residents were taxpayers too.

"We are asking the government to help us help ourselves," Clyde proclaimed. "We can live with (future) problems."

He concluded by stating that he and the people of Allenville would continue to support channelization of the Gila River. In fact, most every Allenville resident who spoke affirmed that same feeling.

Abe Harris noted that many concerns came out at the meeting. But he said that the real issue was that others "basically don't want to see Allenville located at Palo Verde Road and I-10."

He warned that, "either people learn to live together or they will end up dying while fighting like fools with one another."

Abe said that when the people of Allenville were trying to decide what to do about their problem, they consulted local businessmen and community leaders in Buckeye. "They said it would be wise to get out of the riverbed," Abe related.

Clyde and Abe and others then began contacting county and state officials, held meeting after meeting, refused to give up, and finally worked out the agreement for relocation.

"We need to put our efforts together to accomplish channelization," Abe continued, "but not at the sacrifice of Allenville."

Ella Mae Herring noted that folks in Palo Verde can make room for Allenville residents. She said that out of 41 families in the new community there would only be about six youngsters who would attend the Palo Verde School.

Chet McNabb summed it up for area residents by saying, "We still have the same problems with the river. We hope that the Corps can speed up its study to channel the river. While the problems are being alleviated for Allenville, most of the Valley is still suffering."

Rev. McGowen of Allenville said that she is happy to have people in this country who care for the poor. She said that she is happy that the government and the people gave her and her community another place to live. She concluded, "I love Allenville, and I am thankful that we do have love for everybody."

Col. Gross of the Corps of Engineers noted that the federal government is not involved in finding a solution for access into Rainbow Valley and suggested that the residents contact the county. He said that the Corps is making progress on its massive study of the river from the dams to the east to Gillespie Dam to the southwest.

He said that such a big study takes time. He said that a relatively small project such as the relocation of Allenville can be undertaken rather quickly because the funding is relatively small. The relocation is expected to cost $3.7 million (which someone later worked out to represent $92,5000 per family.)

While the results of the meeting last week will be included in a report by the Corps which will soon be forwarded to Washington, D.C. for final approval, most people present at the public hearing last week came away with the feeling that such hearings are useless since the outcome has already been determined. And many marveled at how the government can so easily circumvent its own rules and regulations when pressed to do so.

Some Allenville residents indicated that a Black vs White issue was the heart of the matter. But most others seemed more concerned with equal treatment for all than to deny Allenville a solution to its problem.

Nevertheless, according to the Corps, work will be started on the new community this fall and people should be moving into homes by the summer of next year. Any opposition to the concept that developed at the public meeting last Wednesday night will most certainly be overlooked. It appears that Allenville will get its new community right where residents asked for it.

EDITORIAL

MARK MY WORD...

By Mark Shepard

While some Allenville residents attending the public hearing concerning the relocation of that community seemed to regard opposition to the move as a Black vs White issue here last week, I didn't get that feeling at all. I came away with the feeling that other area residents really wanted the people of Allenville relieved of their burden of continually being flooded out by the Gila River.

But I also came away with the impression that these same area residents were simply trying to demand fairness for all concerned. Those who opposed the Allenville relocation to the area of Palo Verde Road and I-10 were concerned about the impact that a new community (any community) would have upon their way of life.

This is a just concern, especially in light of new government rules and regulations which are striking at the farming community. Allenville residents made it clear that upon moving into the midst of fields they wouldn't complain about pesticides. They wouldn't complain about airplane or machinery noise. They would not object to being disturbed at various hours of the day or night by operations around them.

I believe that they were very sincere. As Clyde Cobbin stated, most of those folks had lived around farms and even in fields during various portions of their lives. They knew about farming. They could tolerate most any situation.

But the farming people had a good point too. Whether or not the people of Allenville will accept spraying or noise or other farm-associated inconveniences, it is very doubtful whether various government regulators will condone the idea. As sure as night follows day, the bureaucrats will get involved and impose new restrictions on the surrounding farmers simply because there is a residential area in the vicinity.

There is no reason to believe that Allenville will be an exception. Every residential area is being protected today whether or not there is a danger, or whether or not the residents are lodging complaints.

Of course the people of Allenville today are so eager to get out of the repeated flooding along the river that they will glady make any concession. I don't blame them. But it won't be long before new families move into the new community – families which come from cities – families which won't tolerate so-called "harmful" chemicals or loud noises. This is bound to happen.

The airport immediately across the road from the new Allenville belongs to the City of Buckeye. Now it is virtually out in the middle of nowhere. But Luke Air Force Base and the Goodyear Naval Air Base were also once in the middle of nowhere. Today residents have moved right up to the runways and scream about the noise. An airport is vital to a growing city. A residential area built across the road is cause for future concern. Reportedly the city has already been turned down for runway repaving funds because a residential area is to be located so nearby.

No one, to my knowledge, in the area of new Allenville has been able to find quality water which meets government standards. The Army Corps of Engineers indicates that water quality is covered in its study. However, it is extremely doubtful that the Corps has been able to locate a well site with a proven reserve of water which will meet government standards for any length of time to come. Some day that problem will have to be faced – and perhaps sooner than can be imagined. The people of Allenville today may accept it – but I don't believe that the government regulators will.

It must be recognized in future planning that the government is going to continue to encroach into our lives. Masses of people are going to be favored over isolated individuals, such as farmers, even if the long term result is starvation for everyone.

Like the people of Allenville who must look out for their own interests and attempt to solve their problems, so too must other people. And that is what I believe the opposition at the hearing was trying to tell the Army Corps of Engineers and the state at the meeting last week.

The opposition to the relocation move in general was not a racial thing in my opinion. One lady did say that the government was promoting segregation by the move of an entire Black community to its own area.

By previous government actions toward de-segregation, I must support that idea. The government forced integration upon the schools even when neither Blacks nor Whites wanted such a concept. Busing resulted, again which neither race desired.

Yet here is an arm of the same government leaping to relocate an entire Black community as an entity unto itself. That same government that has forced neighborhoods to open up housing to achieve racial balance suddenly decides that it is fitting and proper for an entire community of 41 families of the same race to relocate into their own separate community.

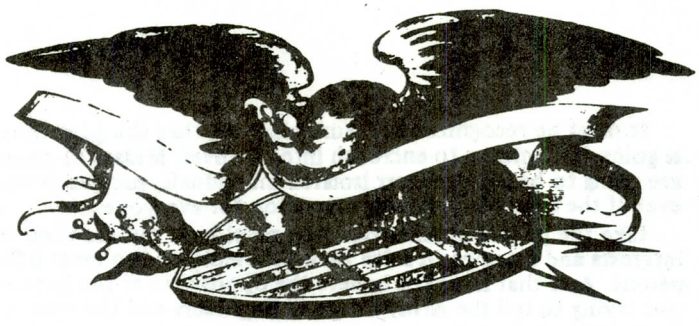
Even the Black community should be alarmed at this. The Corps may claim that this was decided to continue "unique community cohesion", but what will it say when a group of Whites wishes to establish its own separate community? And will the bureaucrats continue to overlook the implications when that comes about? Of course they won't. They haven't. Hundreds of white communities across the country have been forced to allow – and to even provide incentives – to people of other races in order to achieve some bureaucratic mandated balance.

I don't blame the folks of Allenville for wishing to stick together. But within the past dozen years the law of the land has dictated otherwise. How can the government suddenly make an exception?

This is a very valid question. The entire government attitude regarding the relocation move is suspect, to say the very least. Federal, state and county governmental agencies have seemingly ignored all recent precedent. They have combined to shove aside their own rules and regulations which would, and still do, affect and apply to other groups and individuals.

To me, this is the heart of the matter. And it should be the heart of the matter for Allenville people too. For this issue does not rest on racial tension. It directly confronts the laws of the land which have repeatedly been shoved down our collective throats.

Hopefully Abe and Clyde and the rest of the Allenville community will carefully examine these points. They are cause for thought and cause for concern for everyone regardless of race.



Valley Republicans

Post Office Box 25049
Phoenix, Arizona
85002

11 April 1980

Colonel Joe Gross
U.S. Army Corps of Engineers
2721 N. Central Ave.
Phoenix, Arizona

Dear Colonel Gross:

You are to be commended for your proposal to relocate Allenville. This expenditure of less than three million dollars should save taxpayers several times that amount over other efforts to protect this flooded community.

To follow this approach to its logical, and money saving, conclusion, we would suggest the following package of flood remidies in substitution for the exhorbitantly costly Orme Dam, now estimated at 340 million dollars:

1) Relocate Holley Acres (estimated at under five million);
2) Speed construction of the six large bridges accross the Salt, already planned by local enteties (twenty-five million);
3) Protect the airport with appropriate channelization and diking (about eight million);
4) Raise Roosevelt Dam six feet, in accordance with earlier Bureau of the Interior recommendations, for increased flood storage and to insure the safety of the downstream dams (eight million);
5) Encourage the Arizona Legislature to allow the Salt River Project to consider flood control in its opperation (no tax dollars).

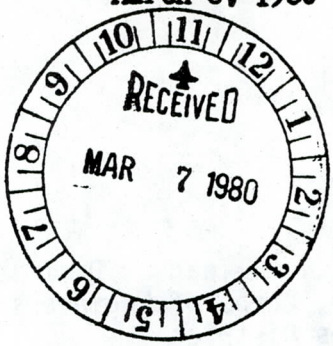
This package (including the reallocation of Allenville) should cost taxpayers under 50 million dollars, thus saving 290 million of the 340 million cost of Orme and would, in a number of ways, provide better flood control, more convenient cross-Salt transportation, and the opportunity for a park/flood plain similar to Scottsdale's Indian Bend Wash, greatly enhancing the economy and environment of the Phoenix area.

It would, finally, provide a local solution to a local problem, an approach consistent, we feel, with the desires and the independent philosophy of the Arizona citizen.

We thank you for your time and consideration.

Robert A. Croft
Chairman of the Board

Rainbow Valley Star Rt. 1 Box 711-D
Buckeye, Arizona 85326
March 6, 1980



Department of the Army
Los Angeles District Corps of Engineers
Phoenix Urban Study
2721 North Central Avenue, Suite 800
Phoenix, Arizona 85004

Att: Gwynn A. Teague

Concerning your letter received March1, 1980, Notice of Meeting April 2, 1980, at Buckeye Elementary School, I do hope you have some answers to problems other than Allenville in as much as the Allenville problem has been taken of while others remain.

I hope you have a solution for the people living all along the Gila River from where the Salt, Verde and Agua Fria rivers enter the Gila River.

The Gila River has become the cesspool of the whole state. Due to this the whole area has become a health hazard and will continue to be so for the future as poor maintenance is the rule not the exception.

We can stand so much and not more and as soon as it dries up it's like the house that leaks. It doesn't leak when it doesn't rain. Nothing will be done again this summer. Scientist have predicted four more years of this wet cycleand clearing the channel is a necessity this year.

The bridge that is planned for Rainbow Valley will be useless because they will not build one able to withstand the amount of water released by the dams.

Thanking you for you attention.

Sincerely,

Grace F. McMaster

Grace F. McMaster

Glynn (sic.) A. Teague, District Engineer
U. S. Army, Corps of Engineers
Los Angeles District
2721 N. Central Avenue Suite 800
Phoenix, Az. 85004

Dear Sir:

This is my public statement I would like entered into the record regarding the Allenville Flood Damage Reduction Study.

I will be unable to attend. Please add this to the comments you receive.

I support the Corps recommended solution; permanent relocation of the Allenville Community outside of the flood plain.

The Corp (sic.) is to be lauded for the recommended solution. It is, no doubt, the wisest and proper choice. It is not reasonable to spend hard earned tax dollars to try to support or sponser (sic.) and protect Allenville in the known flood plain of the Gila River.

Thank You
(signed)

Larry A. Forbio
6932 E. Portland St.
Scottsdale, Az. 85257

APPENDIX B

HYDROLOGY

PURPOSE AND SCOPE

The purpose of this appendix is to present currently available hydrology for Allenville, Arizona, a community along the Gila River located about 1.5 miles south of Buckeye, Arizona, 35 miles west of Phoenix, and 10 miles downstream of the confluence with the Salt River (see Plate 1).

The contents of this appendix, based upon preliminary results of Salt-Gila hydrology performed by the Los Angeles District, include a basin description, SPF results, discharge-frequency analysis, structures affecting magnitude and frequency of flooding, historical floods, and pertinent tables and plates.

GENERAL DRAINAGE AREA DESCRIPTION

The Gila River at Allenville drains approximately 42,000 square miles (effective area) in Arizona and parts of New Mexico and Old Mexico. The river rises in an area of high mountains and plateaus and flows westward in a generally central course through the Gila River Basin. The Gila River itself extends from the Continental Divide in southwestern New Mexico to the Colorado River at Yuma, Arizona, draining nearly all of southern Arizona, a widely varying region in topography and climatology.

The largest tributary, the Salt River, drains much of the northern part of the Gila Basin, joining the Gila River about 10 miles upstream of Allenville, Arizona, near Phoenix. The Salt River drains about 12,900 square miles (effective), an area extremely irregular and rugged with elevations commonly rising to 7,000 feet. The San Francisco Peaks in the Verde River drainage rise to more than 12,000 feet. The Verde River is the main tributary of the Salt River, including 6,300 square miles (effective) of the drainage area.

Other major tributaries are listed below with their drainage areas and respective location.

TRIBUTARY	EFFECTIVE DRAINAGE AREA (SQ. MILE)	LOCATION
San Francisco River	2,800	East Central Arizona
San Simon Wash	2,200	Southeastern Arizona
San Carlos River	1,000	Central Arizona
San Pedro River	4,500	Southeastern Arizona
Santa Cruz River	6,800	South Central Arizona

The southeastern portion of the Gila River Basin consists largely of long desert valleys lying between north-south ranges of rugged mountains; here the elevation, although rising in places to above 10,000 feet, is generally lower. The southwest portion of the basin consists essentially of broad, flat, low-lying desert valleys and isolated mountains of relatively low relief. Comparatively few localities are more than 4,000

feet in elevation, and most are below 1,000 feet. The elevation of the river mouth near Yuma is about 130 feet. Allenville is in the upstream part of this sub-basin. Soils and vegetative types vary widely throughout the basin.

The climate of the Gila River Basin as a whole is semiarid, but - depending principally upon elevation - ranges from hot and arid in some parts to cool and humid in others. The average annual precipitation ranges from less than 4 inches in the lower desert to 30 inches or more in the highest mountains. Most of the precipitation occurs in two distinct seasons, summer (July through September) and winter (December through March), and is about equally divided between them. Little rain falls during spring and autumn. During any season there may be many successive rainless days.

Summer precipitation may be placed in two general classifications. The first classification includes the sporadic showers and cloudbursts of small areal extent usually occurring from the insolational heating of tropical maritime air that frequently invades the region from the Gulf of Mexico or the Gulf of California and the South Pacific. The second classification includes the general rains that result from convergence, orographic lift, and frontal lift in situations where frontal systems with associated tropical maritime and polar continental or maritime air pass through the region. Thunderstorms may or may not be associated with general rains in this classification.

In winter, most precipitation results from general storms that are associated with extratropical cyclones of North Pacific origin. Relatively localized showers commonly occur near the end of such storms. Both the general winter and the general summer storms may result in rain over the entire Gila River Basin. On the average the general winter storms are longer in duration. They sometimes produce rain that is more or less continuous for several days. In winter, snow may accumulate to considerable depths at elevations above 4,000 feet but practically never falls at elevations below 2,000 feet.

SEASONAL OCCURRENCE OF FLOODING

Flow in the Gila River at Allenville usually results from above average runoff in the major upstream drainages, the Verde, Salt, and upper Gila Rivers, which spills from the upstream storage reservoirs. This type of flooding occurs most frequently as the result of severe winter storms (December through March), but may also result from melt of an unusually heavy snowpack in the North Central and East Central mountains (March through May). Less frequently and of much lesser import is flooding due to localized summer storms or late summer general storms. Table 1 gives a summary of some of the larger floods which have occurred in the basin.

TABLE B-1

HISTORIC FLOODS ON THE SALT AND GILA RIVERS

FLOOD PEAK (cfs)

DATE	SALT RIVER AT (1) GRANITE REEF DAM	GILA RIVER AT (2) GILLESPIE DAM
February 1891	300,000	250,000
April 1895	115,000	
January 19-20, 1916	120,000	230,000 (3)
January 29-30, 1916	105,000	155,000 (3)
February 1920	130,000	
March 1938	95,000	60,000
March 1941	40,000	45,800
December 1965 - January 1966	67,000	64,200
February 21 - May 29, 1973	22,000	18,000
March 1978	122,000	92,900
December 1978	140,000	122,000
January 1979	88,000	80,500
March 1979	67,800	
February 1980	180,000 (4)	

(1) Data published in "Draft Summary Report, Phoenix Urban Study, Final Report, September 1979," LAD, U.S. Army Corps of Engineers.

(2) U.S. Geological Survey Data, Water Supply Papers.

(3) Values are actually for Gila River at Yuma. Values for the Gillespie Dam were expected to be greater than this as indicated.

(4) U.S. Geological Survey Estimate.

STRUCTURES AFFECTING FLOODING AT ALLENVILLE

No major flood control structures affect flow in the Gila River at Allenville. The largest flood control structure, Tat Momolikot Dam, completed in July 1974, controls 1,780 sq. mi., and is located on Santa Rosa Wash, an upstream tributary of the Gila River. However, it has had little impact on flooding at Allenville.

The greatest amount of flood control at Allenville has inadvertently resulted from regulation of flows by large non-Federal water conservation reservoirs on the Salt, Verde, and Upper Gila Rivers. Although these reservoirs have no specified flood control storage, the space available can serve to mute and often prevent downstream flooding. Coolidge Dam on the Gila River controls 12,900 sq. mi. of watershed, and has not spilled any substantial amount of water since completion in 1928. Since construction of all six dams on the Salt and Verde Rivers, there have been significant spills from the Salt River Project Reservoirs in 1965, 1973, 1978, 1979, and 1980.

A table of significant water conservation reservoirs affecting flow in the Gila River at Allenville follows:

TABLE B-2

UPSTREAM STRUCTURES AFFECTING FLOODING AT ALLENVILLE

DAM	RIVER	YEAR COMPLETED	RESERVOIR CAPACITY (Ac-Ft)	EFFECTIVE DRAINAGE AREA (Sq. Mile)
Roosevelt	Salt	1911	1,381,580	5,830
Horse Mesa	Salt	1927	245,138	5,930
Mormon Flat	Salt	1926	57,852	6,090
Stewart Mtn.	Salt	1930	69,765	6,220
Horseshoe	Verde	1950	131,427	5,660
Bartlett	Verde	1939	178,186	5,850
Waddell	Agua Fria	1927	157,600	1,500
Coolidge	Gila	1928	1,065,800	12,900

STANDARD PROJECT FLOOD

The Standard Project Flood (SPF), based on a critical centering of the January 1916 storm, adjusted in the Verde River subareas using the March 1938 storm, is given in reference a. for the Gila River just below the confluence with the Salt (370,000 cfs) and at Gillespie Dam (350,000 cfs). The SPF peak for Allenville (360,000 cfs) was estimated by proration. This figure is expected to be within about 10 percent of the results of the Salt-Gila hydrology study.

DISCHARGE-FREQUENCY

No previous discharge-frequency relationships have been developed for the Allenville site, but reference b. contains a discharge-frequency curve for Painted Rock Dam inflows. Based on the relationship between SPF just below the confluence of the Salt and Gila Rivers and SPF at Painted Rock Dam, the Painted Rock frequency curve was adjusted to the Allenville site. The resulting discharge-frequency curve for Allenville, Arizona is presented in Plate 2, and a table of n-year discharges is given in Table 3.

TABLE B-3

DISCHARGE-FREQUENCY RESULTS FOR GILA RIVER AT ALLENVILLE

RETURN PERIOD	PEAK DISCHARGE, CFS
500-Year	330,000
200-Year	260,000
100-Year	215,000
50-Year	160,000
20-Year	100,000
10-Year	63,000
5-Year	31,000
2-Year	5,000

Values are taken from the Discharge-Frequency Curve for Allenville, Arizona (Plate 2, this report). These results are based on the Discharge-Frequency Curve for Painted Rock presented in reference b., and adjusted to the Allenville site as discussed in paragraph 7 of this appendix.

The results of the adopted curve for Allenville are similar to those in the Toups Flood Insurance Study (references c. d. and e.)and those in the Arizona Department of Transportation Report (reference f) for values exceeding the 0.05 probability flood.

The results of ongoing Salt-Gila hydrology study are expected to be about the same or a little higher than the adopted discharge-frequency values for Allenville for flows greater than or equal to the 20-year flood.

HYDRAULIC DESIGN

Since the entire Salt-Gila hydrology is not complete, the structural alternatives presented in this study are based upon the overflow boundaries provided for the Flood Insurance Study (reference c.). These discharges of 200,000 cfs and 320,000 cfs for the 100-year and SPF floods respectively are, if anything, below those expected for the given frequencies. A structural alternative designed on these data would have a smaller cost and therefore a larger benefit to cost ratio. Structural alternatives designed for this study proved to be not economically justified. Had either of these alternatives been marginally justified, the updated hydrology and corresponding hydraulics would have had to be examined. Such an examination could only have increased the costs with little or no increase in benefits. It also would have corrected the anomaly of the SPF/100-year flood overflows and the smaller Q yet larger overflows of the recent historic events. There is an apparent discrepancy at Section 81.59 on Plate 3, where the recent historic overflow exceeded the SPF boundary.

The rectification of this variance would have resulted in an increase in the height of the levee several feet from station 10+00 to 55+00 and probably would have increased its length as well.

REFERENCES

a. Interim Report on Survey for Flood Control, Gila and Salt Rivers, Gillespie Dam to McDowell Dam Site, Arizona (with appendixes), Dec. 4, 1957. By: C. T. Newton, Colonel, Corps of Engineers, District Engineer, LAD.

b. Design Memorandum No. 2, Infiltration of Painted Rock Reservoir Releases for Gila River Improvement (Texas Hill to Gila Siphon), September 1970, U.S. Army Engineer District, LAD, Corps of Engineers.

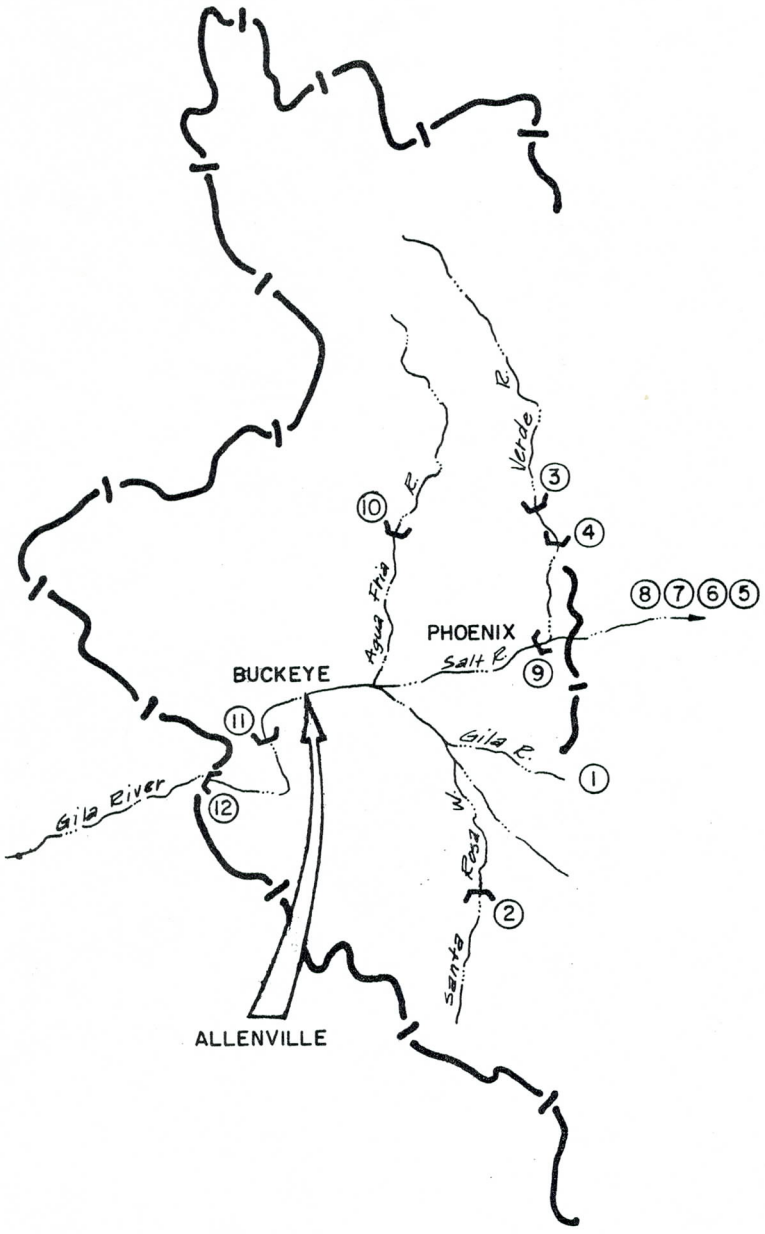
c. Flood Insurance Study, Gila River Flood Hydrology, September 13, 1976. Harris-Toups Associates, Phoenix, Arizona, draft report (updated January 10, 1977).

d. Written communiques, Corps of Engineers, LAD, to Harris-Toups Associates, September 1 and November 3, 1976.

e. Written communique, USGS, Tucson, Arizona to Harris-Toups Associates, November 22, 1976.

f. Methods for Estimating the Magnitude and Frequency of Floods in Arizona, Arizona Department of Transportation, Report No. ADOT-RS-15 (121) Final Report.

By: R. H. Roesek, USGS, Tucson, Arizona, September 1978.



NAME OF DAM

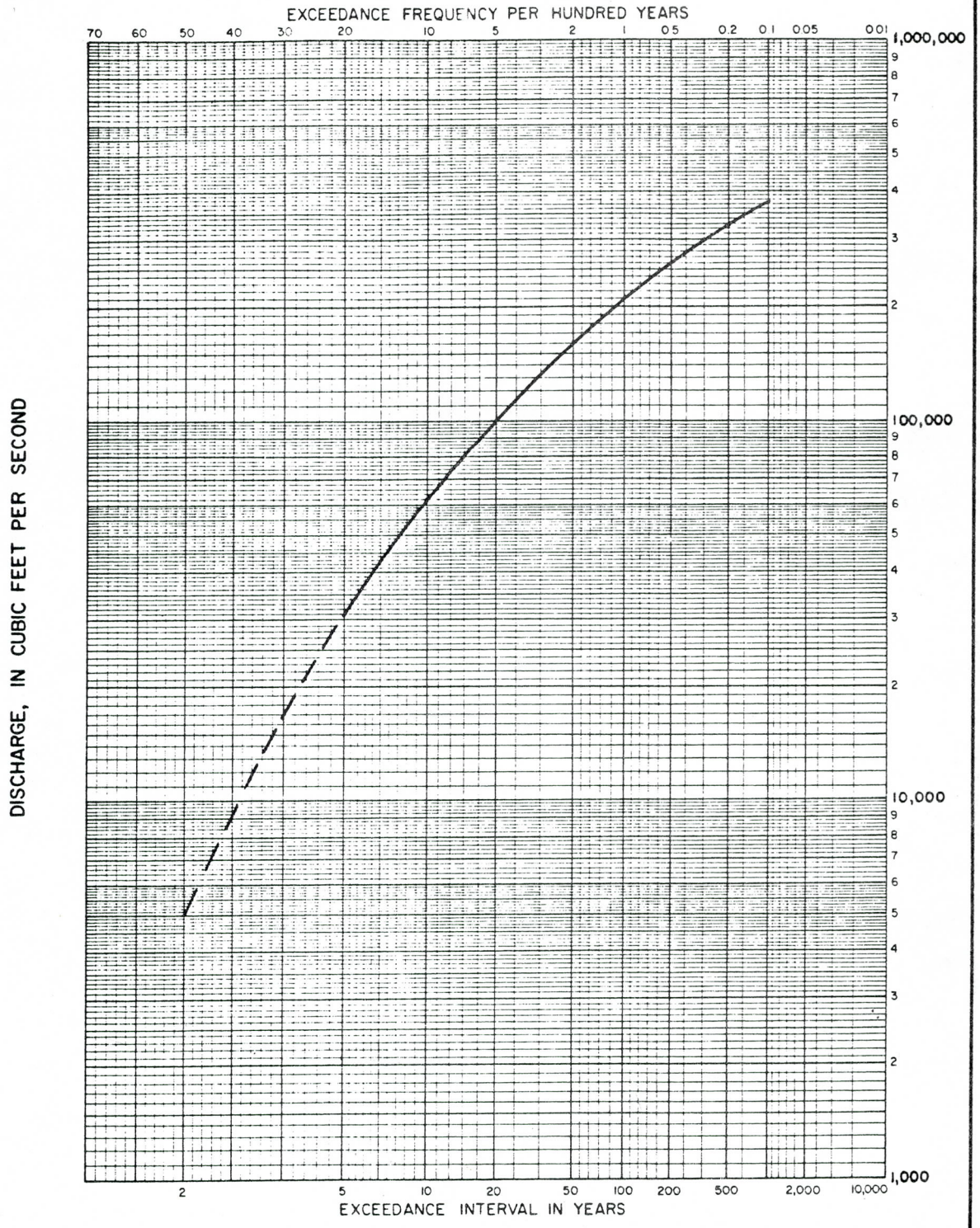
① COOLIDGE
② TAT MOMOLIKOT
③ HORSESHOE
④ BARTLETT
⑤ ROOSEVELT
⑥ HORSE MESA
⑦ MORMON FLAT
⑧ STEWART MOUNTAIN
⑨ GRANITE REEF
⑩ WADDELL
⑪ GILLESPIE
⑫ PAINTED ROCK

Drainage Area Boundary for Gila River above Painted Rock Dam

FLOOD DAMAGE REDUCTION STUDY ALLENVILLE, ARIZONA

GENERAL LOCATION MAP

U. S. ARMY ENGINEER DISTRICT
LOS ANGELES, CORPS OF ENGINEERS



FLOOD DAMAGE REDUCTION STUDY ALLENVILLE, ARIZONA

DISCHARGE-FREQUENCY CURVE

GILA RIVER AT ALLENVILLE

(Based on 1970 Painted Rock Curve)

DA = 42,000 SQ. MI.

U S ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

APPENDIX B PLATE 2

CITY OF BUCKEYE CORP LIMITS

SECTION 80.93

SECTION 81.15

SECTION 81.36

SECTION 81.59

HAZEN ROAD

MILLER ROAD

ALLENVILLE

Approximate SPF boundary
100 year flood boundary

Approximate ℄ SPF Levee

FLOODWAY

102+90
100+00
95+00
90+00
85+00
80+00
75+00
70+00
65+00
60+00
55+00
50+00
45+00
40+00
35+00
30+00
25+00
20+00
15+00
10+00

N

500 0 500
SCALE IN FEET

NOTE: 100YR & 500YR FLOOD BOUNDARIES FROM HARRIS-TOUPS ASSOCIATES FLOOD INSURANCE STUDY. (See Appendix B)

LEGEND

---- MARCH 1978 FLOOD
Approximate Q= 95,000 cfs

..... DECEMBER 1978 FLOOD
Approximate Q= 120,000 cfs

ALLENVILLE, ARIZONA

RECENT HISTORIC FLOOD OVERFLOWS

U. S. ARMY ENGINEER DISTRICT
LOS ANGELES
CORPS OF ENGINEERS

APPENDIX B PLATE 3

APPENDIX C

DESIGN AND COST

SELECTED PLAN DESCRIPTION

The selected plan calls for the permanent relocation of Allenville out of the Gila River floodplain, and the construction of a new community on land obtained from the Land Trust of the Arizona State Land Department. This 60-acre tract near the intersection of I-10 and Palo Verde Road is approximately eight miles northwest of Buckeye. Construction would begin in September 1980, with completion of the project in June 1981.

The State Division of Emergency Services has contracted an architect-engineer firm which has completed preliminary designs and cost estimates. The new community will consist of twenty single-family dwellings, ranging from one to four bedrooms on lots of either one acre or approximately one-third acre. The new homes are to be comparable to those now located in Allenville, but will meet HUD standards for safety, decency, and sanitation.

All homes are to be totally electric. An investigation was made into the possibility of using either natural gas or propane for the project, but natural gas was not available at the site, and operational expenses for all electric utilities were determined to be less than for propane. Local power and telephone companies have provided input into designs for utility service to the community.

Current designs also include facilities for twenty mobile home lots. The mobile homes are intended to serve as a means to allow renters from Allenville to remain with the community. These renters do not, for the most part, have the financial resources to obtain standard housing. The State Division of Emergency Services, therefore, intends to make the HUD obtained temporary housing units available on a sliding price scale (at a very nominal amount) to these displacees.

Also included in the relocation plan are a County park and a community center. Design of these facilities was based on replacement of features and square footage of existing items in Allenville. Locations for two churches, a Masonic Lodge hall, and a commercial concern are planned, but these structures will not be built by the Corps.

The following sections present discussions of the drainage, water quantity and quality, wastewater disposal, foundations and materials, as well as preliminary design and cost data for major features of the new community.

DRAINAGE

A flood insurance study was performed recently by the Corps of Engineers and Harris-Toups Associates on the relocation site. Based on this study and further on-site analysis, it has been determined that the proposed relocation site would not be subject to flooding in the event of a 100-year flood. Much of the flood flow in this region is unconfined and moves downslope from north to south as sheet flow. Sheet flow in this region is considerably less than one foot deep because the wide

expanse of flow prevents water from building up to greater depths, except in depressions and where water ponds behind dikes, canals, and road fills.

The site is located about 1,200 feet directly south of the Soil Conservation Service detention dike. This dike is about 20 feet above existing ground and is 16 miles long. It will prevent any flood flows from inundating the site from the north. Since the ground slopes toward the south in this area, water will pond on the north side of the dike during a flooding situation.

The design concept for drainage excludes offsite runoff from entering the proposed development. The location of the site immediately below the Soil Conservation Service detention dike results in a relatively small contributing offsite drainage area (70 acres) with a runoff rate of 165 cfs for the 100-year storm, all of which can be intercepted and carried in normal roadside drainage facilities.

Onsite drainage was analyzed by dividing the subdivision into eight discharge sub-areas and using the rational method. It is basically carried in the streets of the development and discharged to the south into existing drainage patterns. A retention basin with a minimum capacity of 202,000 cubic feet constructed in the park will retain the increased runoff as a result of the development (28 cfs), which would occur from a 100-year, two-hour storm. The runoff would then be discharged slowly after the storm is over.

Structures built on the site will be elevated at least one foot above adjacent ground or top of curb, whichever is higher, to account for local runoff. It is important that the site development also have a proper drainage system that can account for all local runoff. Finally, the site is to be developed in a manner such that proper access to Interstate 10 is provided in the event of an extreme flooding condition.

WATER SOURCES

Presently there is no potable water available directly to the Allenville relocation site. However, within the cultivated area east of the proposed development site, there are several irrigation wells, the closest of which is approximately 650 feet from the site's northeast corner. Water quality and quantity of this, as well as other irrigation wells, was tested in January 1979 by the Arizona Department of Health Services. These tests showed the well produces water which would meet the minimum standards for drinking. The water quality of the other wells tested deteriorated rapidly as their location moved south toward the Gila River. During heavy irrigation pumping it would be possible for the wells at the north end of the property to draw poor quality water from the south into their cone of influence.

The land on which these wells are located is leased from the State. The well equipment is owned and operated by the lessee and is set up for irrigation purposes.

Test results are included as Annex A to this appendix.

An existing well used for domestic water is located at the Buckeye Municipal Airport which is approximately one-half-mile south of the Allenville relocation site. The well was drilled during the establishment of the Luke Auxiliary Airfield and very little is known of its actual construction. Presently, it produces less than 20 gpm and serves the airport employees and visitors.

A sample of water from this well was tested by Arizona Testing Laboratory. The test results indicate that it would meet minimum drinking water standards.

There are two water companies with franchised areas in the vicinity of the Allenville relocation site, West Phoenix Water Company and Garcia Water Company.

The West Phoenix Water Company has a water franchise for Section 21, T1N, R4W, which is directly south of the Allenville site. A conversation with John Mihlik, manager of the water company, however, indicated that there is no developed water source or any service facilities in this area. The closest West Phoenix Water Company source of water supply is approximately three miles northwest of the Allenville relocation site. Utilization of this water supply would require the installation of approximately 16,000 feet of water main, including a bored crossing of Interstate 10. The preliminary estimated cost for this installation is $240,000.

The Garcia Water Company has a franchised water area approximately one and one-half miles north of the Allenville relocation site. Efforts to contact the Garcia Water Company have been unsuccessful. However, conversations with officials of the Maricopa County Health Department have indicated that the Garcia Water Company facilities are relatively small domestic wells serving a couple of developments in the franchise area.

Again, utilization of this water source would require the installation of approximately 8,000 feet of water main including a bored crossing of Interstate 10. The preliminary estimated cost for this installation is $180,000.

Conversation with Leroy Gates, Public Utilities Director for the Town of Buckeye, indicated that there has been some interest in the development of a portion of the airport property into an industrial park which would have water supplied by Buckeye. Mr. Gates, however, felt that such development is a minimum of three to four years away.

It is recommended therefore that a water supply system be developed on the Allenville relocation site. This plan has several advantages over the connection to or use of existing facilities. It would not require any offsite water main construction. All required facilities would be within the Allenville site. In addition, the well would be used basically for domestic uses. The pumping rates and water volume would be small compared to that required for irrigation and therefore the possibility of contamination with poorer quality waters would be greatly reduced.

The cost of this water supply system is substantially less than the possible extension of existing water mains. The installation of a new well and pump represents a cost increase over using the existing irrigation well as a water supply. However, it is felt that this cost increase is offset when viewed against water quality and the possible conflict in water usage.

The water supply system would be operated and maintained by a board of directors consisting of Allenville residents. The Allenville Water Company Inc. had similar responsibilities for the well and distribution system in the flood devastated community.

The cost of the well, including well pump, storage tank and other required equipment is estimated at $117,500. Plates C-3 and C-4 depict the system and Table C-1 details the costs.

WELL DESIGN

Presently, an adequate supply of good quality water is available at a depth of about 200 feet. However, it is proposed to drill the new well to a greater depth than existing wells in the area. Within the entire Salt River Valley, the water table has been steadily declining as a result of groundwater pumping. Although new laws and management practices are expected to slow the rate of depletion, extra depth is advisable to insure an adequate supply in the future. The actual depth of the well will be determined by a test hole sampling program, to insure that an adequate supply and quality of water can be obtained.

Cost estimates are based upon a 500-foot well. The estimated increase in the cost of the well would be up to $30,000 for an additional 500 feet. This cost is small compared to the cost of redrilling the well in 10 to 15 years.

SUPPLY AND STORAGE

The supply and storage system should consist of the following items:

1. Well with 100 gpm pump.
2. Float system.
3. 100,000-gallon storage reservoir.
4. 1,000-gallon hydropneumatic tank.
5. 250 gpm pump (fire flow).
6. Flow meters.

The water demand is based on a total of 55 lots. Based on five persons per lot and a consumption of 125 gallons per capita per day, the total deaily demand is:

125 x 5 x 55 = 34,375 gallons
Fire flow is 250 gallons per minute for two hours:
250 gal/min x 60 min/hr x 2 hr = 30,000 gallons

Therefore, the total storage required would be 64,375 gallons (34,375 + 30,000). We recommend a 100,000-gallon storage capacity to insure water supply, should the deep well pump need repairs. The 100,000 gallon capacity would contain a two-day supply, plus the required fire flow.

The normal supply is from the well to the tank, through the 60-gpm pump, and then into the hydropneumatic tank, to the distribution system. The 250 gpm pump is used only for fire flow. When the demand is greater than the hydropneumatic tank is capable of handling, the 250-gpm will be used to supply the system. The reason for the separate pump for the fire flow is that the hydropneumatic system will not handle the flow, and with the fire flow demand there is the possibility the system can be contaminated.

The well pump will be turned off and on by use of a two-ball float system. The lower float will turn the pump on when the water in the tank reaches a specified elevation. Before the water level gets to the overflow elevation, the upper float will be used to turn the pump off.

COST ESTIMATES

The following is a preliminary cost estimate for the well, tanks, pumps, piping, and other equipment. This estimate does not include the distribution system.

TABLE C-1

WATER SUPPLY SYSTEM COSTS

ITEM	DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
1.	Well	1	LS	$ 32,500
2.*	100,000-gallon storage tank	1	LS	40,000
3.	1,000-gallon hydro. tank	1	LS	1,200
4.	Gate valve	10	500 ea.	5,000
5.	Check valve	4	700 ea.	2,800
6.	250 gpm pump	1	3,000 ea.	3,000
7.	100 gpm pump (well)	1	10,000	10,000
8.	60 gpm pump	2	1,500 ea	3,000
9.	Piping	1	LS	20,000
			TOTAL CONSTRUCTION COST	$117,500

*75,000-gallon tank = $33,000

The difference in costs for a 100,000-gallon storage tank, compared to a 75,000 gallon storage tank, is approximately $7,000. Therefore, for the added protection, the 100,000-gallon storage tank should be constructed.

The inline pump system would cost approximately $2,000 more than the system with the hydropneumatic tank and the hydropneumatic tank has lower maintenance costs. The inline pump system, therefore, is not economical.

WASTEWATER DISPOSAL

Presently there are no existing public or private wastewater disposal facilities serving the area of the proposed development. Therefore, it will be necessary to provide a complete onsite wastewater disposal system to serve the development's needs.

The two possible methods of wastewater disposal include the individual sewage treatment and disposal system and a community sewage system including a collection system, central sewage treatment plant, and effluent disposal.

Individual Sewage Treatment Systems

The individual sewage treatment system would include a septic tank and a subsurface wastewater disposal field for each lot. The size of the septic tank and disposal field would be determined by the number of bedrooms in the residence served and by the percolation rate of the soil in which the system is to be constructed. Preliminary reports on the percolation rate at the proposed Allenville relocation site indicates a weighted average rate of 13 minutes per inch. The effluent application rate for this percolation rate, determined from the Maricopa County Health Code, Chapter II, Section 8, Regulation 13, is 1.30 gal. per square foot, or 190 square feet per bedroom. Therefore, the total absorption area required is as follows:

Two-bedroom residence	-	380 Sq. ft.
Three-bedroom residence	-	570 Sq. ft.
Four-bedroom residence	-	760 Sq. ft.

The minimum size of septic tank to be used for each system is as follows:

One three-bedroom residence	-	960 gal.
Four-bedroom residence	-	1,200 gal.

Community Sewage System

The community sewage system would collect and carry the development's wastewater to a central point for treatment and disposal. The anticipated site for the treatment plant and disposal pond is in the southeast corner of the development.

The collection system would consist of 8-in. sewer pipe with 4-in. service connections for each lot.

The treatment plant would have a capacity of 30,000 gallons and incorporate a lift station at the inlet. The effluent from the plant would be discharged into a holding pond approximately one acre in size and allowed to percolate and evaporate.

TABLE C-2

SEWAGE SYSTEM COST ESTIMATES

Individual Sewage Treatment:

55 Residential Lots	@ $2,000	=	$110,000
1 Community Center	@ 2,500	=	2,500
56 Connections	@ 100	=	5,600
	Total		$118,100

Community Sewage System:

Collection System

5,000 L.F. - 8" Pipe	@ $ 11	=	$ 55,000
16 Manholes	@ 1,000	=	16,000
60 4" Connections	@ 350	=	21,000

Treatment and Disposal

Lift Station		=	15,000
30,000-gal. Treatment Plant		=	45,000
1-acre Disposal Pond		=	5,000
	Total		$157,000

Summary

Comparison of the individual disposal system with a community system indicates several advantages for the individual system. Some of these advantages are: 1) no complex collection network, 2) no additional land use requirements, and 3) a considerable cost savings for the installation of the individual systems. The most significant advantage of the individual system, however, is in the area of operation and maintenance. The septic tank and subsurface disposal systems will function efficiently for years with little or no maintenance. Maintenance cost would be borne by the individual lot owners as needed. On the other hand, the community system will require a continuing operation and maintenance program to keep the plant and its appurtenances operating efficiently. Furthermore, costs for electric power to operate the plant and the necessary chemicals and major replacement parts will significantly increase operations cost of the community system. It is estimated that the cost for operation and maintenance of the community system would result in a monthly user charge of $ 20 - $25.

Based on this analysis individual septic tanks and subsurface disposal fields will be installed to provide wastewater disposal for each resident as well as social and commercial facilities.

FOUNDATION AND MATERIALS

Site Conditions

The site is essentially level and contains a moderate growth of creosote brush, other desert vegetation and paloverde trees. There are no deeply incised drainages on the site; runoff apparently takes the form of sheet flow in a southerly direction away from the White Tank Mountains. No evidence of prior construction or of manmade fill was observed on the site. The site has not been cultivated, as has property immediately to the east.

Subsurface Exploration

Fifteen exploratory borings were drilled to a depth of 16 feet below existing grade. Borings were advanced using a 6-5/8-inch diameter hollow-stem auger. Standard penetration testing was performed at selected intervals in the borings.

Laboratory Analysis

Moisture content determinations were made on selected tube samples recovered. The results of these tests are shown on the boring logs. Grain-size analysis and Atterberg Limits tests were performed on selected samples.

Soil Profile

As indicated by the exploratory borings, the subsoils may be described as a two-layer profile. From the surface to a depth of about 18 inches below existing grade, the soils are primarily silty sand of very low plasticity. These soils do not exhibit lime cementation and are generally soft. Exposures in backhoe trenches suggest that these surficial soils were deposited by sheet flow in the recent geologic past.

Beneath the surface layer is a well-developed profile of cemented desert alluvium. These subsoils consist primarily of silty and clayey sand with varying amounts of gravel. The soils are lime cemented to degrees varying from moderate to very strong and are mostly firm to hard in their condition of low density.

Soil Moisture & Groundwater Conditions

No free groundwater was encountered in the borings. Soil moisture contents were very low throughout.

Analysis of Results

The near surface soils at the site are soft and moisture sensitive and are not considered suitable for foundation support even if very low bearing pressures were used. Cemented soils below about 18 inches are firm and will provide excellent support for shallow spread-type foundations, provided careful site drainage and moisture protection measures are utilized to prevent saturation of subsoils beneath footings.

Shallow Spread-Type Footings

Vertical Loads

Recommendations given in this section apply to footings bearing on native soils at least 18 inches below existing grade. Should final grading plans involve raising of finished floor a significant height above existing grade, two options are available. Conventional spread-type footings utilizing deeper stem walls may be used so that the base of footings is in contact with the firmer soils. As an alternative, the soft surficial soils may be overexcavated to a depth of 18.0 inches below existing grade and recompacted.

A safe soil bearing pressure of 1,500 psf is recommended for footings designed in the above manner. This value applies to both dead plus live loads and may be safely increased by one-third for total loads including wind or seismic forces. Minimum recommended depth of footings is 1.5 feet below lowest adjacent finished grade.

Two feet and 1.33 feet are the minimum recommended widths of square and continuous footings, respectively.

Lateral Loads

Passive soil resistance against edges of footings, stem walls, etc., with properly compacted backfill should be considered as being equal to the forces exerted by a fluid of 350 pounds per cubic foot unit weight. A coefficient of friction of 0.40 is recommended for computing lateral resistance between the bases of footings and slabs and the soil in analyzing lateral loads.

Estimated Settlements

It is estimated that settlements of footings and slabs designed in accordance with the above recommendations will not exceed one-half inch for the soil moisture contents encountered in the native soils during test drilling, or compaction moisture contents in the case of fills. It is expected that, in most cases, settlements for these moisture contents will be less than one-quarter inch. Moisture increases in the supporting soils would increase settlements somewhat.

Site Grading

All vegetation and debris should be removed from areas where buildings, exterior slabs, or pavements are to be placed. Where additional fill is required, the upper six inches of native soil to receive fill as well as the upper six inches of cut surfaces, should be scarified, brought to within 2 percent of optimum moisture content and compacted to at least 95 percent of maximum dry density as determined by ASTM D698.

Structural Fill

All fill required to bring the site up to subgrade elevation should be free of vegetation, debris, and other deleterious material, and should contain no particles larger than six inches in diameter.

The plasticity index of the fraction passing the no. 40 sieve as determined by ASTM D423 and D424 should not exceed 15. It appears that nearly all of the surficial soils at the site meet this criterion.

All structural fill for footing and slab support, including backfill, should be compacted to within 2 percent of optimum moisture content and to at least 95 percent of maximum dry density as determined by ASTM D698.

Granular Base

Granular base, where used, should meet the following grading requirements as determined by ASTM D422.

Sieve Size (Square Openings)	Percent Passing by Weight
1-1/8 inch	100
1/4 inch	38-70
no. 200	0-12

The plasticity index of the material passing the no. 40 sieve should be no more than 5 when tested by ASTM D423 and D424. The coarse aggregate should have a percent of wear, when subjected to the Los Angeles abrasion test (ASTM C131), no greater than 45.

All granular base should be compacted to at least 95 percent of maximum dry density as determined by ASTM D698.

Slab Support

Where structural fill is maintained at or below the compaction moisture content it will afford as firm or firmer slab support as would be provided with the granular base course. Thus, the use of granular base is not necessary for structural support of slabs. However, granular base may provide a more desirable working surface, minimizing capillary rise of moisture to slabs and aid in the proper curing of concrete. If its use is designed for these purposes, a four-inch course of material meeting the requirements given above is recommended.

Moisture Protection of Slabs

Granular base would tend to act as a capillary barrier to moisture, but would not provide a positive barrier against the rise of moisture to slabs. If the moisture sensitivity of floor coverings is considered critical, an impervious membrane vapor barrier should be placed beneath the floor slabs.

Percolating Testing

In order to provide criteria for the design of individual sewage disposal systems, nine in-site percolation tests were performed according to criteria outlined in Arizona Department of Health Services Engineering Bulletin No. 12 (May 1976).

A tabular listing of the percolation test values is included in Table C-3. Locations of the test pits and test boring locations are shown on the site plan, Figure C-1.

TABLE C-3

RESULTS OF PERCOLATION TESTING

Test Pit No.	Steady State Percolation Rate (minutes/inch)
1	13
2	13
3	12
4	6
5	5
6	9
7	4
8	13
9	14

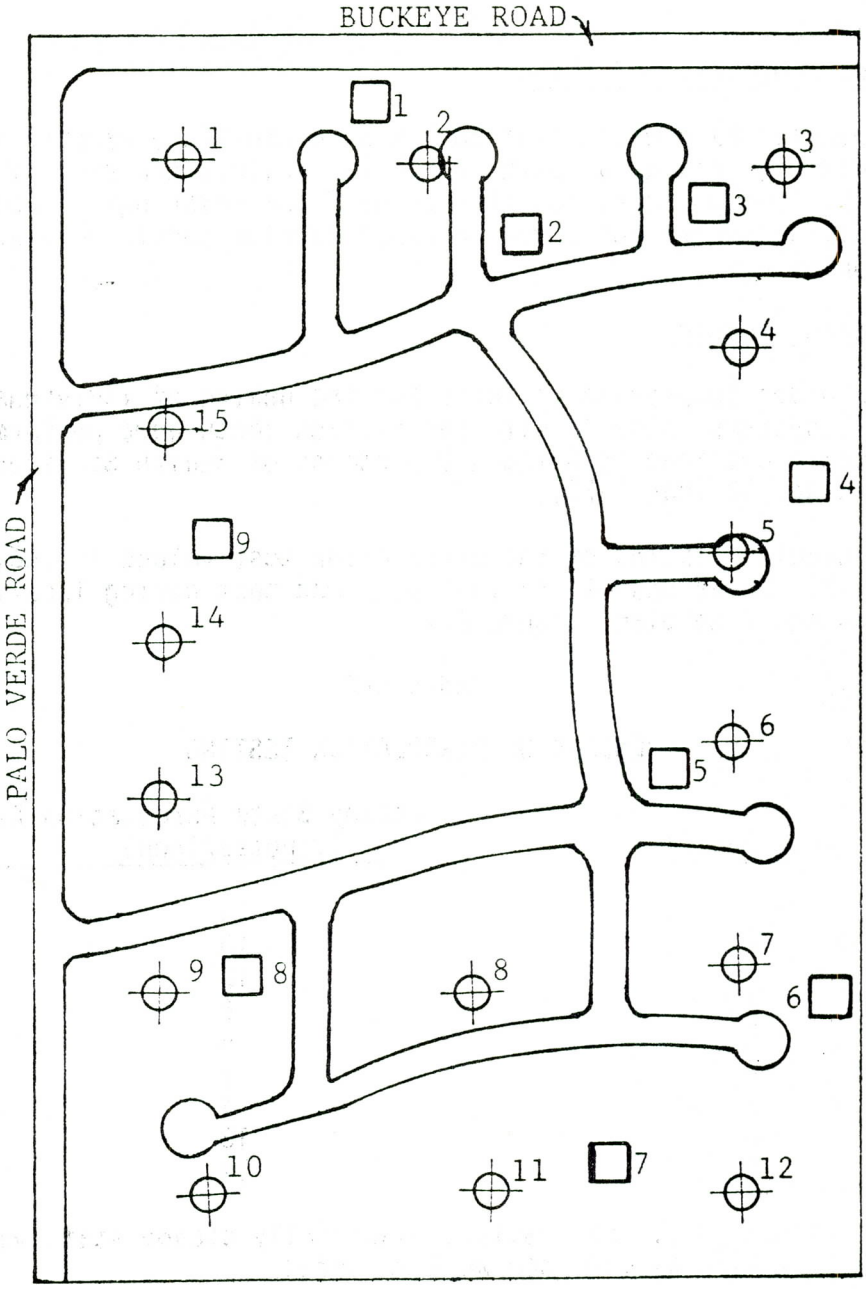
As indicated by the results, essentially steady state values ranging from 4 to 14 minutes per inch were recorded.

Pavements

Pavement Design Analysis

Pavement design analysis was made for the on-site paving based on grain-size analysis and Atterberg Limits test data, as well as current Arizona Department of Transportation structural number methods, which have been sanctioned for use by municipalities belonging to the Maricopa Association of Governments.

Recommendations for conventional asphaltic concrete over granular base and full thickness asphaltic concrete design are given below. All recommended pavement sections are contingent upon the application of a seal coat to the finished surface of the asphaltic concrete and a minimum thickness of eight inches of compacted subgrade.



LOCATION OF TEST BORINGS AND PITS

FIGURE C I

The following conventional asphaltic concrete over granular base pavement structure is recommended:

Area	Asphaltic Concrete	Granular Base
Passenger Car parking and traffic lanes	2 inches	4 inches

Full Thickness Asphaltic Concrete

The following full thickness asphaltic concrete section is recommended:

Area	Asphaltic Concrete
Passenger car parking	3 inches

Materials Quality & Construction Requirements

Materials quality and construction requirements should conform to the following sections of "Arizona Highway Department Standard Specifications for Road and Bridge Construction" adopted by the Arizona Department of Transportation in February 1974.

Item	Section(s)
Untreated Base	302 & 702(B)
Bituminous Prime Coat	402
Chip Seal Coat (Type I)	404 & 704
Asphaltic Concrete	406 & 703

Asphaltic Concrete

A type MA-3 mineral aggregate or approved alternate should be utilized. The job mix formula will be established using the Marshall Method of mix design, with the stability and flow being determined by ASTM D1559. The following criteria should be used in the mix design:

Number of blows on each end of specimen - 75
Stability, pounds - 1,800 minimum
Flow, units of 0.01 inch - 8 to 18 percent
Percent air voids - 3 to 5
Percent voids in mineral aggregate - 14 minimum.

ANNEX A

WATER QUALITY TEST RESULTS

On January 24, 1979, personnel of the Water Rights Division of the Arizona State Land Department conducted discharge-drawdown tests and collected water samples from selected wells located near the Allenville relocation Site (Parcel MA 6-6). In combination with this field investigation, the files of the Arizona State Land Department and the United States Geological Survey were examined for additional information pertaining to the wells and groundwater conditions of Parcel MA 6-6. Also, historic pump test records and chemical analyses were supplied by W. T. Gladden of Gladden Farms, the lessee of the parcel. Observations concerning the wells and groundwater conditions of the parcel are summarized below:

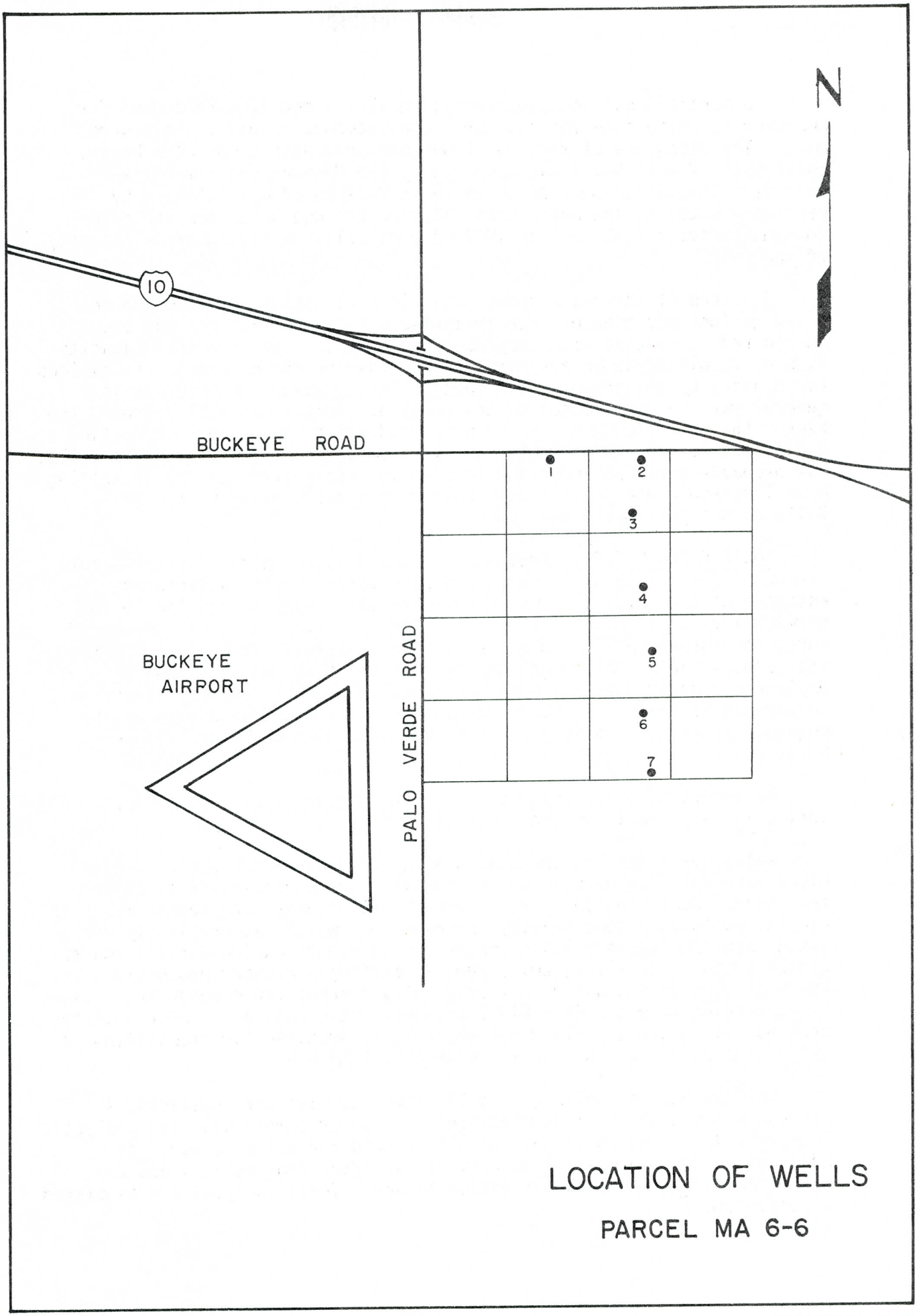
WATER TABLE: Prior to conducting the discharge test the depth to water in each of the seven wells within the parcel was measured. The static water level measurements define a water table that is essentially flat, the only deviation being a slight rise in elevation of the water table at Well No. 1 in the northwest corner. Depth to groundwater ranged from 199 feet in Well No. 2 at the northern end of the parcel to 156 feet in Well No. 7 at the southern end.

The lack of significant gradient in the water table implies very slow groundwater velocities, and hence very little natural movement of groundwater into or out of the parcel. In other words, natural recharge to the parcel is relatively minor. In this type of situation, groundwater movement is induced mainly by the establishment of cones of depression around pumping wells.

WELL DISCHARGES, DRAWDOWNS, AND SPECIFIC CAPACITIES: The following are the most recent discharge, drawdown and specific capacity figures available for the seven wells:

Well	Date of Measurement	Discharge (gallons/min)	Drawdown (ft.)	Specific Capacity (gpm/.ft)	Source of Information
1	1-24-79	440	88.6	5.0	ASLD Test
2	5- -78	125(E)	-	-	Arizona Engine & Pump Company
3	4-15-76	1000(E)	120	8.3	ASLD files
4	5-16-78	1120	-	-	AEP
5	5-16-78	848	145	5.9	AEP
6	2-77	1000	120	8.3	ASLD files
7	1-24-79	780	130	6.0	ASLD Test

(E) - Estimated



LOCATION OF WELLS

PARCEL MA 6-6

FIGURE C 2

The northernmost and southernmost wells, 1 and 7, were pumped for one hour at which time the discharge measurements recorded above were made. The discharge of Well No. 1 was measured with a Cox Flow Meter, while that of Well No. 7 was computed by the Manning and time-flow methods. The measurement of drawdown in Well No. 7 was deterred by cascading water in the well, necessitating the use of an earlier drawdown measurement (130 feet in 1977) for calculating the specific capacity of the well.

A glance at the table shows that the wells discharge from 125 to 1,120 gallons per minute. For irrigation, these productions can be considered as ranging from very poor to moderate. The specifiy capacity figures tabulated above are obtained by dividing the discharge (in gallons per minute) by the drawdown (in feet). This paramenter expresses in a general way the performance of the combined aquifer and well system - the higher the specific capacity, the more productive the system. Specific capacities for the seven wells rank low compared to most irrigation wells, but probably could be increased in a newly-constructed well by installing a well screen and a gravel pack, rather than perforating with a Mills Knife as has previously been done.

AQUIFER PARAMETERS: From the limited drawdown data collected from the pumping wells (Nos. 1 and 7) and neighboring wells, a tentative estimate of transmissivity was made. Transmissivity is related to the permeability of an aquifer - that is, the ease with which groundwater moves through the aquifer materials. The transmissivity calculated for this area is about 15,000 gallons per day per foot, which agrees with empirically derived values based on specific capacities. This figure is comparable to transmissivities found in similar lands located near the mountain front, but is very low when compared with basinward transmissivities.

As expected, the storage coefficient obtained over such a short period is very small, on the order of 10^{-4}.

WATER QUALITY: The chemical quality of groundwater beneath Gila River land has long been known to improve with increasing distance from the river. Away from the river, near the relatively impermeable mountain blocks, wells pump good quality groundwater, which had originally percolated into the coarse alluvial materials as runoff during intense storms. Closer to the Gila River, wells pump increasingly greater proportions of the much more saline water that originally reached the groundwater system by recharging into the Gila River channel. This change in water quality, from mountain front to Gila River channel, is dramatically exemplified in water samples taken from the wells of Parcel MA 6-6.

For the pumping wells (1 and 7), water samples were collected 10, 20, and 60 minutes after pumping began. A water sample was also collected from Well No. 5, which is periodically pumped for domestic use. In addition, Mr. Gladden supplied chemical analyses from Wells 1 and 2, collected during the 1973 irrigation season. These analyses are tabulated at Inclosure 1.

SUMMARY OF CHEMICAL ANALYSES OF PARCEL MA 6-6 WELLS

INCLOSURE 1

Well No.	Location	Date	Time Sampled	Time Since Pumping Began (min)	Specific Conductance (umhos/cm)	Residue (TDS)	pH	Hardness (as CaCo3)	Calcium	Magnesium	Sodium	Iron	Carbonate	Bicarbonate	Chloride	Nitrate	Sulphate	Fluoride	Chromium	Arsenic
											64	0.05	0	144	65	8	88	0.66	0.01	<0.01
1	B(1-4) 16 baa	6/1/73	1550	---	555	358	8.3	166	46	12										
											46	2.27	0	129	13	7	42	0.86	0.01	<0.005
		1/24/79	1137	5	345	158	---	52	16	5										
		1/24/79	1202	30	(Incorrect analysis - lab error)						46	0.05	0	137	14	8	35	0.89	0.01	0.007
		1/24/79	1232	60	400	182	7.9	50	17	5	55	0.01	0	139	14	9.9	41	0.8	0.01	<0.01
		**1/24/79	1232	60	410	230	7.8	52	13	4.7	50.6	0.01	-	---	13.2	---	20	---	0.01	----
2	B(1-4) 16 aba	7/30/73	----	---	---	176	7.8	60	17	4.3	158	0.2	0	88	444	58.5	195	0.6	0.01	<0.01
5	B(1-4) 16 dba	**1/24/79	1100	---	1960	1140	7.6	600	148	56	750	7.8	0	144	1040	150	2050	0.70	0.01	0.27
7	B(1-4) 16 dcd	1/24/79	0953	5	6100	4558	7.5	1940	464	200										
		1/24/79	1023	30	(Incorrect analysis - lab error)						740	1.57	0	141	1100	152	1900	0.73	0.01	0.026
		1/24/79	1053	60	---	4622	7.3	1950	472	180	770	0.9	0	146	1140	157.5	2050	0.6	0.01	<0.01
		1/24/79	1053	60	7100	4800	7.4	2010	460	209										

* Alkalinity assumed to be caused only by carbonate and bicarbonate. Computed from phenothalein and methyl purple endpoints.

** Analysis by Arizona Testing Lab. All other analyses by Department of Health Services.

NOTES: 1. Concentrations of copper, manganese, zinc, arsenic, silver, cadmium, lead, selenium, mercury, and barium are below detection limits.

2. All constituent concentrations are in milligrams per liter.

Well No. 1, the furthest from the Gila River, pumps water very suitable for domestic use. The only objectionable characteristic is that the water is classified as "hard," but this is typical of groundwater pumped from alluvial basins in the Southwest. Well No. 5, located south of Well No. 1 and slightly closer to the Gila River, shows a threefold increase in Total Dissolved Solids compared to Well No. 1, and a nitrate concentration that exceeds the rejection limit for a domestic supply under the state drinking water standards. Well No. 7, the most southerly of the Parcel MA 6-6 wells, contains more than 13 times the dissolved solids of Well No. 1, with concentrations of chloride, nitrate, and sulphate greater than limits specified for domestic use. No excess concentrations of fluoride or trace metals were measured in any of these samples.

The samples taken during the 1973 pumping season are significant because they indicate that after a period of continuous pumping, even Wells 1 and 2 will begin to draw water having some characteristics of the saline water to the south. It is suggested that during the pumping season, after the cones of depression of Wells 1 and 2 move out far enough and stablilize, the saline groundwater to the south begins to move northward downgradient into the cones of depression, eventually reaching the well and mixing with water from the reservoir of good quality water surrounding the well. If one of the northern wells is to be used for domestic use, it follows that irrigation pumpage at this end should not be of such magnitude as to draw in excessive quantities of the poorer quality groundwater to the south.

As a final note, calculation of the Calcium Carbonate Saturation Index for the samples indicates that there should be no tendency for scaling and calcium carbonate deposition in the well and delivery pipes.

ALLENVILLE COMMUNITY DEVELOPMENT

COST SUMMARY

Building Costs	
Housing 1 Br (3)	$103,800
2 Br (5)	192,000
3 Br (5)	229,500
4 Br (6)	327,000
Community Building	216,000
Park	
Landscaping	206,300
Ramadas	40,000
Total Buildings and Park	$1,316,000
Total Site and Utilities	$1,146,000
Sub Total	$2,462,000
Contingencies (10%)	$246,000
Supervision and Administration (5%)	$135,000
TOTAL	$2,843,000

BASIS FOR COST ESTIMATES

The detailed estimate of first cost is given in the attached data. The prices shown are those expected from a prudent contractor bidding the work in July 1980, and are based on a 240-day construction schedule. Prices for site and utility work were obtained from recent (December 1979) contractor conditions on a similar subdivision project in Maricopa County and on supportive data from several area contractors. Prices on building construction are based on a similar 50-unit housing project for Whiteriver, Arizona bid November 1979 and on quotes from various suppliers, particularly for such items of equipment as are included for the park. Community building estimates were also supplemented by actual bid data from a recent similar project at Ft. McDowell, Arizona. Prices take into consideration the ready availability of asphalt and concrete materials at Avondale (Agua Fria River), approximately 20 miles away.

CONSTRUCTION COST ESTIMATE	DATE PREPARED	SHEET 1 OF 42

PROJECT: ALLENVILLE COMMUNITY DEVELOPMENT

LOCATION: ALLENVILLE, ARIZONA

ARCHITECT ENGINEER: NUMKENA ASSOCIATES

BASIS FOR ESTIMATE
- ☐ CODE A (No design completed)
- ☐ CODE B (Preliminary design)
- ☒ CODE C (Final design)
- ☐ OTHER (Specify)

DRAWING NO.

ESTIMATOR: DEREMIAH

CHECKED BY

SUMMARY	QUANTITY NO. UNITS	QUANTITY UNIT MEAS.	LABOR PER UNIT	LABOR TOTAL	MATERIAL PER UNIT	MATERIAL TOTAL	TOTAL COST
HOUSING - 1 BEDROOM UNIT - PLAN A							
1. EARTHWORK							
a. Machine Excavation	10	CY	5.00	50.00	12.00	120.00	170.00
b. Hand Excavation	1	CY	28.75	28.75	-		28.75
c. Backfill	10	CY	6.50	65.00	5.00	50.00	115.00
d. Cap. Water Barrier	13	CY	11.00	143.00	12.00	156.00	299.00
e. Fine Grade	10,000	SF	.01	100.00	.01	100.00	200.00
2. FORMWORK							
a. Footing (Turndown)	180	SF	1.00	180.00	.75	135.00	315.00
b. Column	20	SF	1.50	30.00	.75	15.00	45.00
3. CONCRETE							
a. Footings	8	CY	50.00	400.00	62.00	496.00	896.00
b. Slab on Grade	13	CY	50.00	650.00	62.00	806.00	1456.00
c. Column	.5	CY	65.00	32.50	62.00	31.00	63.50
d. Joints							
(1) Constr. H.	24	LF	.20	4.80	.40	9.60	14.40
e. Finish							
(1) Float	292	SF	.12	35.04	.05	14.60	49.64
(2) Steel Trowel	728	SF	.18	131.04	.05	36.40	167.44
f. Cure and Protect	1020	SF	.06	61.20	.06	61.20	122.40
4. REINFORCING							
a. Mesh	290	SF	.09	26.10	.08	23.20	49.30
b. Bar	350	LB	.32	112.00	.26	91.00	203.00

CONSTRUCTION COST ESTIMATE

DATE PREPARED:

SHEET 2 OF 42

PROJECT: ALLENVILLE COMMUNITY DEVELOPMENT

LOCATION: ALLENVILLE, ARIZONA

ARCHITECT ENGINEER: NUMKENA ASSOCIATES

BASIS FOR ESTIMATE:
- ☐ CODE A (No design completed)
- ☐ CODE B (Preliminary design)
- ☒ CODE C (Final design)
- ☐ OTHER (Specify)

DRAWING NO.:

ESTIMATOR: DEREMIAH

CHECKED BY:

SUMMARY	QUANTITY NO. UNITS	QUANTITY UNIT MEAS.	LABOR PER UNIT	LABOR TOTAL	MATERIAL PER UNIT	MATERIAL TOTAL	TOTAL COST
HOUSING - 1 BEDROOM UNIT - PLAN A							
5. ROUGH CARPENTRY							
a. Framing	1320	BF	.65	858.00	.50	660.00	1518.00
b. Sheathing							
(1) Plywood	1210	SF	.30	363.00	.27	326.70	689.00
c. Trusses	1070	SF	.90	963.00	1.52	1626.40	2589.40
d. Wood Beams	54	BF	.75	40.50	.65	35.10	75.60
e. Hardbd Soffitts	380	SF	.30	114.00	.35	133.00	247.00
6. MILLWORK							
a. Exterior Siding	1400	SF	.72	1008.00	.78	1092.00	2100.00
b. Exterior Trim	300	LF	.65	195.00	.50	150.00	345.00
c. Doors and Frames							
(1) Ext. (3^0 x 6^8)	3	EA	60.00	180.00	147.00	441.00	621.00
(2) Int. (2^8 x 6^8)	5	EA	68.00	340.00	70.00	350.00	690.00
d. Cabinets							
Kitchen Cabinets	14	LF	40.00	560.00	98.00	1372.00	1932.00
Closet Shelving	8	LF	3.00	24.00	3.00	24.00	48.00
Linen Shelving	24	LF	2.00	48.00	2.00	48.00	96.00
Sink Counters	3	LF	15.00	45.00	45.00	135.00	180.00
Storage Shelving	16	LF	2.00	32.00	1.50	24.00	56.00
7. MASONRY	NONE						
8. STRUCTURAL STEEL	NONE						

CONSTRUCTION COST ESTIMATE	DATE PREPARED	SHEET 3 OF 42

PROJECT: ALLENVILLE COMMUNITY DEVELOPMENT
LOCATION: ALLENVILLE, ARIZONA
ARCHITECT ENGINEER: NUMKENA ASSOCIATES

BASIS FOR ESTIMATE
- ☐ CODE A (No design completed)
- ☐ CODE B (Preliminary design)
- ☒ CODE C (Final design)
- ☐ OTHER (Specify)

DRAWING NO.
ESTIMATOR: DEREMIAH
CHECKED BY

SUMMARY	QUANTITY NO. UNITS	QUANTITY UNIT MEAS.	LABOR PER UNIT	LABOR TOTAL	MATERIAL PER UNIT	MATERIAL TOTAL	TOTAL COST
HOUSING - 1 BEDROOM UNIT - PLAN A							
9. SHEET METAL							
a. Flashing	80	LF	.50	40.00	.65	52.00	92.00
b. Gutter	76	LF	.60	45.60	1.70	129.20	174.80
c. Downspout	40	LF	.75	30.00	2.70	108.00	138.00
10. ROOFING							
a. Metal Roofing	12.5	SQ	46.00	575.00	51.00	637.50	1212.50
11. LATH AND PLASTERING							
a. Gyp. Bd. Walls	230	SY	2.72	625.60	2.46	565.80	1191.40
b. Gyp. Bd. Ceilings	70	SY	2.72	190.40	2.46	172.20	362.60
12. TILE WORK	NONE			-		-	
13. METAL SASH							
a. Single Hung	44	SF	3.49	153.56	5.14	226.16	379.72
b. Sliding	17	SF	3.49	59.33	4.76	80.92	140.25
14. GLASS AND GLAZING (incl. under met sash)							
15. MISC. METALS	NONE			-		-	
16. PAINTING							
a. Exterior							
(1) Wd Siding, Trim	1400	SF	.15	210.00	.08	112.00	322.00
(2) Hd Bd Soffitts	380	SF	.17	64.60	.12	45.60	110.20

CONSTRUCTION COST ESTIMATE	DATE PREPARED	SHEET 4 OF 42

PROJECT: ALLENVILLE COMMUNITY DEVELOPMENT

LOCATION: ALLENVILLE, ARIZONA

ARCHITECT ENGINEER: NUMKENA ASSOCIATES

BASIS FOR ESTIMATE
- ☐ CODE A (No design completed)
- ☐ CODE B (Preliminary design)
- ☒ CODE C (Final design)
- ☐ OTHER (Specify)

DRAWING NO.

ESTIMATOR: DEREMIAH

CHECKED BY

SUMMARY	QUANTITY NO. UNITS	QUANTITY UNIT MEAS.	LABOR PER UNIT	LABOR TOTAL	MATERIAL PER UNIT	MATERIAL TOTAL	TOTAL COST
HOUSING - 1 BEDROOM UNIT - PLAN A							
16. PAINTING (cont'd)							
b. Interior							
(1) Gyp Bd	2700	SF	.15	405.00	.08	216.00	621.00
(2) Doors	8	EA	21.00	168.00	7.00	56.00	224.00
17. FLOOR COVERING							
a. Vinyl Asbestos Tile	224	SF	.44	98.56	.37	82.88	181.44
b. Carpet	60	SY	6.00	360.00	8.00	480.00	840.00
18. THERMAL INSULATION							
a. Attic	728	SF	.14	101.92	.38	276.64	378.56
b. Walls	1300	SF	.14	182.00	.15	195.00	377.00
19. FINISH HARDWARE							
a. Door Hardware		LS	180	180.00	222	222.00	402.00
b. Toilet Accessories		LS	60.00	60.00	95.00	95.00	155.00
c. Toilet Compartments		EA	100	-	180	-	
20. MECHANICAL SYSTEMS							
a. Electric Heater	1	EA	165	165.00	110	110.00	275.00
b. Evaporative Cooler	1	EA	290	290.00	430	430.00	720.00
c. Ductwork		LS	458	458.00	458	458.00	916.00
d. Controls		LS	60.00	60.00	60.00	60.00	120.00
21. PLUMBING							
a. Fixtures	4	EA	80.00	320.00	120	480.00	800.00
b. Piping		LS	1300	1300.00	1000	1000.00	2300.00
c. Hot Water Heater	1	EA	100	100.00	100	100.00	200.00

CONSTRUCTION COST ESTIMATE	DATE PREPARED	SHEET 5 OF 42

PROJECT: ALLENVILLE COMMUNITY DEVELOPMENT

LOCATION: ALLENVILLE, ARIZONA

ARCHITECT ENGINEER: NUMKENA ASSOCIATES

BASIS FOR ESTIMATE
- ☐ CODE A (No design completed)
- ☐ CODE B (Preliminary design)
- ☒ CODE C (Final design)
- ☐ OTHER (Specify)

DRAWING NO.

ESTIMATOR: DEREMIAH

CHECKED BY

SUMMARY	QUANTITY NO. UNITS	QUANTITY UNIT MEAS.	LABOR PER UNIT	LABOR TOTAL	MATERIAL PER UNIT	MATERIAL TOTAL	TOTAL COST
HOUSING - 1 BEDROOM UNIT - PLAN A							
22. ELECTRICAL SYSTEM							
a. Branch Circuits		LS	290	290.00	200	200.00	490.00
b. Fixtures & Devices		LS	320	320.00	275	275.00	595.00
c. Panel Boards	1	EA	160	160.00	185	185.00	345.00
d. Feeders	NONE			-		-	
e. Door Bell	1	EA	90.00	90.00	60.00	60.00	150.00
SUBTOTAL							29,694.90
OVERHEAD (10%)							2969.49
PROFIT (5%)							1633.22
SUBTOTAL							34,297.61
BOND (1%)							342.98
TOTAL COST							34,640.59
TOTAL ROUNDED							34,700.00
BUILDING AREA: 730 SF							
PRICE PER SF: 47.53							

CONSTRUCTION COST ESTIMATE	DATE PREPARED	SHEET 6 OF 42

PROJECT: ALLENVILLE COMMUNITY DEVELOPMENT
LOCATION: ALLENVILLE, ARIZONA
ARCHITECT ENGINEER: NUMKENA ASSOCIATES

BASIS FOR ESTIMATE
- ☐ CODE A (No design completed)
- ☐ CODE B (Preliminary design)
- ☒ CODE C (Final design)
- ☐ OTHER (Specify)

DRAWING NO.:
ESTIMATOR: DEREMIAH
CHECKED BY:

SUMMARY	QUANTITY NO. UNITS	QUANTITY UNIT MEAS.	LABOR PER UNIT	LABOR TOTAL	MATERIAL PER UNIT	MATERIAL TOTAL	TOTAL COST
HOUSING - 1 BEDROOM UNIT - PLAN B							
1. EARTHWORK							
a. Machine Excavation	10	CY	5.00	50.00	12.00	120.00	170.00
b. Hand Excavation	1	CY	28.75	28.75	-		28.75
c. Backfill	10	CY	6.50	65.00	5.00	50.00	115.00
d. Cap. Water Barrier	14	CY	11.00	154.00	12.00	168.00	322.00
e. Fine Grade	10,000	SF	.01	100.00	.01	100.00	200.00
2. FORMWORK							
a. Footing (Turndown)	180	SF	1.00	180.00	.75	135.00	315.00
b. Column	15	SF	1.50	22.50	.75	11.25	33.75
3. CONCRETE							
a. Footings	6		50.00	300.00	62.00	372.00	672.00
b. Slab on Grade	14		50.00	700.00	62.00	868.00	1568.00
c. Column	.5		65.00	32.50	62.00	31.00	63.50
d. Joints							
(1) Constr. H.	20		.20	4.00	.40	8.00	12.00
e. Finish							
(1) Float	430	SF	.12	51.60	.05	21.50	73.10
(2) Steel Trowel	700	SF	.18	126.00	.05	35.00	161.00
f. Cure and Protect	1130	SF	.06	67.80	.06	67.80	135.60
4. REINFORCING							
a. Mesh	430	SF	.09	38.70	.08	34.40	73.10
b. Bar	350	LB	.32	112.00	.26	91.00	203.00

CONSTRUCTION COST ESTIMATE	DATE PREPARED	SHEET 7 OF 42

PROJECT: ALLENVILLE COMMUNITY DEVELOPMENT

LOCATION: ALLENVILLE, ARIZONA

ARCHITECT ENGINEER: NUMKENA ASSOCIATES

BASIS FOR ESTIMATE
- ☐ CODE A (No design completed)
- ☐ CODE B (Preliminary design)
- ☒ CODE C (Final design)
- ☐ OTHER (Specify)

DRAWING NO.

ESTIMATOR: DEREMIAH

CHECKED BY

SUMMARY	QUANTITY NO. UNITS	QUANTITY UNIT MEAS.	LABOR PER UNIT	LABOR TOTAL	MATERIAL PER UNIT	MATERIAL TOTAL	TOTAL COST
HOUSING - 1 BEDROOM UNIT - PLAN B							
5. ROUGH CARPENTRY							
a. Framing	1200	BF	.65	780.00	.50	600.00	1380.00
b. Sheathing							
(1) Plywood	1260	SF	.30	378.00	.27	340.20	718.20
c. Trusses	1130	SF	.90	1017.00	1.52	1717.60	2734.60
d. Wood Beams	108	BF	.75	81.00	.65	70.20	151.20
e. Hardbd Soffitts	408	SF	.30	122.40	.35	142.80	265.20
6. MILLWORK							
a. Exterior Siding	1500	SF	.72	1080.00	.78	1170.00	2250.00
b. Exterior Trim	250	LF	.65	162.50	.50	125.00	287.50
c. Doors and Frames							
(1) Ext. (3^0 x 6^8)	3	EA	60.00	180.00	147	441.00	621.00
(2) Int. (2^8 x 6^8)	4	EA	68.00	272.00	70.00	280.00	552.00
d. Cabinets							
Kitchen Cabinets	14	LF	40.00	560.00	98.00	1372.00	1932.00
Closet Shelving	8	LF	3.00	24.00	3.00	24.00	48.00
Linen Shelving	24	LF	2.00	48.00	2.00	48.00	96.00
Sink Counters	3	LF	15.00	45.00	45.00	135.00	180.00
Storage Shelving	16	LF	2.00	32.00	1.50	24.00	56.00
7. MASONRY	NONE						
8. STRUCTURAL STEEL	NONE						

CONSTRUCTION COST ESTIMATE	DATE PREPARED	SHEET 8 OF 42

PROJECT: ALLENVILLE COMMUNITY DEVELOPMENT

LOCATION: ALLENVILLE, ARIZONA

ARCHITECT ENGINEER: NUMKENA ASSOCIATES

BASIS FOR ESTIMATE: ☐ CODE A (No design completed) ☐ CODE B (Preliminary design) ☒ CODE C (Final design) ☐ OTHER (Specify)

DRAWING NO.

ESTIMATOR: DEREMIAH

CHECKED BY

SUMMARY	QUANTITY NO. UNITS	QUANTITY UNIT MEAS.	LABOR PER UNIT	LABOR TOTAL	MATERIAL PER UNIT	MATERIAL TOTAL	TOTAL COST
HOUSING - 1 BEDROOM UNIT - PLAN B							
9. SHEET METAL							
a. Flashing	76	LF	.50	38.00	.65	49.40	87.50
b. Gutter	72	LF	.60	43.20	1.70	122.40	165.60
c. Downspout	32	LF	.75	24.00	2.70	86.40	110.40
10. ROOFING							
a. Metal Roofing	13	SQ	46.00	598.00	51.00	663.00	1261.00
11. LATH AND PLASTERING							
a. Gyp. Bd. Walls	230	SY	2.72	625.60	2.46	565.80	1191.40
b. Gyp. Bd. Ceilings	72	SY	2.72	195.84	2.46	177.12	372.96
12. TILE WORK	NONE			-		-	
13. METAL SASH							
a. Single Hung	34	SF	3.49	118.66	5.14	174.76	293.42
b. Sliding	17	SF	3.49	59.33	4.76	80.92	140.25
14. GLASS AND GLAZING (incl. under met sash)							
15. MISC. METALS	NONE			-		-	
16. PAINTING							
a. Exterior							
(1) Wd Siding, Trim	1500	SF	.15	225.00	.08	120.00	345.00
(2) Hd Bd Soffitts	408	SF	.17	69.36	.12	48.96	118.32

CONSTRUCTION COST ESTIMATE	DATE PREPARED	SHEET 9 OF 42

PROJECT: ALLENVILLE COMMUNITY DEVELOPMENT

LOCATION: ALLENVILLE, ARIZONA

ARCHITECT ENGINEER: NUMKENA ASSOCIATES

BASIS FOR ESTIMATE:
- ☐ CODE A (No design completed)
- ☐ CODE B (Preliminary design)
- ☒ CODE C (Final design)
- ☐ OTHER (Specify)

DRAWING NO.:

ESTIMATOR: DEREMIAH

CHECKED BY:

SUMMARY	QUANTITY NO. UNITS	QUANTITY UNIT MEAS.	LABOR PER UNIT	LABOR TOTAL	MATERIAL PER UNIT	MATERIAL TOTAL	TOTAL COST
HOUSING - 1 BEDROOM UNIT - PLAN B							
16. PAINTING (cont'd)							
b. Interior							
(1) Gyp Bd	2700	SF	.15	405.00	.08	168.00	573.00
(2) Doors	8	EA	21.00	168.00	7.00	56.00	224.00
17. FLOOR COVERING							
a. Vinyl Asbestos Tile	216	SF	.44	95.04	.37	79.92	174.96
b. Carpet	60	SY	6.00	360.00	8.00	480.00	840.00
18. THERMAL INSULATION							
a. Attic	730	SF	.14	102.20	.38	277.40	379.60
b. Walls	1300	SF	.14	182.00	.15	195.00	377.00
19. FINISH HARDWARE							
a. Door Hardware		LS	180	180.00	222	222.00	402.00
b. Toilet Accessories		LS	60	60.00	95.00	95.00	155.00
c. Toilet Compartments		EA	100	-	180	-	
20. MECHANICAL SYSTEMS							
a. Electric Heater	1	EA	165	165.00	110	110.00	275.00
b. Evaporative Cooler	1	EA	290	290.00	430	430.00	720.00
c. Ductwork		LS	458	458.00	458	458.00	916.00
d. Controls		LS	60	60.00	60.00	60.00	120.00
21. PLUMBING							
a. Fixtures	4	EA	80.00	320.00	120	480.00	800.00
b. Piping		LS	1300	1300.00	1000	1000.00	2300.00
c. Hot Water Heater	1	EA	100	100.00	100	100.00	200.00

CONSTRUCTION COST ESTIMATE	DATE PREPARED	SHEET 10 OF 42

PROJECT: ALLENVILLE COMMUNITY DEVELOPMENT

LOCATION: ALLENVILLE, ARIZONA

ARCHITECT ENGINEER: NUMKENA ASSOCIATES

BASIS FOR ESTIMATE
- ☐ CODE A (No design completed)
- ☐ CODE B (Preliminary design)
- ☒ CODE C (Final design)
- ☐ OTHER (Specify)

DRAWING NO.:

ESTIMATOR: DEREMIAH

CHECKED BY:

SUMMARY	QUANTITY NO. UNITS	QUANTITY UNIT MEAS.	LABOR PER UNIT	LABOR TOTAL	MATERIAL PER UNIT	MATERIAL TOTAL	TOTAL COST
HOUSING - 1 BEDROOM UNIT - PLAN B							
22. ELECTRICAL SYSTEM							
a. Branch Circuits		LS	290	290.00	200	200.00	490.00
b. Fixtures & Devices		LS	320	320.00	275	275.00	595.00
c. Panel Boards	1	EA	160	160.00	185	185.00	345.00
d. Feeders	NONE			-		-	
e. Door Bell	1	EA	90	90.00	60.00	60.00	150.00
SUBTOTAL							29,611.91
OVERHEAD (10%)							2961.19
PROFIT (5%)							1628.66
SUBTOTAL							34,201.76
BOND (1%)							342.02
TOTAL COST							34,543.78
TOTAL ROUNDED							34,600.00
BUILDING AREA: 700 SF.							
PRICE PER SF: 49.43							

CONSTRUCTION COST ESTIMATE	DATE PREPARED	SHEET 11 OF 42

PROJECT: ALLENVILLE COMMUNITY DEVELOPMENT
LOCATION: ALLENVILLE, ARIZONA
ARCHITECT ENGINEER: NUMKENA ASSOCIATES

BASIS FOR ESTIMATE
- ☐ CODE A (No design completed)
- ☐ CODE B (Preliminary design)
- ☒ CODE C (Final design)
- ☐ OTHER (Specify)

DRAWING NO.
ESTIMATOR: DEREMIAH
CHECKED BY

SUMMARY	QUANTITY NO. UNITS	QUANTITY UNIT MEAS.	LABOR PER UNIT	LABOR TOTAL	MATERIAL PER UNIT	MATERIAL TOTAL	TOTAL COST
HOUSING - 2 BEDROOM UNIT - PLAN A							
1. EARTHWORK							
a. Machine Excavation	10	CY	5.00	50.00	12.00	120.00	170.00
b. Hand Excavation	1	CY	28.75	28.75	-		28.75
c. Backfill	10	CY	6.50	65.00	5.00	50.00	115.00
d. Cap. Water Barrier	12	CY	11.00	132.00	12.00	144.00	276.00
e. Fine Grade	10,000	SF	.01	100.00	.01	100.00	200.00
2. FORMWORK							
a. Footing (Turndown)	160	SF	1.00	160.00	.75	120.00	280.00
b. Column	20	SF	1.50	30.00	.75	15.00	45.00
3. CONCRETE							
a. Footings	6		50.00	300.00	62.00	372.00	672.00
b. Slab on Grade	16		50.00	800.00	62.00	992.00	1,792.00
c. Column	.5		65.00	32.50	62.00	31.00	63.50
d. Joints							
(1) Constr. Jt.	28		.20	5.60	.40	11.20	16.80
e. Finish							
(1) Float	368	SF	.12	44.16	.05	18.40	62.56
(2) Steel Trowel	904	SF	.18	162.72	.05	45.20	207.92
f. Cure and Protect	1270	SF	.06	76.20	.06	76.20	152.40
4. REINFORCING							
a. Mesh	290	SF	.09	26.10	.08	23.20	49.30
b. Bar	390	LB	.32	124.80	.26	101.40	226.20

CONSTRUCTION COST ESTIMATE

DATE PREPARED

PROJECT: ALLENVILLE COMMUNITY DEVELOPMENT

LOCATION: ALLENVILLE, ARIZONA

ARCHITECT ENGINEER: NUMKENA ASSOCIATES

BASIS FOR ESTIMATE
- ☐ CODE A (No design completed)
- ☐ CODE B (Preliminary design)
- ☒ CODE C (Final design)
- ☐ OTHER (Specify)

DRAWING NO.

ESTIMATOR: DEREMIAH

CHECKED BY

SUMMARY	QUANTITY NO. UNITS	QUANTITY UNIT MEAS.	LABOR PER UNIT	LABOR TOTAL	MATERIAL PER UNIT	MATERIAL TOTAL	TOTAL COST
HOUSING - 2 BEDROOM UNIT - PLAN A							
5. ROUGH CARPENTRY							
a. Framing	1780	BF	.65	1157.00	.50	890.00	2,047.00
b. Sheathing							
(1) Plywood	1430	SF	.30	429.00	.27	386.10	815.10
c. Trusses	1270	SF	.90	1143.00	1.52	1930.00	3,073.00
d. Wood Beams	120	BF	.75	90.00	.65	78.00	168.00
e. Hardbd Soffitts	368	SF	.30	110.40	.35	128.80	239.20
6. MILLWORK							
a. Exterior Siding	1450	SF	.72	1044.00	.78	1131.00	2,175.00
b. Exterior Trim	250	LF	.65	162.50	.50	125.00	287.50
c. Doors and Frames							
(1) Ext. (3^0 x 6^8)	3	EA	60.00	180.00	147.00	441.00	621.00
(2) Int. (2^8 x 6^8)	7	EA	68.00	476.00	70.00	490.00	966.00
d. Cabinets							
Kitchen Cabinets	14	LF	40.00	560.00	98.00	1372.00	1,932.00
Closet Shelving	16	LF	3.00	48.00	3.00	48.00	96.00
Linen Shelving	20	LF	2.00	40.00	2.00	40.00	80.00
Sink Counters	3	LF	15.00	45.00	45.00	135.00	180.00
Storage Shelving	16	LF	2.00	32.00	1.50	24.00	56.00
7. MASONRY	NONE						
8. STRUCTURAL STEEL	NONE						

CONSTRUCTION COST ESTIMATE

DATE PREPARED:

SHEET 13 OF 42

PROJECT: ALLENVILLE COMMUNITY DEVELOPMENT

LOCATION: ALLENVILLE, ARIZONA

ARCHITECT ENGINEER: NUMKENA ASSOCIATES

BASIS FOR ESTIMATE:
- ☐ CODE A (No design completed)
- ☐ CODE B (Preliminary design)
- ☒ CODE C (Final design)
- ☐ OTHER (Specify)

DRAWING NO.:

ESTIMATOR: DEREMIAH

CHECKED BY:

SUMMARY	QUANTITY NO. UNITS	QUANTITY UNIT MEAS.	LABOR PER UNIT	LABOR TOTAL	MATERIAL PER UNIT	MATERIAL TOTAL	TOTAL COST
HOUSING - 2 BEDROOM UNIT - PLAN A							
9. SHEET METAL							
a. Flashing	100	LF	.50	50.00	.65	65.00	115.00
b. Gutter	92	LF	.60	55.20	1.70	156.40	211.60
c. Downspout	48	LF	.75	36.00	2.70	129.60	165.60
10. ROOFING							
a. Metal Roofing	15	SQ	46.00	690.00	51.00	765.00	1,455.00
11. LATH AND PLASTERING							
a. Gyp. Bd. Walls	310	SY	2.72	843.20	2.46	762.60	1,605.80
b. Gyp. Bd. Ceilings	95	SY	2.72	258.40	2.46	233.70	492.10
12. TILE WORK	NONE			-		-	
13. METAL SASH	64		3.49	223.36	5.14	328.96	552.32
a. Single Hung	17	SF	3.49	59.33	4.76	80.92	140.25
b. Sliding		SF					
14. GLASS AND GLAZING							
(incl. under met sash)							
15. MISC. METALS	NONE						
16. PAINTING							
a. Exterior							
(1) Wd Siding, Trim	1450	SF	.15	217.50	.08	116.00	333.50
(2) Hd Bd Soffitts	408	SF	.17	69.36	.12	48.96	118.32

CONSTRUCTION COST ESTIMATE	DATE PREPARED	SHEET 14 OF 42

PROJECT: ALLENVILLE COMMUNITY DEVELOPMENT

LOCATION: ALLENVILLE, ARIZONA

ARCHITECT ENGINEER: NUMKENA ASSOCIATES

BASIS FOR ESTIMATE
- ☐ CODE A (No design completed)
- ☐ CODE B (Preliminary design)
- ☒ CODE C (Final design)
- ☐ OTHER (Specify)

DRAWING NO.:

ESTIMATOR: DEREMIAH

CHECKED BY:

SUMMARY	QUANTITY NO. UNITS	QUANTITY UNIT MEAS.	LABOR PER UNIT	LABOR TOTAL	MATERIAL PER UNIT	MATERIAL TOTAL	TOTAL COST
HOUSING - 2 BEDROOM UNIT - PLAN A							
16. PAINTING (cont'd)							
b. Interior							
(1) Gyp Bd	3670	SF	.15	550.50	.08	293.60	844.10
(2) Doors	10	EA	21.00	210.00	7.00	70.00	280.00
17. FLOOR COVERING							
a. Vinyl Asbestos Tile	240	SF	.44	105.60	.37	88.80	194.40
b. Carpet	75	SY	6.00	450.00	8.00	600.00	1,050.00
18. THERMAL INSULATION							
a. Attic	860	SF	.14	120.40	.38	326.80	447.20
b. Walls	1300	SF	.14	182.00	.15	195.00	377.00
19. FINISH HARDWARE							
a. Door Hardware		LS	250	250.00	320	320.00	570.00
b. Toilet Accessories		LS	60	60.00	95	95.00	155.00
c. Toilet Compartments		EA	100	-	180	-	
20. MECHANICAL SYSTEMS							
a. Electric Heater	1	EA	165	165.00	120	120.00	285.00
b. Evaporative Cooler	1	EA	290	290.00	445	445.00	735.00
c. Ductwork		LS	540	540.00	540	540.00	1,080.00
d. Controls		LS	60	60.00	60	60.00	120.00
21. PLUMBING							
a. Fixtures	4	EA	80	320.00	120	480.00	800.00
b. Piping		LS	1300	1300.00	1000	1000.00	2,300.00
c. Hot Water Heater		EA	100	100.00	100	100.00	200.00

CONSTRUCTION COST ESTIMATE	DATE PREPARED	SHEET 15 OF 42

PROJECT: ALLENVILLE COMMUNITY DEVELOPMENT

LOCATION: ALLENVILLE, ARIZONA

ARCHITECT ENGINEER: NUMKENA ASSOCIATES

BASIS FOR ESTIMATE:
- ☐ CODE A (No design completed)
- ☐ CODE B (Preliminary design)
- ☒ CODE C (Final design)
- ☐ OTHER (Specify)

DRAWING NO.

ESTIMATOR: DEREMIAH

CHECKED BY

SUMMARY	QUANTITY NO. UNITS	QUANTITY UNIT MEAS.	LABOR PER UNIT	LABOR TOTAL	MATERIAL PER UNIT	MATERIAL TOTAL	TOTAL COST
HOUSING - 2 BEDROOM UNIT - PLAN A							
22. ELECTRICAL SYSTEM							
a. Branch Circuits		LS	410	410.00	300	300.00	710.00
b. Fixtures & Devices		LS	480	480.00	415	415.00	895.00
c. Panel Boards	1	EA	160	160.00	185	185.00	345.00
d. Feeders	NONE						
e. Door Bell	1	EA	90	90.00	60	60.00	150.00
SUBTOTAL							33,847.12
OVERHEAD (10%)							3,384.71
PROFIT (5%)							1,861.59
SUBTOTAL							39,093.42
BOND (1%)							390.93
TOTAL COST							39,484.35
TOTAL ROUNDED							39,500.00
BUILDING AREA:							
PRICE PER SF:							

CONSTRUCTION COST ESTIMATE

DATE PREPARED

PROJECT: ALLENVILLE COMMUNITY DEVELOPMENT

LOCATION: ALLENVILLE, ARIZONA

ARCHITECT ENGINEER: NUMKENA ASSOCIATES

BASIS FOR ESTIMATE
- ☐ CODE A (No design completed)
- ☐ CODE B (Preliminary design)
- ☒ CODE C (Final design)
- ☐ OTHER (Specify)

DRAWING NO.

ESTIMATOR: DEREMIAH

CHECKED BY

SUMMARY	QUANTITY NO. UNITS	QUANTITY UNIT MEAS.	LABOR PER UNIT	LABOR TOTAL	MATERIAL PER UNIT	MATERIAL TOTAL	TOTAL COST
HOUSING - 2 BEDROOM UNIT - PLAN B							
1. EARTHWORK							
a. Machine Excavation	10	CY	5.00	50.00	12.00	120.00	170.00
b. Hand Excavation	1	CY	28.75	28.75	-		28.75
c. Backfill	10	CY	6.50	65.00	5.00	50.00	115.00
d. Cap. Water Barrier	15	CY	11.00	165.00	12.00	180.00	345.00
e. Fine Grade	10,000	SF	.01	100.00	.01	100.00	200.00
2. FORMWORK							
a. Footing (Turndown)	170	SF	1.00	170.00	.75	127.50	297.50
b. Column	20	SF	1.50	30.00	.75	15.00	45.00
3. CONCRETE							
a. Footings	5		50.00	250.00	62.00	310.00	560.00
b. Slab on Grade	16		50.00	800.00	62.00	992.00	1,792.00
c. Column	.5		65.00	32.50	62.00	31.00	63.50
d. Joints							
(1) Constr. Jt.	26		.20	5.20	.40	10.40	15.60
e. Finish							
(1) Float	410	SF	.12	49.20	.05	20.50	69.70
(2) Steel Trowel	840	SF	.18	151.20	.05	42.00	193.20
f. Cure and Protect	1250	SF	.06	75.00	.06	75.00	150.00
4. REINFORCING							
a. Mesh	410	SF	.09	36.90	.08	32.80	69.70
b. Bar	390	LB	.32	124.80	.26	101.40	226.20

CONSTRUCTION COST ESTIMATE	DATE PREPARED	SHEET 17 OF 42

PROJECT: ALLENVILLE COMMUNITY DEVELOPMENT

LOCATION: ALLENVILLE, ARIZONA

ARCHITECT ENGINEER: NUMKENA ASSOCIATES

BASIS FOR ESTIMATE:
- ☐ CODE A (No design completed)
- ☐ CODE B (Preliminary design)
- ☒ CODE C (Final design)
- ☐ OTHER (Specify)

DRAWING NO.:

ESTIMATOR: DEREMIAH

CHECKED BY:

SUMMARY	QUANTITY NO. UNITS	QUANTITY UNIT MEAS.	LABOR PER UNIT	LABOR TOTAL	MATERIAL PER UNIT	MATERIAL TOTAL	TOTAL COST
HOUSING - 2 BEDROOM UNIT - PLAN B							
5. ROUGH CARPENTRY							
a. Framing	1740	BF	.65	1131.00	.50	870.00	2001.00
b. Sheathing							
(1) Plywood	1450	SF	.30	435.00	.27	391.50	826.50
c. Trusses	1200	SF	.90	1080.00	1.52	1824.00	2904.00
d. Wood Beams	96	BF	.75	72.00	.65	62.40	134.40
e. Hardbd Soffitts	408	SF	.30	122.40	.35	142.80	265.20
6. MILLWORK							
a. Exterior Siding	1420	SF	.72	1022.40	.78	1107.60	2130.00
b. Exterior Trim	220	LF	.65		.50		
c. Doors and Frames							
(1) Ext. (3^0 x 6^8)	3	EA	60.00	180.00	147	441.00	621.00
(2) Int. (2^8 x 6^8)	7	EA	68.00	476.00	70.00	490.00	966.00
d. Cabinets							
Kitchen Cabinets	14	LF	40.00	560.00	98.00	1372.00	1932.00
Closet Shelving	16	LF	3.00	48.00	3.00	48.00	96.00
Linen Shelving	20	LF	2.00	40.00	2.00	40.00	80.00
Sink Counters	3	LF	15.00	45.00	45.00	135.00	180.00
Storage Shelving	16	LF	2.00	32.00	1.50	24.00	56.00
7. MASONRY	NONE						
8. STRUCTURAL STEEL	NONE						

CONSTRUCTION COST ESTIMATE

DATE PREPARED

SHEET 18 OF 42

PROJECT: ALLENVILLE COMMUNITY DEVELOPMENT

LOCATION: ALLENVILLE, ARIZONA

ARCHITECT ENGINEER: NUMKENA ASSOCIATES

BASIS FOR ESTIMATE
- ☐ CODE A (No design completed)
- ☐ CODE B (Preliminary design)
- ☒ CODE C (Final design)
- ☐ OTHER (Specify)

DRAWING NO.

ESTIMATOR: DEREMIAH

CHECKED BY

SUMMARY	QUANTITY NO. UNITS	QUANTITY UNIT MEAS.	LABOR PER UNIT	LABOR TOTAL	MATERIAL PER UNIT	MATERIAL TOTAL	TOTAL COST
HOUSING - 2 BEDROOM - PLAN B							
9. SHEET METAL							
a. Flashing	90	LF	.50	45.00	.65	58.50	103.50
b. Gutter	92	LF	.60	55.20	1.70	156.40	211.60
c. Downspout	40	LF	.75	30.00	2.70	108.00	138.00
10. ROOFING							
a. Metal Roofing	15	SQ	46.00	690.00	51.00	765.00	1455.00
11. LATH AND PLASTERING							
a. Gyp. Bd. Walls	290	SY	2.72	788.80	2.46	713.40	1502.20
b. Gyp. Bd. Ceilings	94	SY	2.72	255.68	2.46	231.24	486.92
12. TILE WORK	NONE						
13. METAL SASH	60		3.49	209.40	5.14	308.40	517.80
a. Single Hung	17	SF	3.49	59.33	4.76	80.92	140.25
b. Sliding		SF					
14. GLASS AND GLAZING (incl. under met sash)							
15. MISC. METALS	NONE						
16. PAINTING							
a. Exterior							
(1) Wd Siding, Trim	1420	SF	.15	213.00	.08	113.60	326.60
(2) Hd Bd Soffitts	408	SF	.17	69.36	.12	48.96	118.32

CONSTRUCTION COST ESTIMATE	DATE PREPARED	SHEET 19 OF 42
PROJECT: ALLENVILLE COMMUNITY DEVELOPMENT	BASIS FOR ESTIMATE: ☐ CODE A (No design completed) ☐ CODE B (Preliminary design) ☒ CODE C (Final design) ☐ OTHER (Specify)	
LOCATION: ALLENVILLE, ARIZONA		
ARCHITECT ENGINEER: NUMKENA ASSOCIATES		
DRAWING NO.	ESTIMATOR: DEREMIAH	CHECKED BY

SUMMARY	QUANTITY NO. UNITS	QUANTITY UNIT MEAS.	LABOR PER UNIT	LABOR TOTAL	MATERIAL PER UNIT	MATERIAL TOTAL	TOTAL COST
HOUSING - 2 BEDROOM UNIT - PLAN B							
16. PAINTING (cont'd)							
b. Interior							
(1) Gyp Bd	3460	SF	.15	519.00	.08	276.80	795.80
(2) Doors	10	EA	21.00	210.00	7.00	70.00	280.00
17. FLOOR COVERING							
a. Vinyl Asbestos Tile	240	SF	.44	105.60	.37	88.80	194.40
b. Carpet	70	SY	6.00	420.00	8.00	560.00	980.00
18. THERMAL INSULATION							
a. Attic	850	SF	.14	119.00	.38	323.00	442.00
b. Walls	960	SF	.14	134.40	.15	144.00	278.40
19. FINISH HARDWARE							
a. Door Hardware		LS	250	250.00	320	320.00	570.00
b. Toilet Accessories		LS	60	60.00	95.00	95.00	155.00
c. Toilet Compartments		EA	100	-	180	-	
20. MECHANICAL SYSTEMS							
a. Electric Heater	1	EA	165	165.00	120	120.00	285.00
b. Evaporative Cooler	1	EA	290	290.00	445	445.00	735.00
c. Ductwork		LS	540	540.00	540	540.00	1080.00
d. Controls		LS	60	60.00	60.00	60.00	120.00
21. PLUMBING							
a. Fixtures	4	EA	80	320.00	120	480.00	800.00
b. Piping		LS	1300	1300.00	1000	1000.00	2300.00
c. Hot Water Heater	1	EA	100	100.00	100	100.00	200.00

CONSTRUCTION COST ESTIMATE	DATE PREPARED	SHEET 20 OF 42

PROJECT: ALLENVILLE COMMUNITY DEVELOPMENT

LOCATION: ALLENVILLE, ARIZONA

ARCHITECT ENGINEER: NUMKENA ASSOCIATES

BASIS FOR ESTIMATE
- ☐ CODE A (No design completed)
- ☐ CODE B (Preliminary design)
- ☒ CODE C (Final design)
- ☐ OTHER (Specify)

DRAWING NO.

ESTIMATOR: DEREMIAH

CHECKED BY

SUMMARY	QUANTITY NO. UNITS	QUANTITY UNIT MEAS.	LABOR PER UNIT	LABOR TOTAL	MATERIAL PER UNIT	MATERIAL TOTAL	TOTAL COST
HOUSING - 2 BEDROOM	UNIT	- PLAN B					
22. ELECTRICAL SYSTEM							
a. Branch Circuits		LS	410	410.00	300	300.00	710.00
b. Fixtures & Devices		LS	480	480.00	415	415.00	895.00
c. Panel Boards	1	EA	160	160.00	185	185.00	345.00
d. Feeders	NONE			-		-	
e. Door Bell	1	EA	90	90.00	60.00	60.00	150.00
JBTOTAL							32,865.84
OVERHEAD (10%)							3,286.58
PROFIT (5%)							1,807.62
SUBTOTAL							37,960.04
BOND (1%)							379.60
TOTAL COST							38,339.64
TOTAL ROUNDED							38,400.00
BUILDING AREA:							
PRICE PER SF:							

CONSTRUCTION COST ESTIMATE	DATE PREPARED	SHEET 21 OF 42

PROJECT: ALLENVILLE COMMUNITY DEVELOPMENT

LOCATION: ALLENVILLE, ARIZONA

ARCHITECT ENGINEER: NUMKENA ASSOCIATES

BASIS FOR ESTIMATE
- ☐ CODE A (No design completed)
- ☐ CODE B (Preliminary design)
- ☒ CODE C (Final design)
- ☐ OTHER (Specify)

DRAWING NO.:

ESTIMATOR: DEREMIAH

CHECKED BY:

SUMMARY	QUANTITY NO. UNITS	QUANTITY UNIT MEAS.	LABOR PER UNIT	LABOR TOTAL	MATERIAL PER UNIT	MATERIAL TOTAL	TOTAL COST
HOUSING - 3 BEDROOM UNIT							
1. EARTHWORK							
a. Machine Excavation	14	CY	5.00	70.00	12.00	168.00	238.00
b. Hand Excavation	1.5	CY	28.75	43.13	-		43.13
c. Backfill	12	CY	6.50	78.00	5.00	60.00	138.00
d. Cap. Water Barrier	20	CY	11.00	220.00	12.00	240.00	460.00
e. Fine Grade	10,000	SF	.01	100.00	.01	100.00	200.00
2. FORMWORK							
a. Footing (Turndown)	190	SF	1.00	190.00	.75	142.50	332.50
b. Column	25	SF	1.50	37.50	.75	18.75	56.25
3. CONCRETE							
a. Footings	7		50.00	350.00	62.00	434.00	784.00
b. Slab on Grade	19		50.00	950.00	62.00	1178.00	2128.00
c. Column	1		65.00	65.00	62.00	62.00	137.00
d. Joints							
(1) Constr. Jt.	20		.20	4.00	.40	8.00	12.00
e. Finish							
(1) Float	480	SF	.12	57.60	.05	24.00	81.60
(2) Steel Trowel	1112	SF	.18	200.16	.05	55.60	255.76
f. Cure and Protect	1590	SF	.06	95.40	.06	95.40	190.80
4. REINFORCING							
a. Mesh	480	SF	.09	43.20	.08	38.40	81.60
b. Bar	420	LB	.32	134.40	.26	109.20	243.60

CONSTRUCTION COST ESTIMATE	DATE PREPARED	SHEET 22 OF 42

PROJECT: ALLENVILLE COMMUNITY DEVELOPMENT

LOCATION: ALLENVILLE, ARIZONA

ARCHITECT ENGINEER: NUMKENA ASSOCIATES

BASIS FOR ESTIMATE:
- ☐ CODE A (No design completed)
- ☐ CODE B (Preliminary design)
- ☒ CODE C (Final design)
- ☐ OTHER (Specify)

DRAWING NO.:

ESTIMATOR: DEREMIAH

CHECKED BY:

SUMMARY	QUANTITY NO. UNITS	QUANTITY UNIT MEAS.	LABOR PER UNIT	LABOR TOTAL	MATERIAL PER UNIT	MATERIAL TOTAL	TOTAL COST
HOUSING - 3 BEDROOM UNIT							
5. ROUGH CARPENTRY							
a. Framing	2050	BF	.65	1332.50	.50	1025.00	2357.50
b. Sheathing							
(1) Plywood	1790	SF	.30	537.00	.27	483.30	1020.30
c. Trusses	1510	SF	.90	1359.00	1.52	2295.20	3654.20
d. Wood Beams	150	BF	.75	112.50	.65	97.50	210.00
e. Hardbd Soffitts	448	SF	.30	134.40	.35	156.80	291.20
6. MILLWORK							
a. Exterior Siding	1610	SF	.72	1159.20	.78	1255.80	2415.00
b. Exterior Trim	280	LF	.65	182.00	.50	140.00	322.00
c. Doors and Frames							
(1) Ext. (3^0 x 6^8)	3	EA	60.00	180.00	147	441.00	621.00
(2) Int. (2^8 x 6^8)	9	EA	68.00	612.00	70.00	630.00	1242.00
d. Cabinets							
Kitchen Cabinets	16	LF	40.00	640.00	98.00	1568.00	2208.00
Closet Shelving	18	LF	3.00	54.00	3.00	54.00	108.00
Linen Shelving	20	LF	2.00	40.00	2.00	40.00	80.00
Sink Counters	5	LF	15.00	75.00	45.00	225.00	300.00
Storage Shelving	16	LF	2.00	32.00	1.50	24.00	56.00
7. MASONRY	NONE						
8. STRUCTURAL STEEL	NONE						

CONSTRUCTION COST ESTIMATE	DATE PREPARED	SHEET 23 OF 42

PROJECT
ALLENVILLE COMMUNITY DEVELOPMENT

LOCATION
ALLENVILLE, ARIZONA

ARCHITECT ENGINEER
NUMKENA ASSOCIATES

BASIS FOR ESTIMATE
- ☐ CODE A (No design completed)
- ☐ CODE B (Preliminary design)
- ☒ CODE C (Final design)
- ☐ OTHER (Specify)

DRAWING NO.

ESTIMATOR
DEREMIAH

CHECKED BY

SUMMARY	QUANTITY NO. UNITS	QUANTITY UNIT MEAS.	LABOR PER UNIT	LABOR TOTAL	MATERIAL PER UNIT	MATERIAL TOTAL	TOTAL COST
HOUSING - 3 BEDROOM UNIT							
9. SHEET METAL							
a. Flashing	110	LF	.50	55.00	.65	71.50	126.50
b. Gutter	120	LF	.60	72.00	1.70	204.00	276.00
c. Downspout	40	LF	.75	30.00	2.70	108.00	138.00
10. ROOFING							
a. Metal Roofing	18	SQ	46.00	828.00	51.00	918.00	1746.00
11. LATH AND PLASTERING							
a. Gyp. Bd. Walls	375	SY	2.72	1020.00	2.46	922.50	1942.50
b. Gyp. Bd. Ceilings	120	SY	2.72	326.40	2.46	295.20	621.60
12. TILE WORK	NONE			-		-	
13. METAL SASH							
a. Single Hung	90	SF	3.49	314.10	5.14	462.60	776.70
b. Sliding	17	SF	3.49	59.33	4.76	80.92	140.25
14. GLASS AND GLAZING (incl. under met sash)							
15. MISC. METALS	NONE			-		-	
16. PAINTING							
a. Exterior							
(1) Wd Siding, Trim	1610	SF	.15	241.50	.08	128.80	370.30
(2) Hd Bd Soffitts	448	SF	.17	76.16	.12	53.76	129.92

CONSTRUCTION COST ESTIMATE

DATE PREPARED

PROJECT: ALLENVILLE COMMUNITY DEVELOPMENT

LOCATION: ALLENVILLE, ARIZONA

ARCHITECT ENGINEER: NUMKENA ASSOCIATES

BASIS FOR ESTIMATE
- ☐ CODE A (No design completed)
- ☐ CODE B (Preliminary design)
- ☒ CODE C (Final design)
- ☐ OTHER (Specify)

DRAWING NO.

ESTIMATOR: DEREMIAH

CHECKED BY

SUMMARY	QUANTITY NO. UNITS	QUANTITY UNIT MEAS.	LABOR PER UNIT	LABOR TOTAL	MATERIAL PER UNIT	MATERIAL TOTAL	TOTAL COST
HOUSING - 3 BEDROOM UNIT							
16. PAINTING (cont'd)							
b. Interior							
(1) Gyp Bd	4460	SF	.15	669.00	.08	356.80	1025.80
(2) Doors	12	EA	21.00	252.00	7.00	84.00	336.00
17. FLOOR COVERING							
a. Vinyl Asbestos Tile	218	SF	.44	95.92	.37	80.66	176.58
b. Carpet	100	SY	6.00	600.00	8.00	800.00	1400.00
18. THERMAL INSULATION							
a. Attic	1080	SF	.14	151.20	.38	410.40	561.60
b. Walls	1410	SF	.14	197.40	.15	211.50	408.40
19. FINISH HARDWARE							
a. Door Hardware		LS	300	300.00	380	380.00	680.00
b. Toilet Accessories		LS	60	60.00	95.00	95.00	155.00
c. Toilet Compartments		EA	100	-	180	-	
20. MECHANICAL SYSTEMS							
a. Electric Heater	1	EA	165	165.00	130	130.00	295.00
b. Evaporative Cooler	1	EA	290	290.00	460	460.00	750.00
c. Ductwork		LS	700	700.00	700	700.00	1400.00
d. Controls		LS	60	60.00	60.00	60.00	120.00
21. PLUMBING							
a. Fixtures	4	EA	80.00	320.00	120	480.00	800.00
b. Piping		LS	1300	1300.00	1000	1000.00	2300.00
c. Hot Water Heater	1	EA	100	100.00	100	100.00	200.00

CONSTRUCTION COST ESTIMATE	DATE PREPARED	SHEET 25 OF 42

PROJECT: ALLENVILLE COMMUNITY DEVELOPMENT

LOCATION: ALLENVILLE, ARIZONA

ARCHITECT ENGINEER: NUMKENA ASSOCIATES

BASIS FOR ESTIMATE:
- ☐ CODE A (No design completed)
- ☐ CODE B (Preliminary design)
- ☒ CODE C (Final design)
- ☐ OTHER (Specify)

DRAWING NO.:

ESTIMATOR: DEREMIAH

CHECKED BY:

SUMMARY	QUANTITY NO. UNITS	QUANTITY UNIT MEAS.	LABOR PER UNIT	LABOR TOTAL	MATERIAL PER UNIT	MATERIAL TOTAL	TOTAL COST
HOUSING - 3 BEDROOM UNIT							
22. ELECTRICAL SYSTEM							
a. Branch Circuits		LS	480	480.00	435	435.00	915.00
b. Fixtures & Devices		LS	720	720.00	480	480.00	1200.00
c. Panel Boards	1	EA	160	160.00	185	185.00	345.00
d. Feeders	NONE			-		-	
e. Door Bell	1	EA	90.00	90.00	60.00	60.00	150.00
SUBTOTAL							39,312.79
OVERHEAD (10%)							3,931.28
PROFIT (5%)							2,162.20
SUBTOTAL							45,406.27
BOND (1%)							454.06
TOTAL COST							45,860.33
TOTAL ROUNDED							45,900.00
BUILDING AREA:							
PRICE PER SF:							

ENG FORM 150
1 AUG 39

CONSTRUCTION COST ESTIMATE

DATE PREPARED

PROJECT: ALLENVILLE COMMUNITY DEVELOPMENT

LOCATION: ALLENVILLE, ARIZONA

ARCHITECT ENGINEER: NUMKENA ASSOCIATES

BASIS FOR ESTIMATE
- ☐ CODE A (No design completed)
- ☐ CODE B (Preliminary design)
- ☒ CODE C (Final design)
- ☐ OTHER (Specify)

DRAWING NO.

ESTIMATOR: DEREMIAH

CHECKED BY

SUMMARY	QUANTITY NO. UNITS	QUANTITY UNIT MEAS.	LABOR PER UNIT	LABOR TOTAL	MATERIAL PER UNIT	MATERIAL TOTAL	TOTAL COST
HOUSING - 4 BEDROOM UNIT							
1. EARTHWORK							
a. Machine Excavation	16	CY	5.00	80.00	12.00	192.00	272.00
b. Hand Excavation	2	CY	28.75	57.50	-		57.50
c. Backfill	15	CY	6.50	97.50	5.00	75.00	172.50
d. Cap. Water Barrier	23	CY	11.00	253.00	12.00	276.00	529.00
e. Fine Grade	10,000	SF	.01	100.00	.01	100.00	200.00
2. FORMWORK							
a. Footing (Turndown)	230	SF	1.00	230.00	.75	172.50	402.50
b. Column	25	SF	1.50	37.50	.75	18.75	56.25
3. CONCRETE							
a. Footings	9		50.00	450.00	62.00	558.00	1008.00
b. Slab on Grade	23		50.00	1150.00	62.00	1426.00	2576.00
c. Column	1		65.00	65.00	62.00	62.00	127.00
d. Joints							
(1) Constr. Jt.	44		.20	8.80	.40	17.60	26.40
e. Finish							
(1) Float	460	SF	.12	55.20	.05	23.00	78.20
(2) Steel Trowel	1350	SF	.18	243.00	.05	67,50	310.50
f. Cure and Protect	1810	SF	.06	108.60	.06	108.60	217.20
4. REINFORCING							
a. Mesh	460	SF	.09	41.40	.08	36.80	78.20
b. Bar	450	LB	.32	144.00	.26	117.00	261.00

CONSTRUCTION COST ESTIMATE	DATE PREPARED	SHEET 27 OF 42

PROJECT: ALLENVILLE COMMUNITY DEVELOPMENT

LOCATION: ALLENVILLE, ARIZONA

ARCHITECT ENGINEER: NUMKENA ASSOCIATES

BASIS FOR ESTIMATE:
- ☐ CODE A (No design completed)
- ☐ CODE B (Preliminary design)
- ☒ CODE C (Final design)
- ☐ OTHER (Specify)

DRAWING NO.:

ESTIMATOR: DEREMIAH

CHECKED BY:

SUMMARY	QUANTITY NO. UNITS	QUANTITY UNIT MEAS.	LABOR PER UNIT	LABOR TOTAL	MATERIAL PER UNIT	MATERIAL TOTAL	TOTAL COST
HOUSING - 4 BEDROOM UNIT							
5. ROUGH CARPENTRY							
a. Framing	2450	BF	.65	1592.50	.50	1225.00	2817.50
b. Sheathing							
(1) Plywood	2080	SF	.30	624.00	.27	561.60	1185.60
c. Trusses	1810	SF	.90	1629.00	1.52	2751.20	4380.20
d. Wood Beams	162	BF	.75	121.50	.65	105.30	226.80
e. Hardbd Soffitts	460	SF	.30	138.00	.35	161.00	299.00
6. MILLWORK							
a. Exterior Siding	1860	SF	.72	1339.20	.78	1450.80	2790.00
b. Exterior Trim	300	LF	.65	195.00	.50	150.00	345.00
c. Doors and Frames							
(1) Ext. (3^0 x 6^8)	3	EA	60.00	180.00	147	441.00	621.00
(2) Int. (2^8 x 6^8)	10	EA	68.00	680.00	70.00	700.00	1380.00
d. Cabinets							
Kitchen Cabinets	17	LF	40.00	680.00	98.00	1666.00	2346.00
Closet Shelving	28	LF	3.00	84.00	3.00	84.00	168.00
Linen Shelving	16	LF	2.00	32.00	2.00	32.00	64.00
Sink Counters	7	LF	15.00	105.00	45.00	315.00	420.00
Storage Shelving	16	LF	2.00	32.00	1.50	24.00	56.00
7. MASONRY	NONE						
8. STRUCTURAL STEEL	NONE						

CONSTRUCTION COST ESTIMATE	DATE PREPARED	SHEET 28 OF 42

PROJECT: ALLENVILLE COMMUNITY DEVELOPMENT

LOCATION: ALLENVILLE, ARIZONA

ARCHITECT ENGINEER: NUMKENA ASSOCIATES

BASIS FOR ESTIMATE
- ☐ CODE A (No design completed)
- ☐ CODE B (Preliminary design)
- ☒ CODE C (Final design)
- ☐ OTHER (Specify)

DRAWING NO.

ESTIMATOR: DEREMIAH

CHECKED BY

SUMMARY	QUANTITY NO. UNITS	QUANTITY UNIT MEAS.	LABOR PER UNIT	LABOR TOTAL	MATERIAL PER UNIT	MATERIAL TOTAL	TOTAL COST
HOUSING - 4 BEDROOM UNIT							
9. SHEET METAL							
a. Flashing	110	LF	.50	55.00	.65	71.50	126.50
b. Gutter	140	LF	.60	84.00	1.70	238.00	322.00
c. Downspout	48	LF	.75	36.00	2.70	129.60	165.60
10. ROOFING							
a. Metal Roofing	21	SQ	46.00	966.00	51.00	1071.00	2037.00
11. LATH AND PLASTERING							
a. Gyp. Bd. Walls	460	SY	2.72	1251.20	2.46	1131.60	2382.80
b. Gyp. Bd. Ceilings	50	SY	2.72	136.00	2.46	123.00	259.00
12. TILE WORK	NONE			-		-	
13. METAL SASH							
a. Single Hung	94	SF	3.49	328.06	5.14	483.16	811.22
b. Sliding	21	SF	3.49	73.29	4.76	99.96	173.25
14. GLASS AND GLAZING (incl. under met sash)							
15. MISC. METALS	NONE			-		-	
16. PAINTING							
a. Exterior							
(1) Wd Siding, Trim	1860	SF	.15	279.00	.08	148.80	427.80
(2) Hd Bd Soffitts	460	SF	.17	78.20	.12	55.20	133.40

CONSTRUCTION COST ESTIMATE	DATE PREPARED	SHEET 29 OF 42

PROJECT: ALLENVILLE COMMUNITY DEVELOPMENT

LOCATION: ALLENVILLE, ARIZONA

ARCHITECT ENGINEER: NUMKENA ASSOCIATES

BASIS FOR ESTIMATE
- ☐ CODE A (No design completed)
- ☐ CODE B (Preliminary design)
- ☒ CODE C (Final design)
- ☐ OTHER (Specify)

DRAWING NO.

ESTIMATOR: DEREMIAH

CHECKED BY

SUMMARY	QUANTITY NO. UNITS	QUANTITY UNIT MEAS.	LABOR PER UNIT	LABOR TOTAL	MATERIAL PER UNIT	MATERIAL TOTAL	TOTAL COST
HOUSING - 4 BEDROOM UNIT							
16. PAINTING (cont'd)							
b. Interior							
(1) Gyp Bd	5490	SF	.15	823.50	.08	439.20	1262.70
(2) Doors	13	EA	21.00	273.00	7.00	91.00	364.00
17. FLOOR COVERING							
a. Vinyl Asbestos Tile	274	SF	.44	120.56	.37	101.38	221.94
b. Carpet	120	SY	6.00	720.00	8.00	960.00	1680.00
18. THERMAL INSULATION							
a. Attic	1350	SF	.14	189.00	.38	513.00	702.00
b. Walls	1660	SF	.14	232.40	.15	249.00	481.40
19. FINISH HARDWARE							
a. Door Hardware		LS	325	325.00	410	410.00	735.00
b. Toilet Accessories		LS	-	-	-	-	
c. Toilet Compartments		EA	100	100.00	180	180.00	280.00
20. MECHANICAL SYSTEMS							
a. Electric Heater	1	EA	165	165.00	145	145.00	310.00
b. Evaporative Cooler	1	EA	290	290.00	475	475.00	765.00
c. Ductwork		LS	875	875.00	875	875.00	1750.00
d. Controls		LS	60	60.00	60.00	60.00	120.00
21. PLUMBING							
a. Fixtures	7	EA	80.00	560.00	120	840.00	1400.00
b. Piping		LS	1700	1700.00	1300	1300.00	3000.00
c. Hot Water Heater	1	EA	100	100.00	150	150.00	250.00

CONSTRUCTION COST ESTIMATE

DATE PREPARED:

SHEET 30 OF 42

PROJECT: ALLENVILLE COMMUNITY DEVELOPMENT

LOCATION: ALLENVILLE, ARIZONA

ARCHITECT ENGINEER: NUMKENA ASSOCIATES

BASIS FOR ESTIMATE:
- ☐ CODE A (No design completed)
- ☐ CODE B (Preliminary design)
- ☒ CODE C (Final design)
- ☐ OTHER (Specify)

DRAWING NO.:

ESTIMATOR: DEREMIAH

CHECKED BY:

SUMMARY	QUANTITY NO. UNITS	QUANTITY UNIT MEAS.	LABOR PER UNIT	LABOR TOTAL	MATERIAL PER UNIT	MATERIAL TOTAL	TOTAL COST
HOUSING - 4 BEDROOM UNIT							
22. ELECTRICAL SYSTEM							
a. Branch Circuits		LS	670	670.00	585	585.00	1255.00
b. Fixtures & Devices		LS	880	880.00	675	675.00	1555.00
c. Panel Boards	1	EA	160	160.00	185	185.00	345.00
d. Feeders	NONE			-		-	
e. Door Bell	1	EA	90	90.00	60.00	60.00	150.00
UBTOTAL							46,657.96
OVERHEAD (10%)							4,665.80
PROFIT (5%)							2,566.19
SUBTOTAL							53,889.95
BOND (1%)							538.90
TOTAL COST							54,428.85
TOTAL ROUNDED							54,500.00
BUILDING AREA:							
PRICE PER SF:							

ENG FORM 150
1 AUG 59

PREVIOUS EDITION MAY BE USED

CONSTRUCTION COST ESTIMATE

DATE PREPARED:

SHEET 31 OF 42

PROJECT: ALLENVILLE COMMUNITY DEVELOPMENT

LOCATION: ALLENVILLE, ARIZONA

ARCHITECT ENGINEER: NUMKENA ASSOCIATES

BASIS FOR ESTIMATE:
- ☐ CODE A (No design completed)
- ☐ CODE B (Preliminary design)
- ☒ CODE C (Final design)
- ☐ OTHER (Specify)

DRAWING NO.:

ESTIMATOR: DEREMIAH

CHECKED BY:

SUMMARY	QUANTITY NO. UNITS	QUANTITY UNIT MEAS.	LABOR PER UNIT	LABOR TOTAL	MATERIAL PER UNIT	MATERIAL TOTAL	TOTAL COST
COMMUNITY BUILDING							
1. EARTHWORK							
a. Machine Excavation	86	CY	5.00	430.00	12.00	1032.00	1462.00
b. Hand Excavation	12	CY	28.75	345.00	-		345.00
c. Backfill	15	CY	6.50	97.50	5.00	75.00	172.50
d. Cap. Water Barrier	77	CY	11.00	847.00	12.00	924.00	1771.00
e. Fine Grade	20,000	SF	.01	200.00	.01	200.00	400.00
2. FORMWORK							
a. Footing (Turndown)	340	SF	1.00	340.00	.75	255.00	595.00
b. Column	25	SF	1.50	37.50	.75	18.75	56.25
3. CONCRETE							
a. Footings	40		50.00	2000.00	62.00	2480.00	4480.00
b. Slab on Grade	77		50.00	3850.00	62.00	4774.00	8624.00
c. Column	1		65.00	65.00	62.00	62.00	127.00
d. Joints							
(1) Constr. Jt.	120		.20	24.00	.40	48.00	72.00
e. Finish							
(1) Float	590	SF	.12	70.80	.05	29.50	100.30
(2) Steel Trowel	5400	SF	.18	972.00	.05	270.00	1242.00
f. Cure and Protect	5990	SF	.06	359.40	.06	359.40	718.80
4. REINFORCING							
a. Mesh	590	SF	.09	53.10	.08	47.20	100.30
b. Bar	780	LB	.32	249.60	.26	202.80	452.40

NS FORM 150

CONSTRUCTION COST ESTIMATE

DATE PREPARED

PROJECT: ALLENVILLE COMMUNITY DEVELOPMENT

LOCATION: ALLENVILLE, ARIZONA

ARCHITECT ENGINEER: NUMKENA ASSOCIATES

BASIS FOR ESTIMATE
- ☐ CODE A (No design completed)
- ☐ CODE B (Preliminary design)
- ☒ CODE C (Final design)
- ☐ OTHER (Specify)

DRAWING NO.

ESTIMATOR: DEREMIAH

CHECKED BY

SUMMARY	QUANTITY NO. UNITS	QUANTITY UNIT MEAS.	LABOR PER UNIT	LABOR TOTAL	MATERIAL PER UNIT	MATERIAL TOTAL	TOTAL COST
COMMUNITY BUILDING							
5. ROUGH CARPENTRY							
a. Framing	6800	BF	.65	4420.00	.50	3400.00	7820.00
b. Sheathing							
(1) Plywood	6950	SF	.30	2085.00	.27	1876.50	3961.50
c. Trusses	5400	SF	.90	4860.00	1.52	8208.00	13,068.00
d. Wood Beams	180	BF	.75	135.00	.65	117.00	252.00
e. Hardbd Soffitts	NONE	SF	.30	-	.35	-	
6. MILLWORK							
a. Exterior Siding	6300	SF	.72	4536.00	.78	4914.00	9450.00
b. Exterior Trim	660	LF	.65	429.00	.50	330.00	759.00
c. Doors and Frames							
(1) Ext. (3^0 x 6^8)	9	EA	60.00	540.00	147	1323.00	1863.00
(2) Int. (2^8 x 6^8)	16	EA	68.00	1088.00	70.00	1120.00	2208.00
d. Cabinets							
Kitchen Cabinets	NONE	LF	40.00	-	98.00	-	
Closet Shelving	NONE	LF	3.00	-	3.00	-	
Linen Shelving	NONE	LF	2.00	-	2.00	-	
Sink Counters	36	LF	15.00	540.00	45.00	1620.00	2160.00
Storage Shelving	350	LF	2.00	700.00	1.50	525.00	1225.00
7. MASONRY	NONE						
8. STRUCTURAL STEEL	NONE						

ENG FORM 150

CONSTRUCTION COST ESTIMATE

DATE PREPARED:

SHEET 33 OF 42

PROJECT: ALLENVILLE COMMUNITY DEVELOPMENT

LOCATION: ALLENVILLE, ARIZONA

ARCHITECT ENGINEER: NUMKENA ASSOCIATES

BASIS FOR ESTIMATE:
- ☐ CODE A (No design completed)
- ☐ CODE B (Preliminary design)
- ☒ CODE C (Final design)
- ☐ OTHER (Specify)

DRAWING NO.:

ESTIMATOR: DEREMIAH

CHECKED BY:

SUMMARY	QUANTITY NO. UNITS	QUANTITY UNIT MEAS.	LABOR PER UNIT	LABOR TOTAL	MATERIAL PER UNIT	MATERIAL TOTAL	TOTAL COST
COMMUNITY BUILDING							
9. SHEET METAL							
a. Flashing	250	LF	.50	125.00	.65	162.50	287.50
b. Gutter	400	LF	.60	240.00	1.70	680.00	920.00
c. Downspout	96	LF	.75	72.00	2.70	259.20	331.20
10. ROOFING							
a. Metal Roofing	70	SQ	46.00	3220.00	51.00	3570.00	6790.00
11. LATH AND PLASTERING							
a. Gyp. Bd. Walls	800	SY	2.72	2176.00	2.46	1968.00	4144.00
b. Gyp. Bd. Ceilings	600	SY	2.72	1632.00	2.46	1476.00	3108.00
12. TILE WORK	1190		3.55	4224.50	2.20	2618.00	6842.50
13. METAL SASH							
a. Single Hung	196	SF	3.49	684.04	5.14	932.96	1617.00
b. Sliding	NONE	SF	3.49	-	4.76	-	
14. GLASS AND GLAZING (incl. under met sash)							
15. MISC. METALS	NONE			-		-	
16. PAINTING							
a. Exterior							
(1) Wd Siding, Trim	6150	SF	.15	922.50	.08	492.00	1414.50
(2) Hd Bd Soffitts	530	SF	.17	90.10	.12	63.60	153.70

CONSTRUCTION COST ESTIMATE

DATE PREPARED

SHEET 34 OF 42

PROJECT: ALLENVILLE COMMUNITY DEVELOPMENT

LOCATION: ALLENVILLE, ARIZONA

ARCHITECT ENGINEER: NUMKENA ASSOCIATES

BASIS FOR ESTIMATE
- ☐ CODE A (No design completed)
- ☐ CODE B (Preliminary design)
- ☒ CODE C (Final design)
- ☐ OTHER (Specify)

DRAWING NO.

ESTIMATOR: DEREMIAH

CHECKED BY

SUMMARY	QUANTITY NO. UNITS	QUANTITY UNIT MEAS.	LABOR PER UNIT	LABOR TOTAL	MATERIAL PER UNIT	MATERIAL TOTAL	TOTAL COST
COMMUNITY BUILDING							
16. PAINTING (cont'd)							
b. Interior							
(1) Gyp Bd	12,600	SF	.15	1890.00	.08	1008.00	2898.00
(2) Doors	25	EA	21.00	525.00	7.00	175.00	700.00
17. FLOOR COVERING							
a. Vinyl Asbestos Tile	3600	SF	.44	1584.00	.37	1332.00	2916.00
b. Carpet	200	SY	6.00	1200.00	8.00	1600.00	2800.00
18. THERMAL INSULATION							
a. Attic	5400	SF	.14	756.00	.38	2052.00	2808.00
b. Walls	6150	SF	.14	861.00	.15	922.50	1783.50
19. FINISH HARDWARE							
a. Door Hardware		LS	1400	1400.00	1820	1820.00	3220.00
b. Toilet Accessories		LS	300	300.00	500	500.00	800.00
c. Toilet Compartments	3	EA	100	300.00	180	540.00	840.00
d. Folding Doors		LS	1300	1300.00	3600	3600.00	4900.00
20. MECHANICAL SYSTEMS							
a. Electric Heater	5	EA	220	1100.00	175	875.00	1975.00
b. Evaporative Cooler	6	EA	320	1920.00	550	3300.00	5220.00
c. Ductwork		LS	3375	3375.00	3375	3375.00	6750.00
d. Controls		LS	350	350.00	350	350.00	700.00
. PLUMBING							
a. Fixtures	13	EA	120	1560.00	180	2340.00	3900.00
b. Piping		LS	3390	3390.00	2800	2800.00	6190.00
c. Hot Water Heater	1	EA	300	300.00	350	350.00	650.00

CONSTRUCTION COST ESTIMATE

DATE PREPARED

PROJECT: ALLENVILLE COMMUNITY DEVELOPMENT

LOCATION: ALLENVILLE, ARIZONA

ARCHITECT ENGINEER: NUMKENA ASSOCIATES

BASIS FOR ESTIMATE

- ☐ CODE A (No design completed)
- ☐ CODE B (Preliminary design)
- ☒ CODE C (Final design)
- ☐ OTHER (Specify)

DRAWING NO.

ESTIMATOR

CHECKED BY

SUMMARY	QUANTITY NO. UNITS	QUANTITY UNIT MEAS.	LABOR PER UNIT	LABOR TOTAL	MATERIAL PER UNIT	MATERIAL TOTAL	TOTAL COST
COMMUNITY BUILDING							
22. KITCHEN EQUIPMENT		LS	6500	6500.00	18900	18900.00	25,400.00
23. ELECTRICAL SYSTEM							
a. Branch Circuits		LS	7425	7425.00	6075	6075.00	13,500.00
b. Fixtures & Devices		LS	9600	9600.00	6400	6400.00	
c. Panel Boards		LS	1050	1050.00	1120	1120.00	2170.00
d. Feeders		LS	550	550.00	486	486.00	1036.00
24. FIRE ALARM		LS	2300	2300.00	1800	1800.00	4100.00
SUBTOTAL							184,524.95
OVERHEAD (10%)							18,452.50
SUBTOTAL							202,977.45
PROFIT (5%)							10,148.87
SUBTOTAL							213,126.32
BOND (1%)							2131.26
TOTAL COST							215,247.58
TOTAL ROUNDED							216,000.00
BUILDING AREA: 5400 SF							
PRICE PER SF: 40.00							

CONSTRUCTION COST ESTIMATE	DATE PREPARED	SHEET 36 OF 42

PROJECT: ALLENVILLE COMMUNITY DEVELOPMENT

LOCATION: ALLENVILLE, ARIZONA

ARCHITECT ENGINEER: NUMKENA ASSOCIATES

BASIS FOR ESTIMATE
- ☐ CODE A (No design completed)
- ☐ CODE B (Preliminary design)
- ☒ CODE C (Final design)
- ☐ OTHER (Specify)

DRAWING NO.

ESTIMATOR: DEREMIAH

CHECKED BY

SUMMARY	QUANTITY NO. UNITS	QUANTITY UNIT MEAS.	LABOR PER UNIT	LABOR TOTAL	MATERIAL PER UNIT	MATERIAL TOTAL	TOTAL COST
PARK AND COMMUNITY COMPLEX AMENITIES							
1. LANDSCAPING AND IRRIGATION							
a. Trees (20 in. box)	100	EA	103	10,300.00	103	10,300.00	20,600.00
b. Turf	516,186	SF	.04	20,647.44	.06	30,971.16	51,618.60
c. Irrigation System		LS	29,200	29,200.00	23,300	23,300.00	52,500.00
2. CONCRETE PAVING	5440	SF	1.25	6,800.00	1.25	6,800.00	13,600.00
3. PICNIC TABLES	6	EA	296	1,776.00	256	1,536.00	3,312.00
4. EQUIPMENT							
a. Barbecues	4	EA	80	320.00	160	640.00	960.00
b. Softball Backstop	1	EA	1800	1,800.00	5,100	5,100.00	6,900.00
c. Play Structure	1	EA	7800	7,800.00	14,200	14,200.00	22,000.00
d. Basketball Backstops	2	EA	400	800.00	700	1,400.00	2,200.00
SUBTOTAL							173,690.60
OVERHEAD (12%)							20,842.87
SUBTOTAL							194,533.47
PROFIT (5%)							9,726.67
SUBTOTAL							204,260.14
BOND (1%)							2,042.60
TOTAL COST							206,302.74
TOTAL ROUNDED							206,300.00

CONSTRUCTION COST ESTIMATE	DATE PREPARED	SHEET 37 OF 42

PROJECT: ALLENVILLE COMMUNITY DEVELOPMENT

LOCATION: ALLENVILLE, ARIZONA

ARCHITECT ENGINEER: NUMKENA ASSOCIATES

BASIS FOR ESTIMATE
- ☐ CODE A (No design completed)
- ☐ CODE B (Preliminary design)
- ☒ CODE C (Final design)
- ☐ OTHER (Specify)

DRAWING NO.

ESTIMATOR: DEREMIAH

CHECKED BY

SUMMARY	QUANTITY NO. UNITS	QUANTITY UNIT MEAS.	LABOR PER UNIT	LABOR TOTAL	MATERIAL PER UNIT	MATERIAL TOTAL	TOTAL COST
RAMADA BUILDINGS W/DRINKING FOUNTAIN							
1. EARTHWORK							
a. Machine Excavation	20	CY	5.00	100.00	12.00	240.00	340.00
b. Hand Excavation	10	CY	28.75	287.50	-		287.50
c. Backfill	8	CY	6.50	52.00	5.00	40.00	92.00
d. Capillary Barrier	12	CY	11.00	132.00	12.00	144.00	276.00
e. Fine Grade	1500	SF	.03	45.00	.03	45.00	90.00
2. FORMWORK							
a. Screeds	110	SF	1.00	110.00	.75	82.50	192.50
3. CONCRETE							
a. Footings	12	CY	50.00	600.00	62.00	744.00	1344.00
b. Slab on Grade	9	CY	50.00	450.00	62.00	558.00	1008.00
c. Joints							
(1) Exp. Joint	24	LF	.20	4.80	.40	9.60	14.40
d. Finish							
(1) Steel Trowel	720	SF	.18	129.60	.05	36.00	165.60
e. Cure and Protect	720	SF	.06	43.20	.06	43.20	86.40
f. Prestressed Single Tees	720	SF	3.00	2160.00	6.50	4680.00	6840.00
g. Prestressed Beams	44	LF	10.00	440.00	25.00	1100.00	1540.00
4. REINFORCING							
a. Mesh	720	SF	.09	64.80	.08	57.60	122.40
b. Bar	400	LB	.32	128.00	.26	104.00	232.00
5. MASONRY							
a. CMU (slump)	165	SF	4.50	742.50	4.00	660.00	1402.50

CONSTRUCTION COST ESTIMATE	DATE PREPARED	SHEET 38 OF 42

PROJECT: ALLENVILLE COMMUNITY DEVELOPMENT

LOCATION: ALLENVILLE, ARIZONA

ARCHITECT ENGINEER: NUMKENA ASSOCIATES

BASIS FOR ESTIMATE
- ☐ CODE A (No design completed)
- ☐ CODE B (Preliminary design)
- ☒ CODE C (Final design)
- ☐ OTHER (Specify)

DRAWING NO.

ESTIMATOR: DEREMIAH

CHECKED BY

SUMMARY	QUANTITY NO. UNITS	QUANTITY UNIT MEAS.	LABOR PER UNIT	LABOR TOTAL	MATERIAL PER UNIT	MATERIAL TOTAL	TOTAL COST
RAMADA BUILDINGS W/DRINKING FOUNTAIN							
6. PAINTING		LS					
7. PLUMBING							
a. Fixtures	1	EA	150	150.00	230	230.00	380.00
b. Piping			540	540.00	520	520.00	1060.00
8. ELECTRICAL SYSTEM							
a. Branch Circuit		LS	260	260.00	220	220.00	480.00
b. Fixtures and Devices		LS	320	320.00	240	240.00	560.00
SUBTOTAL							16,513.30
OVERHEAD (12%)							1981.60
SUBTOTAL							18,494.90
PROFIT (08%)							1479.59
SUBTOTAL							19,974.49
BOND (1%)							199.74
TOTAL COST (1 BLDG.)							20,174.23
TOTAL ROUNDED (2 BLDGS.)				(2 @ 20,200)			40,400.00
BUILDING AREA (2) 1440 SF							
PRICE PER SF 28.05							

DETAIL SUMMARY SHEET OF REASONABLE CONTRACT ESTIMATE

Prepared by: J. Murphy
Checked by: R. Stadler **Date:** 12/21/79

Sheet 39 of 42

Project: ALLENVILLE COMMUNITY DEVELOPMENT

Bid Item No.	Designation	Unit	Quantity	Unit cost	Adjusted Unit cost	Adjusted Amount
1	Earthwork:					
	a. Clearing and Grubbing	Ac.	55	400.00		22,000
	b. Top Soil Removal	CY	8,000	2.00		16,000
	c. Excavation	CY	18,400	2.00		36,800
	d. Finished Grading	SY	197,000	.25		49,250
						124,050
2	Utility Trenching:					
	a. Electrical & Telephone	LF	9,500	2.00		19,000
3	Utilities:					
	a. Mobile Home Pedestals, including Concrete	Ea.	20	1,000.00		20,000
4	Drainage Structures:					
	a. Headwalls (2)					
	Formed Concrete	CY	4.6	450.00		2,070
	Reinforcing Steel	Lbs	230	1.20		276
	b. Trash Rack	Ea.	1	200.00		200
	c. Concrete Spillways	SF	850	4.00		3,400
	d. Rip Rap	SY	80	10.00		800
						6,746

Form No R-2

Cost information for this estimate was obtained from 30-day old Contractor quotations on a similar project in Maricopa County and on telephone calls to numerous Contractors to obtain their latest unit costs.

DETAIL SUMMARY SHEET OF REASONABLE CONTRACT ESTIMATE

Prepared by: J. Murphy
Checked by: R. Stadler **Date:** 12/21/79

Sheet 40 of 42

Project: ALLENVILLE COMMUNITY DEVELOPMENT

Bid Item				Unit cost	Adjusted	
No.	Designation	Unit	Quantity		Unit cost	Amount
5	Sanitary System:					
	a. Mobile Home 960 gallon					
	septic tank & leach bed	Ea.	20	1,900.00		38,000
	b. Residential 1200 gallon					
	septic tank & leach bed	Ea	36	2,100.00		75,600
						113,600
6	Water Supply:					
	a. Well	LS	1	32,500.00		32,500
	b. 100,000 gal. reservois	LS	1	40,000.00		40,000
	c. 1000 gal. Hydro. tank	LS	1	1,200.00		1,200
	d. Gate valve	Ea.	10	500.00		5,000
	e. Check valve	Ea.	4	700.00		2,800
	f. 250 gpm pump	Ea.	1	3,000.00		3,000
	g. 100 gpm pump (well)	Ea.	1	10,000.00		10,000
	h. 60 gpm pump	Ea.	2	1,500.00		3,000
	i. Piping	LS	LS	20,000.00		20,000
	j. Fencing	If	834	8.50		7,100
						124,600

Cost information for this estimate was obtained from 30-day old Contractor quotations on a similar project in Maricopa County and on telephone calls to numerous Contractors to obtain their latest unit costs.

Form No R-2

DETAIL SUMMARY SHEET OF REASONABLE CONTRACT ESTIMATE

Prepared by: J. Murphy
Checked by: R. Stadler **Date:** 12/21/79

Sheet 41 of 42

Project: ALLENVILLE COMMUNITY DEVELOPMENT

Bid Item No.	Designation	Unit	Quantity	Unit cost	Adjusted Unit cost	Adjusted Amount
7	Water Distribution System:					
	a. 8" line	LF	3,730	10.50		39,165
	b. 6" line	LF	3,000	8.50		25,500
	c. 4" line	LF	1,970	7.75		15,268
	d. 2" line	LF	930	6.50		6,045
	e. Fire Hydrant	Ea.	9	1,200.00		10,800
	f. 8" valves	Ea.	7	350.00		2,450
	g. 6" valves	Ea.	9	250.00		2,250
	h. 4" valves	Ea.	10	200.00		2,000
	i. 2" valves	Ea.	2	150.00		300
	j. Valve box	Ea.	28	100.00		2,800
	k. Service Tape and Meter	Ea.	58	350.00		20,300
						126,878
8	Paving:					
	a. Subgrade preparation	SY	31,030	3.00		93,090
	b. Aggregate Base (6")	Tn	9,210	9.00		82,890
	c. Prime Coat	Tn	65	200.00		13,000
	d. Asphaltic Concrete	Tn	3,200	25.00		80,000
						268,980

Cost information for this estimate was obtained from 30-day old Contractor quotations on a similar project in Maricopa County and on telephone calls to numerous Contractors to obtain their latest unit cost.

Form No R-2

DETAIL SUMMARY SHEET OF REASONABLE CONTRACT ESTIMATE

Prepared by: J. Murphy
Checked by: R. Stadler **Date:** 12/21/79

Sheet 42 of 42

Project: ALLENVILLE COMMUNITY DEVELOPMENT

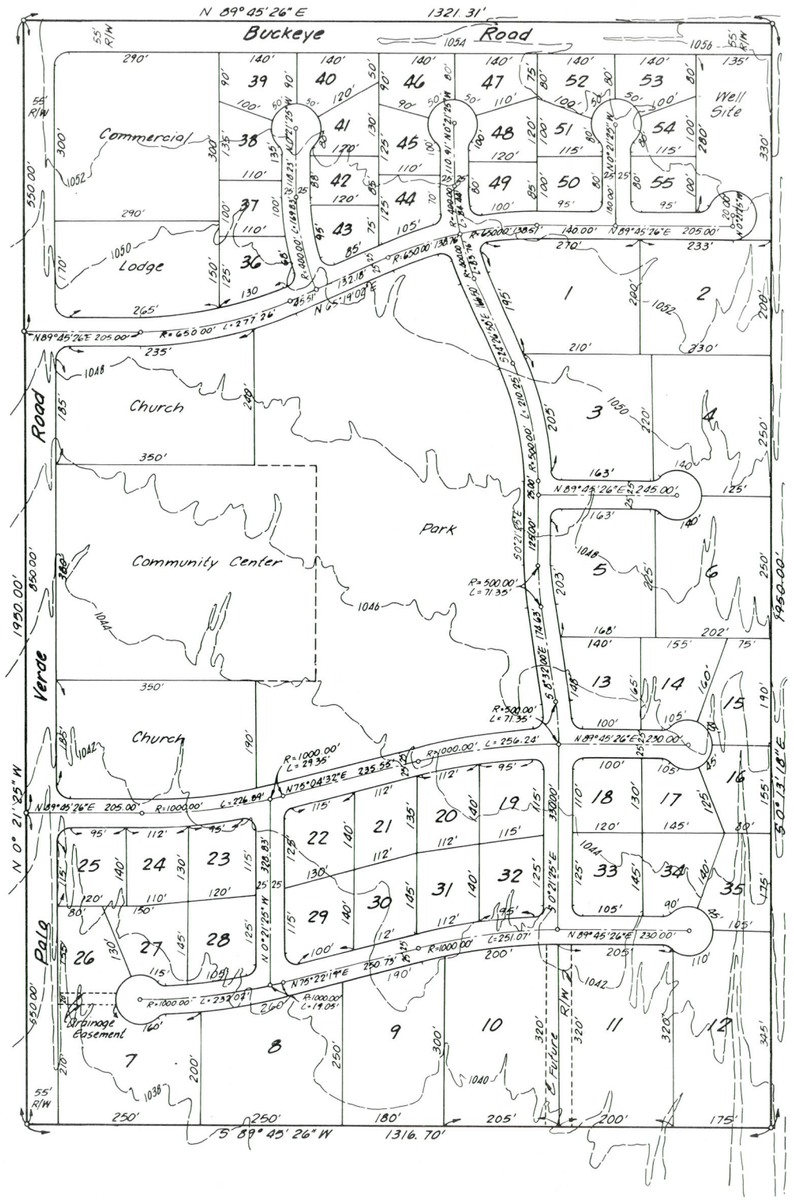
Bid Item No.	Designation	Unit	Quantity	Unit cost	Adjusted Unit cost	Adjusted Amount
9	Concrete:					
	a. Subgrade preparation	SY	3,670	3.00		11,010
	b. 4" roll curb	LF	8,400	7.50		63,000
	c. 6" vertical curb	LF	3,275	9.00		29,475
	d. Valley gutter	SF	924	4.00		3,696
	e. Apron pads	Ea	30	98.00		2,940
	f. Aprons	SF	3,400	4.00		13,600
	g. 4' Sidewalk	SF	9,680	3.00		29,040
	h. Mobile home pads	SF	8,000	3.00		24,000
						176,761
10	Driveways:					
	a. Subgrade preparation	SY	2,140	3.50		7,490
	b. Aggregate Base (4")	Tn	440	9.00		3,960
	c. Prime Coat	Tn	4	200.00		800
	d. Asphaltic concrete	Tn	150	25.00		3,750
						16,000
						996,615
	SUBTOTAL - Site and Utilities (Civil)					996,615
	Allowance to midpoint of Const. (15%)					149,442
	TOTAL - Site and Utilities (Civil)					1,146,057

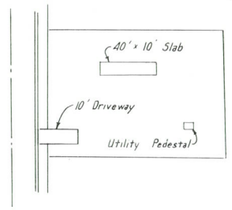
Cost information for this estimate was obtained from 30-day old Contractor quotations on a similar project in Maricopa County and on telephone calls to numerous Contractors to obtain their latest unit costs.

Form No R-2

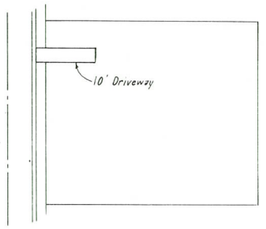
100 50 0 50 100 150 200

Graphic Scale

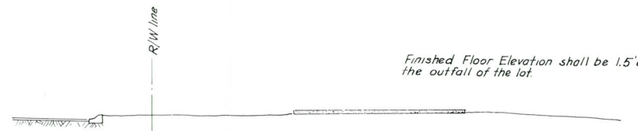




Typical Mobile Home Lot



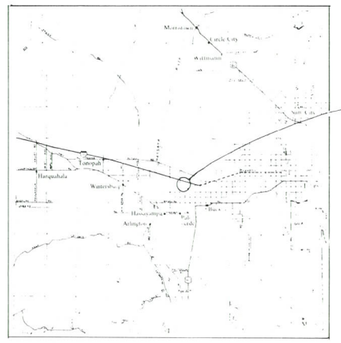
Typical Residential Lot



Finished Floor Elevation shall be 1.5' above the outfall of the lot.

House pad to be graded to an elevation one foot above the outfall of the lot.

Typical Cross-Section



VICINITY MAP

SYMBOL	DESCRIPTIONS	DATE	APPROVAL
	REVISIONS		

PHOENIX ENGINEERING
6868 N. 7TH. AVE., PHX., AZ 85013
(602) 264-4540

U. S. ARMY ENGINEER DISTRICT
LOS ANGELES
CORPS OF ENGINEERS

DESIGNED BY: J.M.
DRAWN BY: J.W
CHECKED BY: R.S.

ALLENVILLE COMMUNITY DEVELOPMENT
PRELIMINARY
SITE PLAN

SUBMITTED BY: ____ DATE APPROVED: ____
CHIEF ____ BRANCH

SPEC. NO. DACW09-____-B-____
DISTRICT FILE NO.

SHEET C1

N

100 50 0 50 100 150 200

Graphic Scale

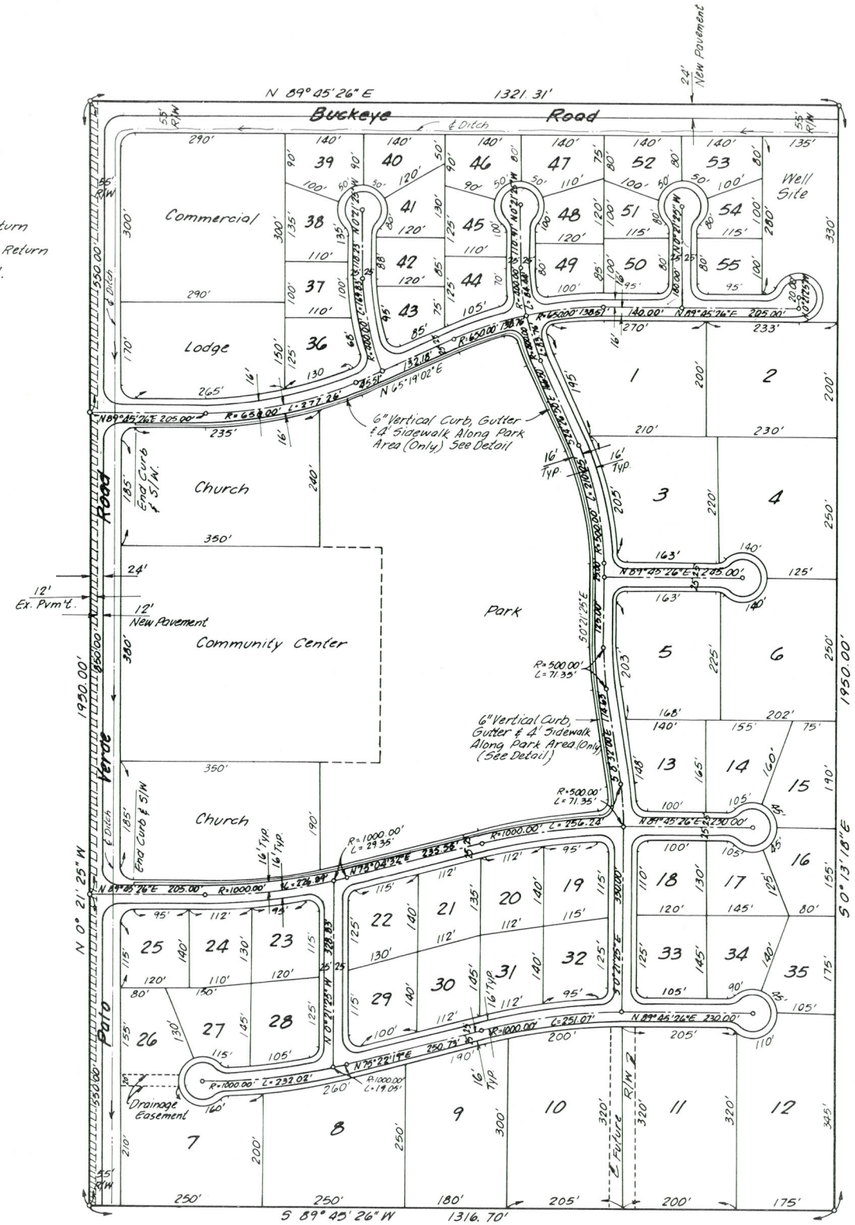
LEGEND

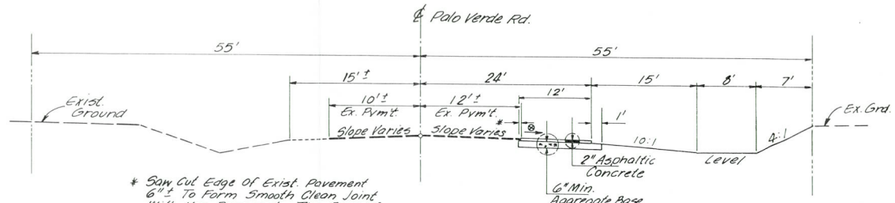
New Pavement

Exist. Pavement

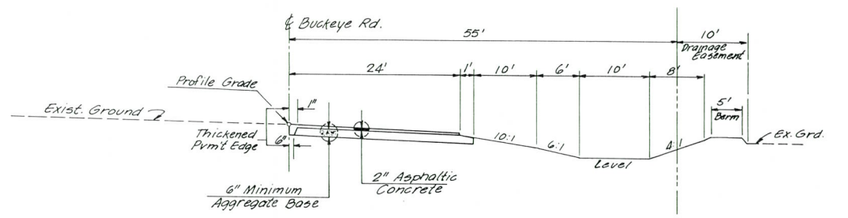
Ditch ℄

Notes:
1. Major Streets To Have Return Radii Of 30'.
2. Residential Streets To Have Return Radii Of 25'.
3. Cul-De-Sac Radii To Be 34'.

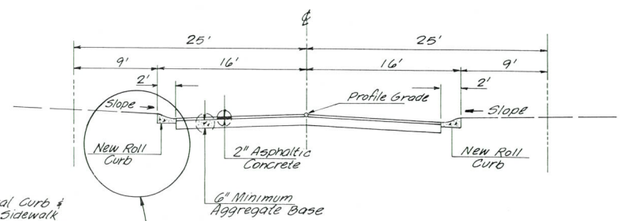




TYPICAL SECTION
East Half Of Palo Verde Road

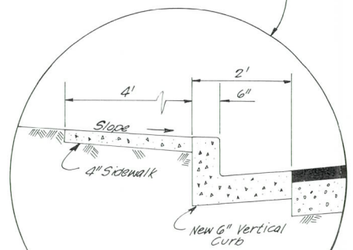


TYPICAL SECTION
South Half Of Buckeye Road



Note: 6" Vertical Curb & Gutter And 4' Sidewalk To Replace Roll Curb In Those Areas Adjacent To The Park, Only.

TYPICAL SECTION
Residential Streets



TYPICAL SECTION
6" Vertical Curb, Gutter & 4' Sidewalk

SYMBOL	DESCRIPTIONS	DATE	APPROVAL
	REVISIONS		

PHOENIX ENGINEERING
6868 N. 7TH. AVE., PHX., AZ 85013
(602) 264-4540

U. S. ARMY ENGINEER DISTRICT
LOS ANGELES
CORPS OF ENGINEERS

DESIGNED BY: J.M.
DRAWN BY: J.W.
CHECKED BY: R.S.

ALLENVILLE COMMUNITY DEVELOPMENT
PRELIMINARY
PAVING PLAN

SUBMITTED BY: CHIEF, BRANCH
DATE APPROVED:
SPEC. NO. DACW09-____-B-____
DISTRICT FILE NO.
SHEET C2

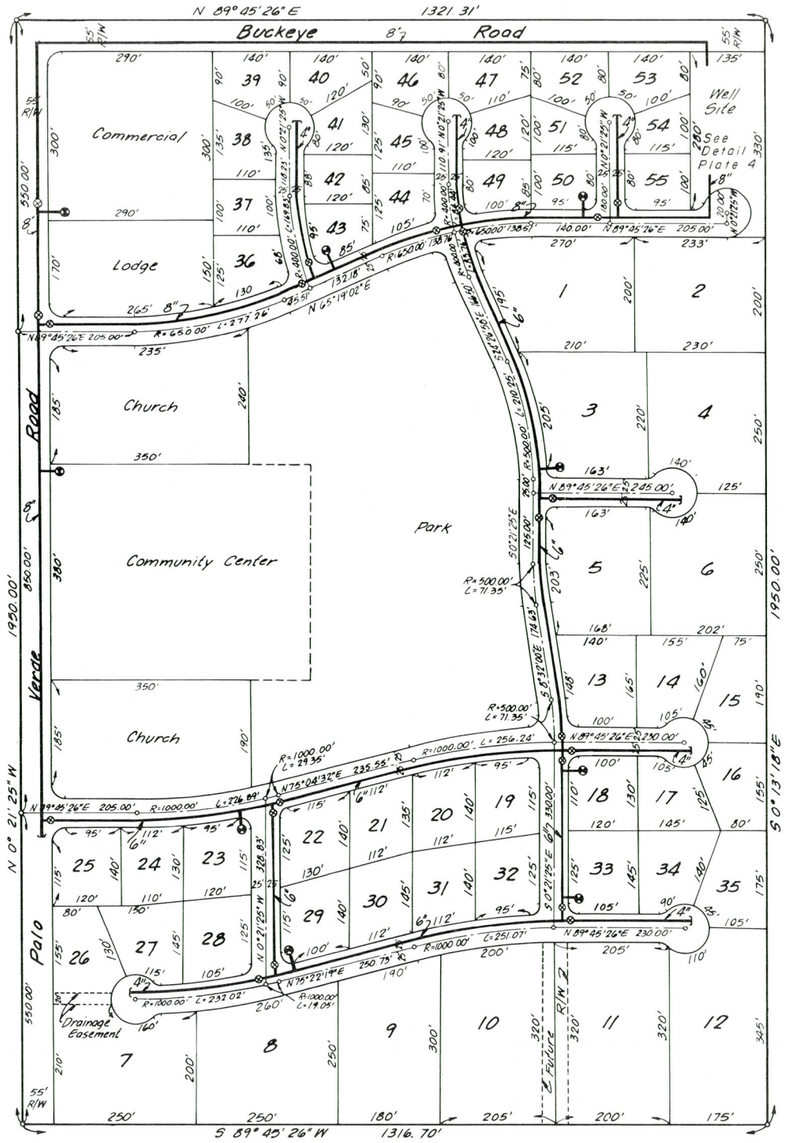
N

100 50 0 50 100 150 200

Graphic Scale

LEGEND

- 6" — New Water Line (Size As Shown)
- Valve
- Fire Hydrant
- Cap Or Plug



SYMBOL	DESCRIPTIONS	DATE	APPROVAL
	REVISIONS		

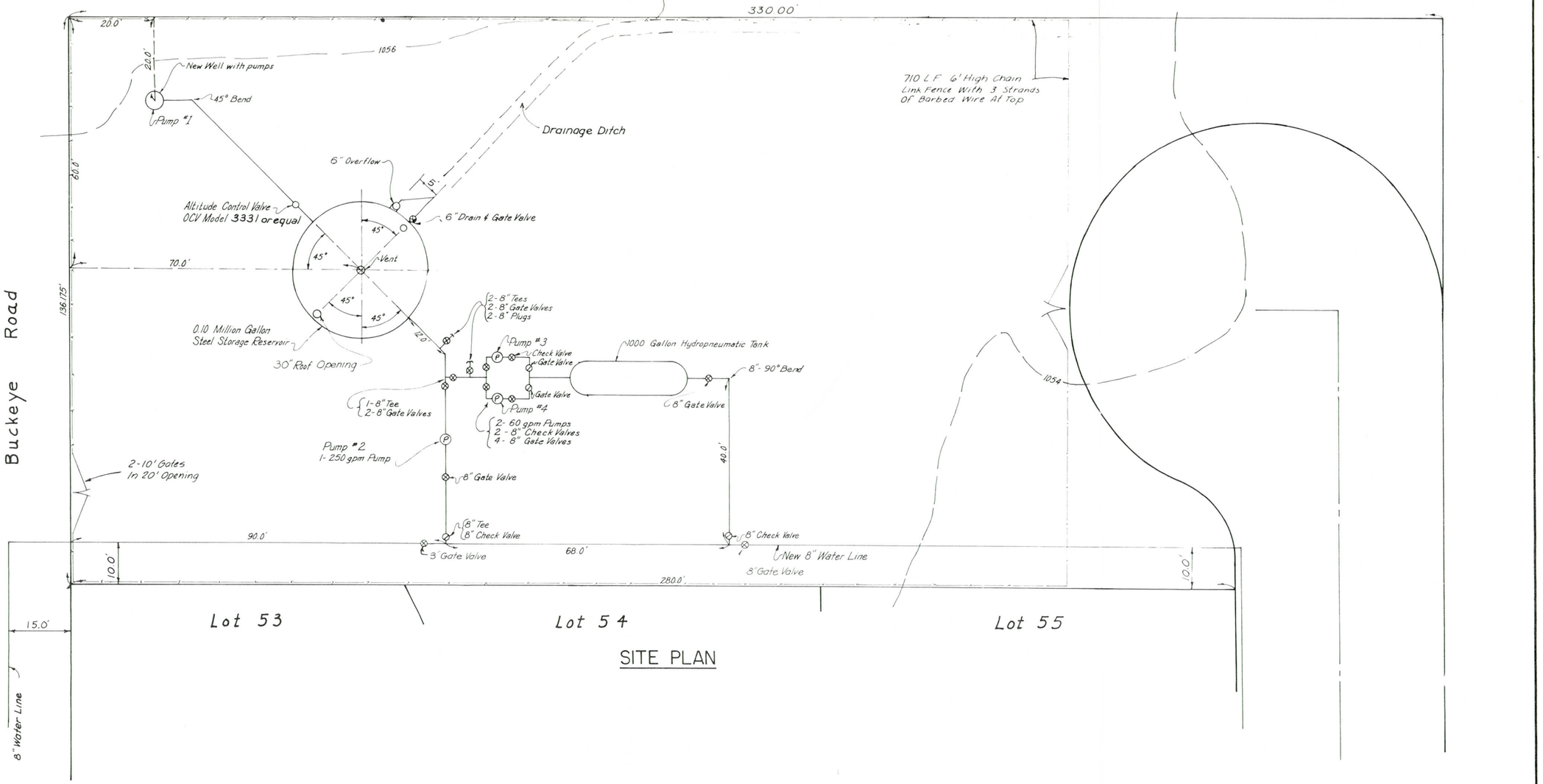
PHOENIX ENGINEERING
6868 N. 7TH. AVE., PHX., AZ 85013
(602) 264-4540

U. S. ARMY ENGINEER DISTRICT
LOS ANGELES
CORPS OF ENGINEERS

DESIGNED BY: J.M.
DRAWN BY: J.W.
CHECKED BY: R.S.

ALLENVILLE COMMUNITY DEVELOPMENT
PRELIMINARY
WATER DISTRIBUTION SYSTEM

SUBMITTED BY: CHIEF, BRANCH
DATE APPROVED:
SPEC. NO. DACW09-____-B-____
DISTRICT FILE NO.
SHEET C3



SITE PLAN

N

0 10' 20' 30'

1"=10'

SYMBOL	DESCRIPTIONS	DATE	APPROVAL

REVISIONS

NUMKENA ASSOCIATES
4105 N. 20TH STREET
PHOENIX, ARIZONA 85016
(602)-279-6973

U. S. ARMY ENGINEER DISTRICT
LOS ANGELES
CORPS OF ENGINEERS

DESIGNED BY:
DRAWN BY:
CHECKED BY:

ALLENVILLE COMMUNITY DEVELOPMENT

WATER SUPPLY SITE PLAN

SUBMITTED BY: DATE APPROVED:

CHIEF, BRANCH

SPEC. NO. DACW 09- ____ B- ____

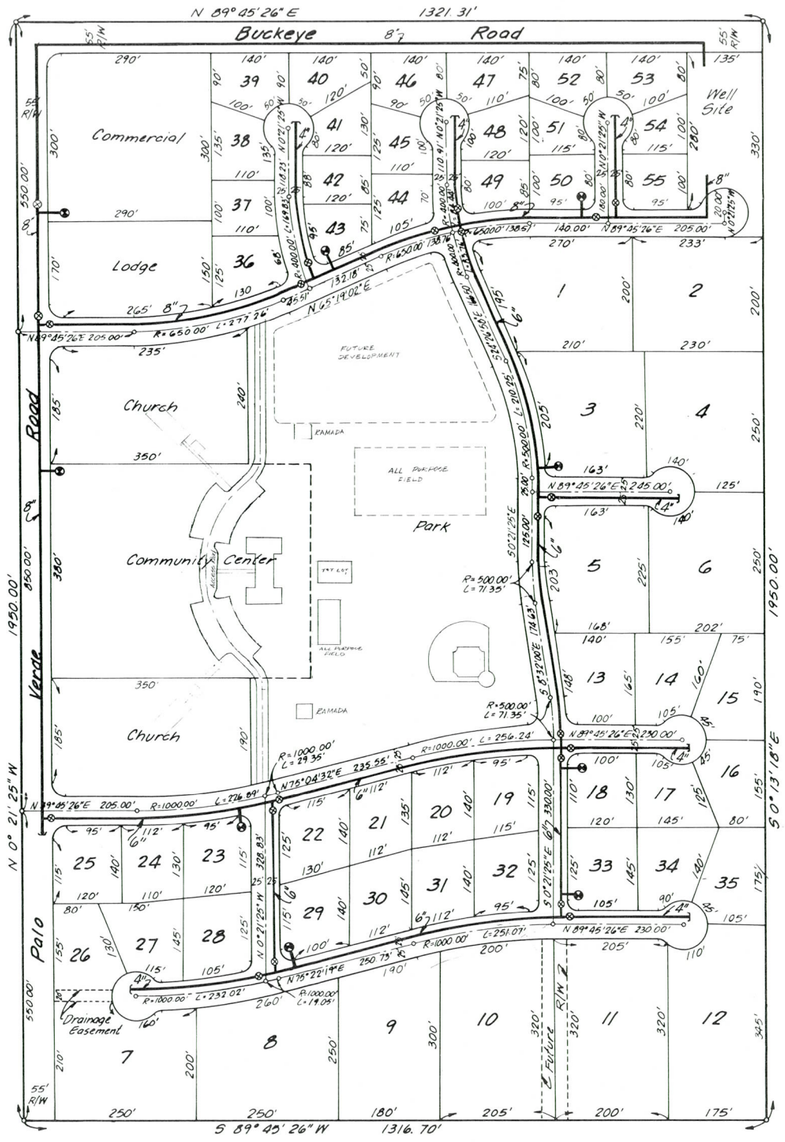
DISTRICT FILE NO.

SHEET CW-5 OF 6 SHEETS

N

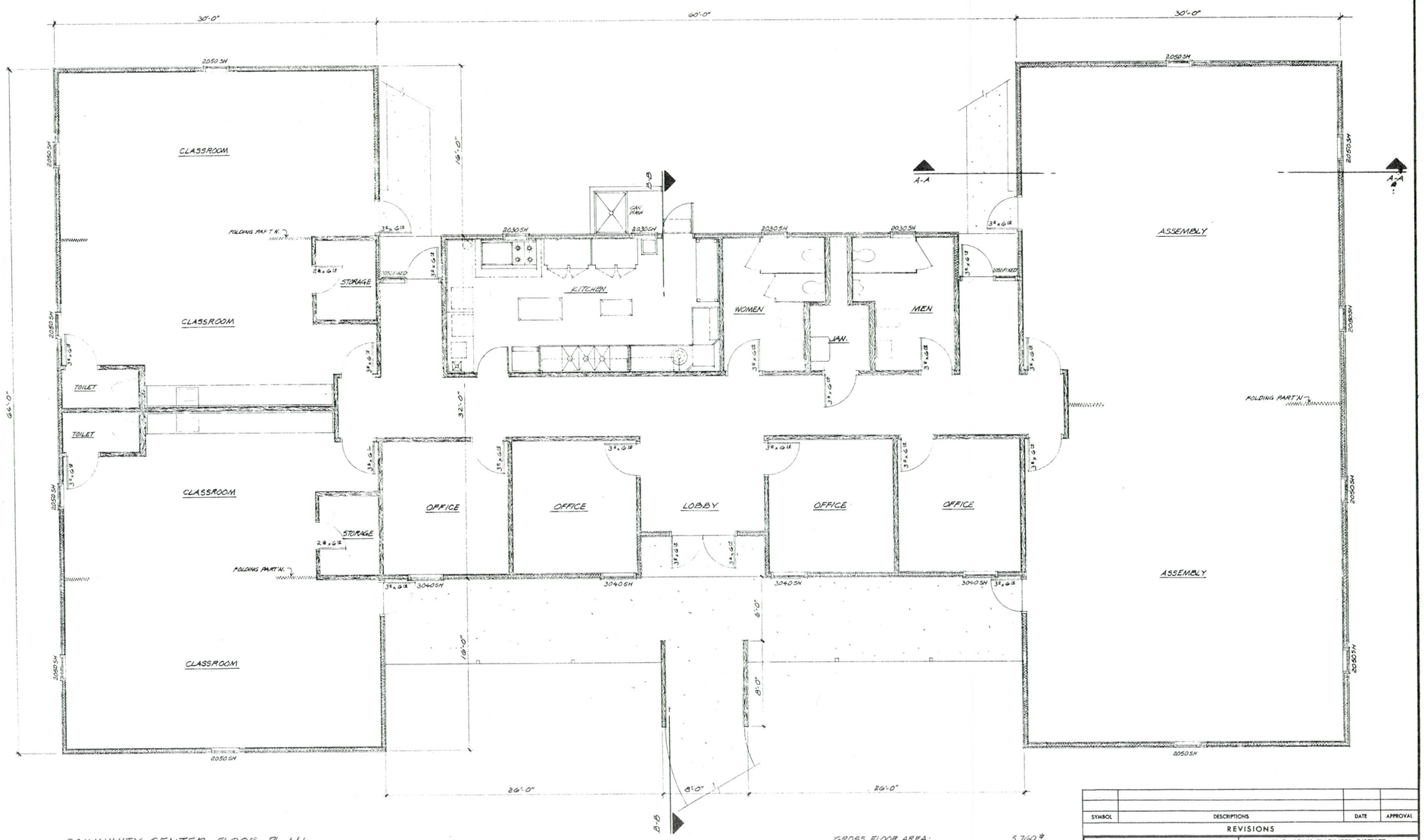
100 50 0 50 100 150 200

Graphic Scale



SYMBOL	DESCRIPTIONS	DATE	APPROVAL
	REVISIONS		

NUMKENA ASSOCIATES, INC.	U. S. ARMY ENGINEER DISTRICT LOS ANGELES CORPS OF ENGINEERS
DESIGNED BY: DCN DRAWN BY: DCM CHECKED BY: JRD	PRELIMINARY DESIGN ALLENVILLE COMMUNITY DEVELOPMENT ARCHITECTURAL SITE PLAN
SUBMITTED BY: _____ CHIEF, _____ BRANCH DATE APPROVED:	SPEC. NO. DACW09-____-B-____ DISTRICT FILE NO.
	SHEET A1



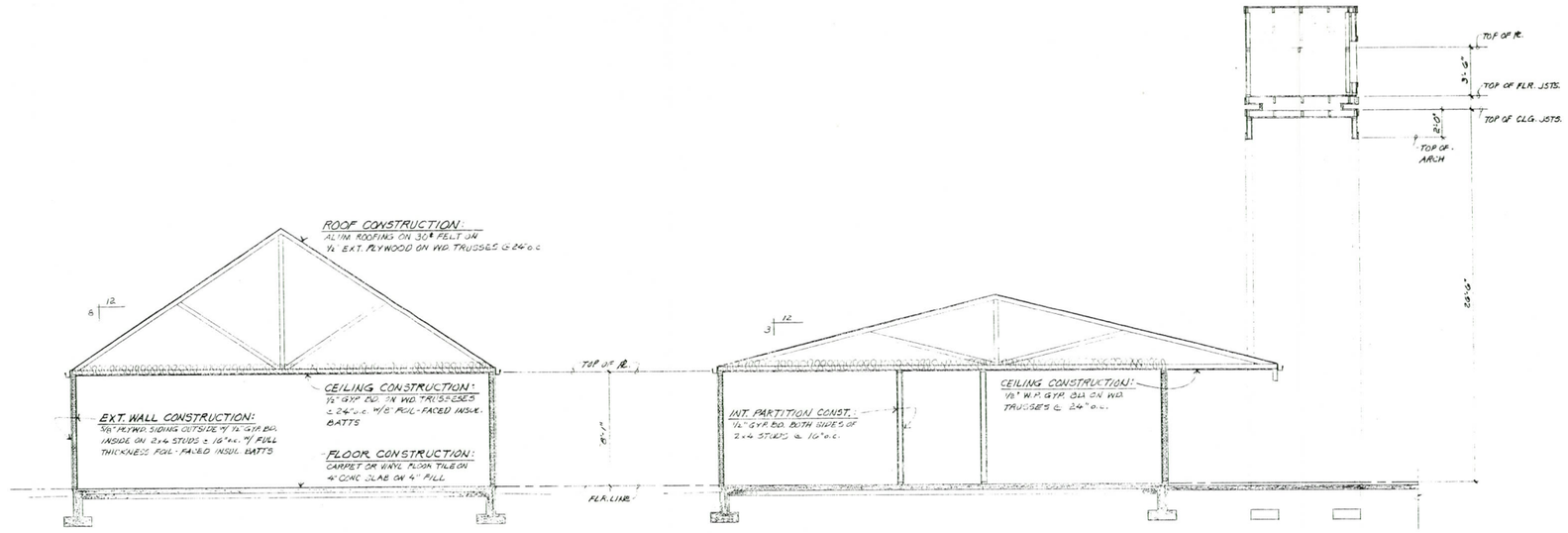
COMMUNITY CENTER FLOOR PLAN

GROSS FLOOR AREA: 5,760 #

SYMBOL	DESCRIPTIONS	DATE	APPROVAL

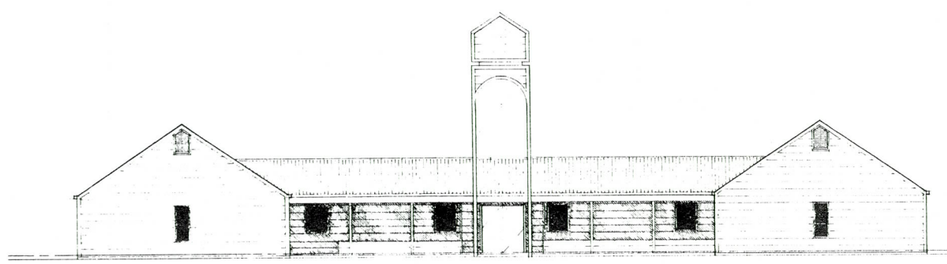
REVISIONS

NIMKENA ASSOCIATES, INC.	U. S. ARMY ENGINEER DISTRICT LOS ANGELES CORPS OF ENGINEERS
DESIGNED BY: DCN DRAWN BY: PD CHECKED BY: JRD	PRELIMINARY DESIGN ALLENVILLE COMMUNITY DEVELOPMENT FLOOR PLAN COMMUNITY CENTER
SUBMITTED BY: _____ CHIEF, BRANCH DATE APPROVED: _____	SPEC. NO. DACW 09-____ B-____ DISTRICT FILE NO.
	SHEET A2

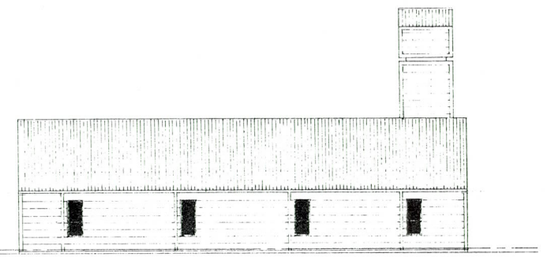


SECTION A-A

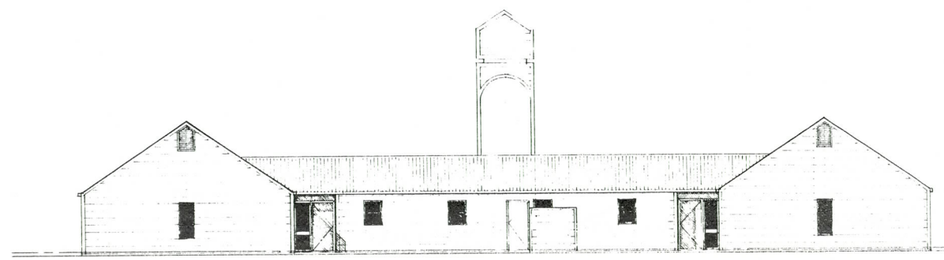
SECTION B-B



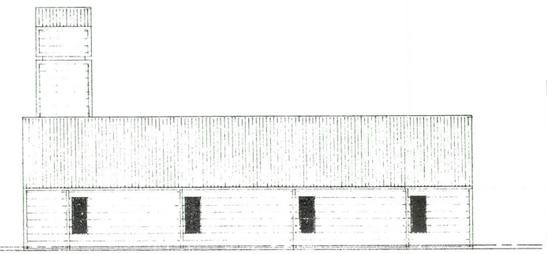
FRONT ELEVATION



LEFT ELEVATION



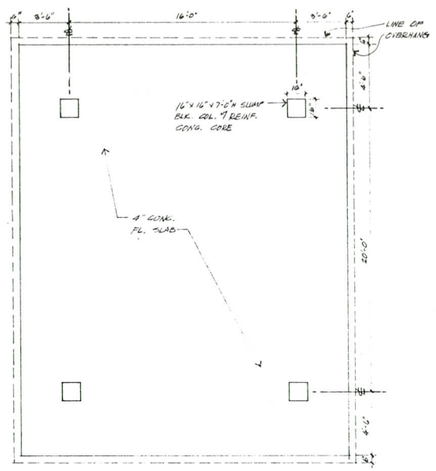
REAR ELEVATION



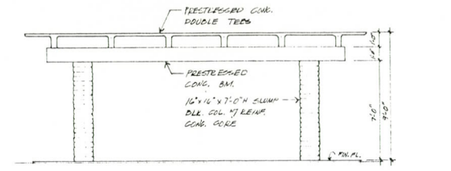
RIGHT ELEVATION

SYMBOL	DESCRIPTIONS	DATE	APPROVAL
	REVISIONS		

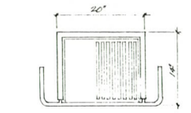
NUMKENA ASSOCIATES, INC.	U. S. ARMY ENGINEER DISTRICT LOS ANGELES CORPS OF ENGINEERS
DESIGNED BY: DCN DRAWN BY: PD CHECKED BY: JRD	PRELIMINARY DESIGN ALLENVILLE COMMUNITY DEVELOPMENT EXTERIOR ELEVATIONS & BUILDING SECTIONS COMMUNITY CENTER
SUBMITTED BY: _____ CHIEF, BRANCH DATE APPROVED:	SPEC. NO. DACW09-____ B-____ DISTRICT FILE NO.
	SHEET A3



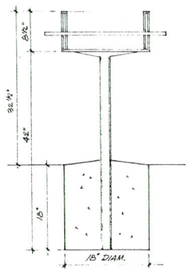
RAMADA FLOOR PLAN



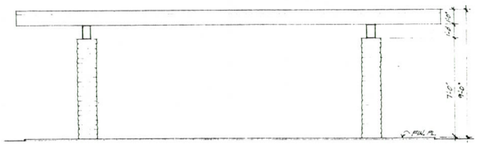
END ELEV.



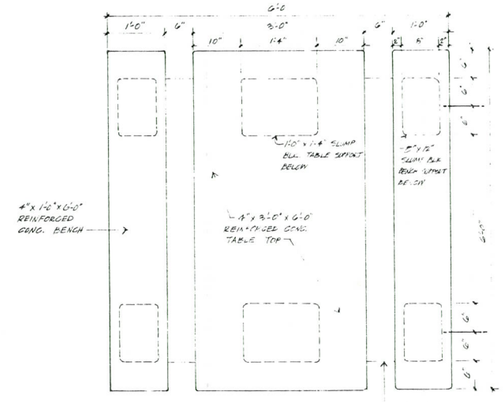
COOKING GRILL - TOP VIEW



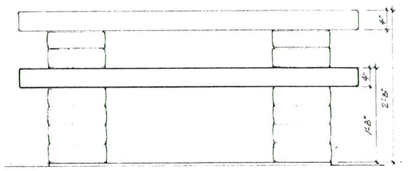
COOKING GRILL - FRONT VIEW



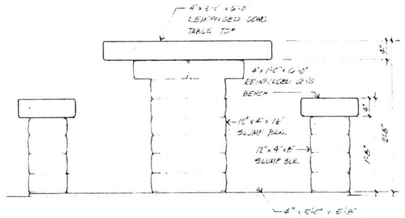
SIDE ELEV.



PICNIC TABLE PLAN



SIDE ELEV.



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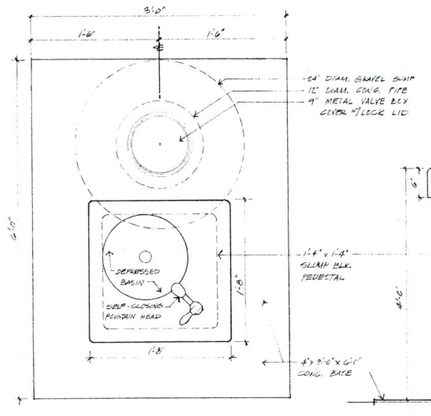


WATER FOUNTAIN PLAN

END ELEVATION

SYMBOL	DESCRIPTIONS	DATE	APPROVAL
	REVISIONS		

NUMKENA ASSOCIATES, INC.

U. S. ARMY ENGINEER DISTRICT
LOS ANGELES
CORPS OF ENGINEERS

DESIGNED BY: JRD
DRAWN BY: PD
CHECKED BY: JD

PRELIMINARY DESIGN

ALLENVILLE COMMUNITY DEVELOPMENT

PARK IMPROVEMENTS

SUBMITTED BY: _____ CHIEF, _____ BRANCH

DATE APPROVED: _____

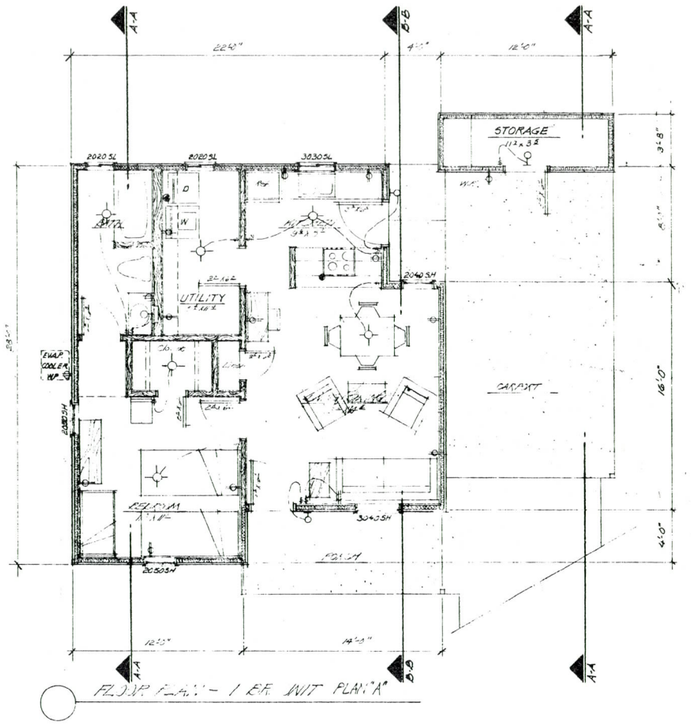
SPEC. NO. DACW09-____-B-____

DISTRICT FILE NO.

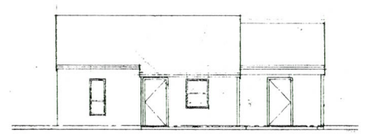
SHEET A4


1 BDRM.
PLAN 'A'
ELEVATION "A"

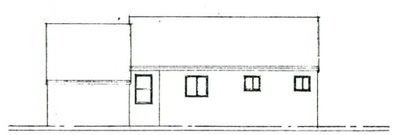
1 BDRM.
PLAN 'A'
ELEVATION "B"



FLOOR PLAN - 1 BEDROOM UNIT PLAN "A"

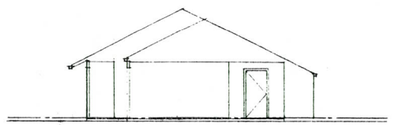


RIGHT ELEVATION

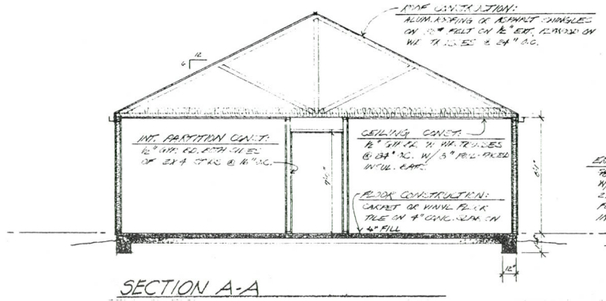


REAR ELEVATION

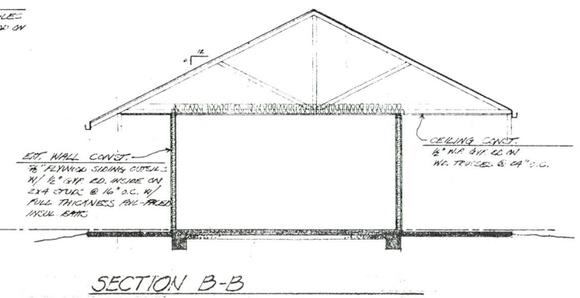
LEFT ELEVATION



RIGHT ELEVATION



SECTION A-A



SECTION B-B

GROSS FLOOR AREAS:

RESIDENCE	675#
STORAGE	49#

SYMBOL	DESCRIPTIONS	DATE	APPROVAL

REVISIONS

NUMKENA ASSOCIATES, INC.

U. S. ARMY ENGINEER DISTRICT
LOS ANGELES
CORPS OF ENGINEERS

DESIGNED BY: D.C.N
DRAWN BY: WM/PD
CHECKED BY: J.C.O

PRELIMINARY DESIGN

ALLENVILLE COMMUNITY DEVELOPMENT

PLAN "A" 1-BEDROOM UNIT

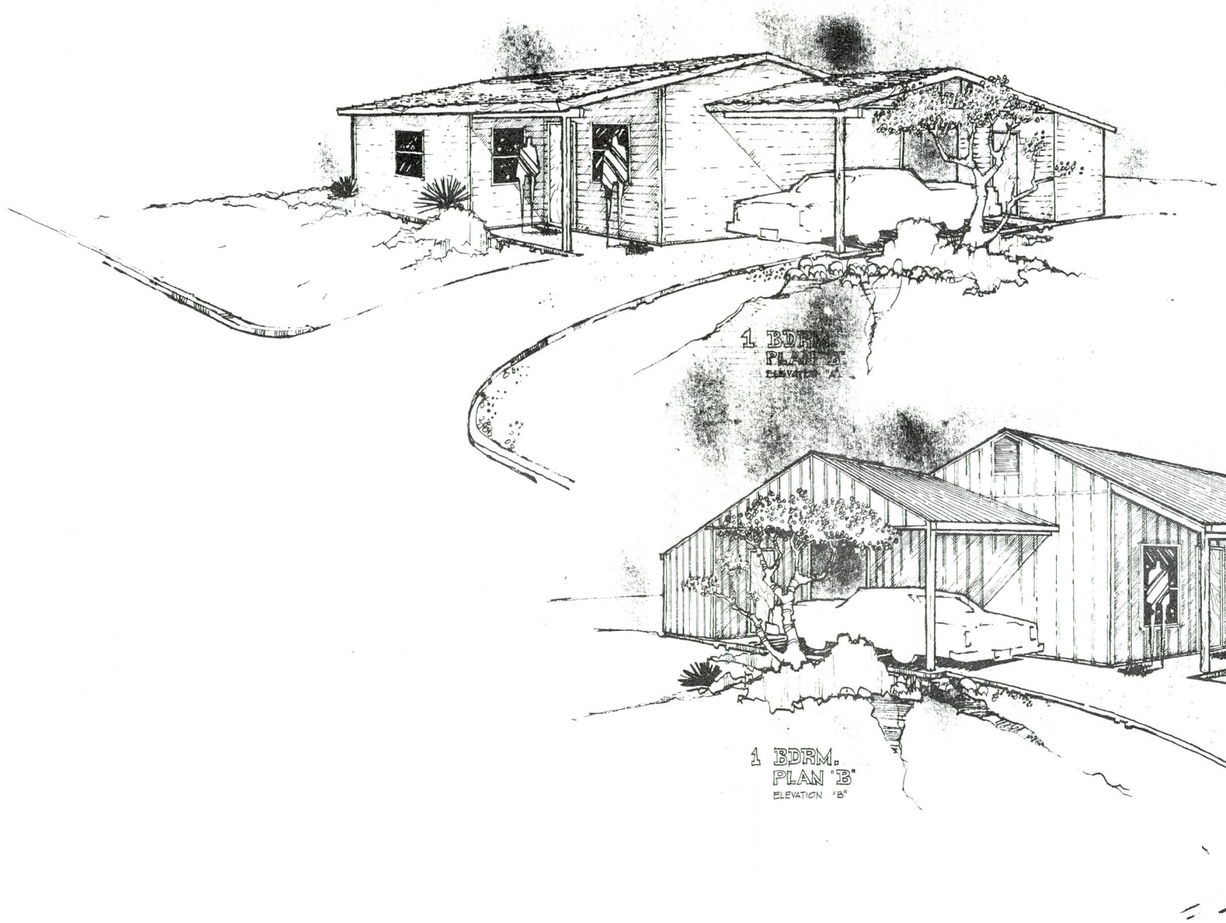
SUBMITTED BY: _____ CHIEF, BRANCH

DATE APPROVED: _____

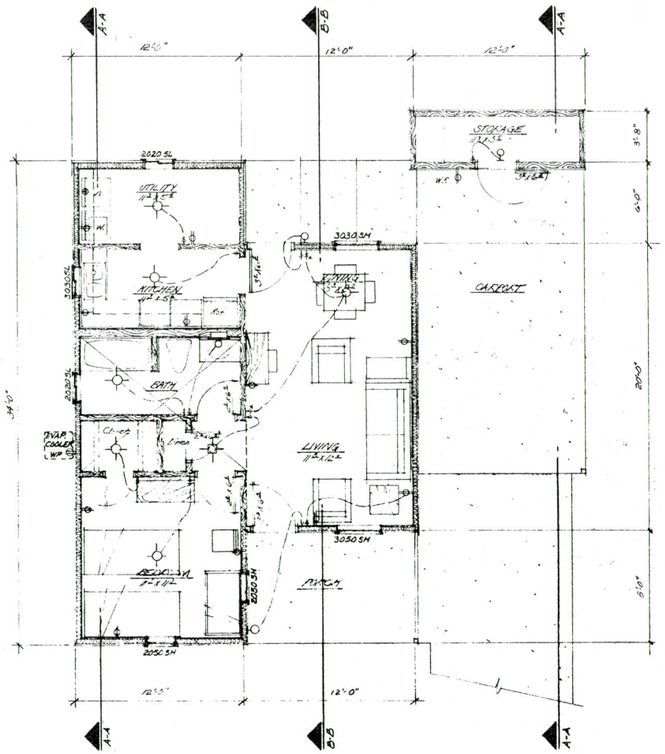
SPEC. NO. DACW09-____-B-____

DISTRICT FILE NO.

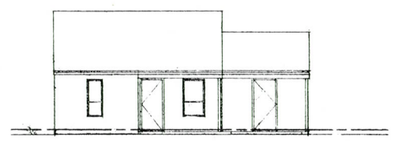
SHEET A14


1 BDRM.
PLAN "B"
ELEVATION "A"

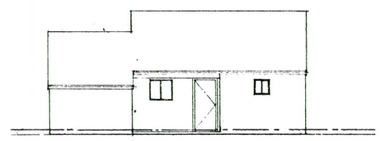
1 BDRM.
PLAN "B"
ELEVATION "B"



FLOOR PLAN - 1 BR. UNIT PLAN "B"



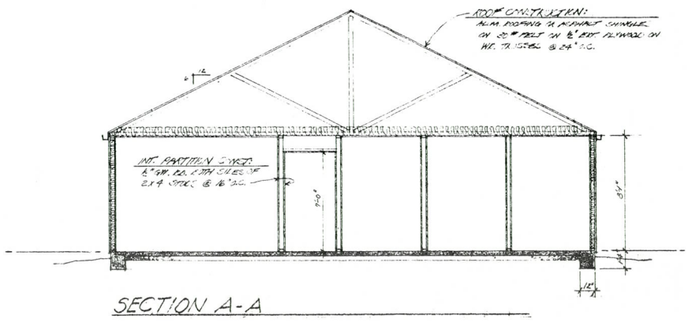
RIGHT ELEVATION



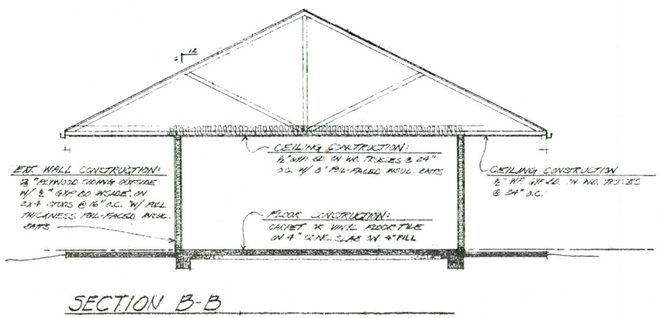
REAR ELEVATION

LEFT ELEVATION

RIGHT ELEVATION



SECTION A-A



SECTION B-B

GROSS FLOOR AREAS:

RESIDENCE	654 #
STORAGE	49 #

SYMBOL	DESCRIPTIONS	DATE	APPROVAL
	REVISIONS		

NUMKENA ASSOCIATES, INC.

U. S. ARMY ENGINEER DISTRICT
LOS ANGELES
CORPS OF ENGINEERS

DESIGNED BY: DCN
DRAWN BY: WM/PD
CHECKED BY: JRD

PRELIMINARY DESIGN

ALLENVILLE COMMUNITY DEVELOPMENT

PLAN "B" 1-BEDROOM UNIT

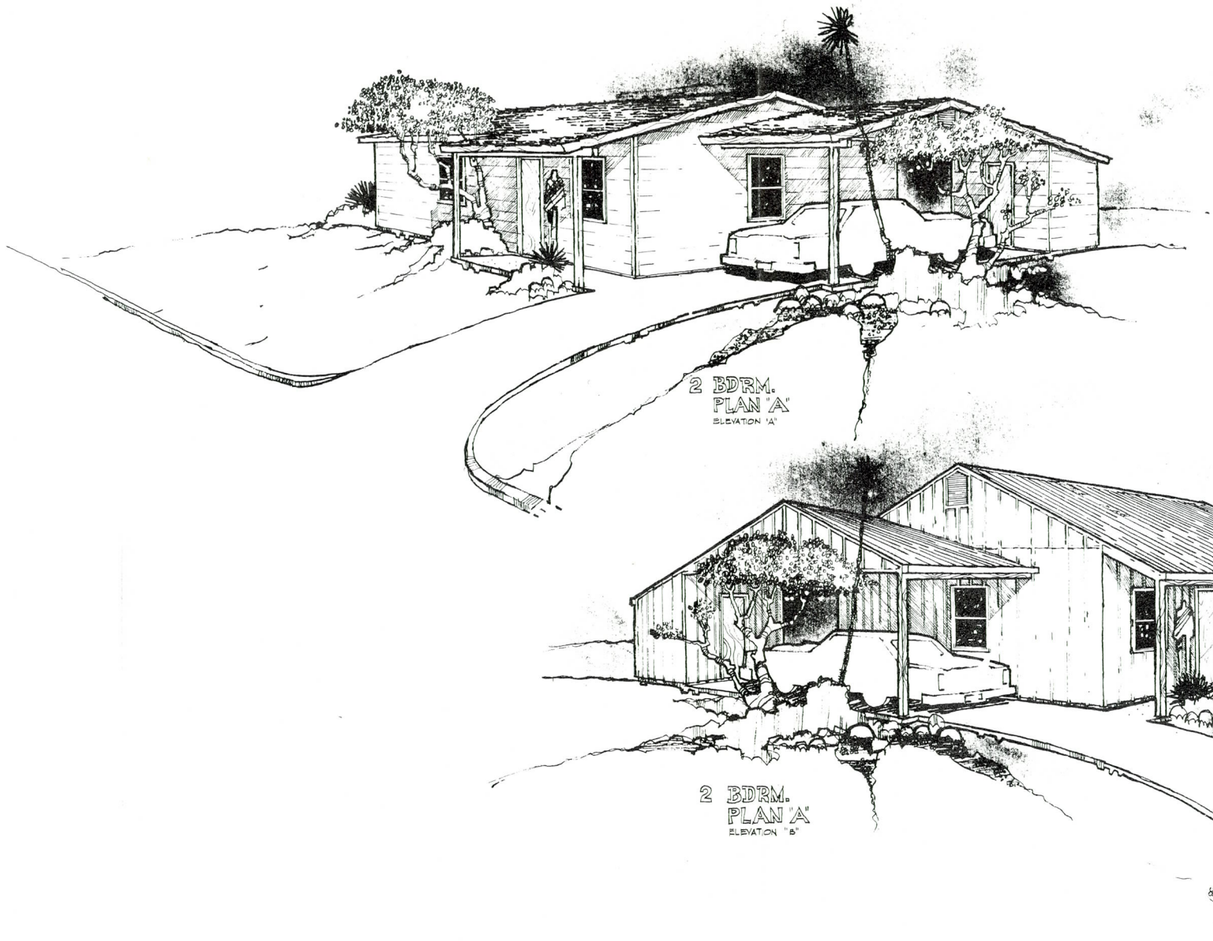
SUBMITTED BY: _____ CHIEF, BRANCH

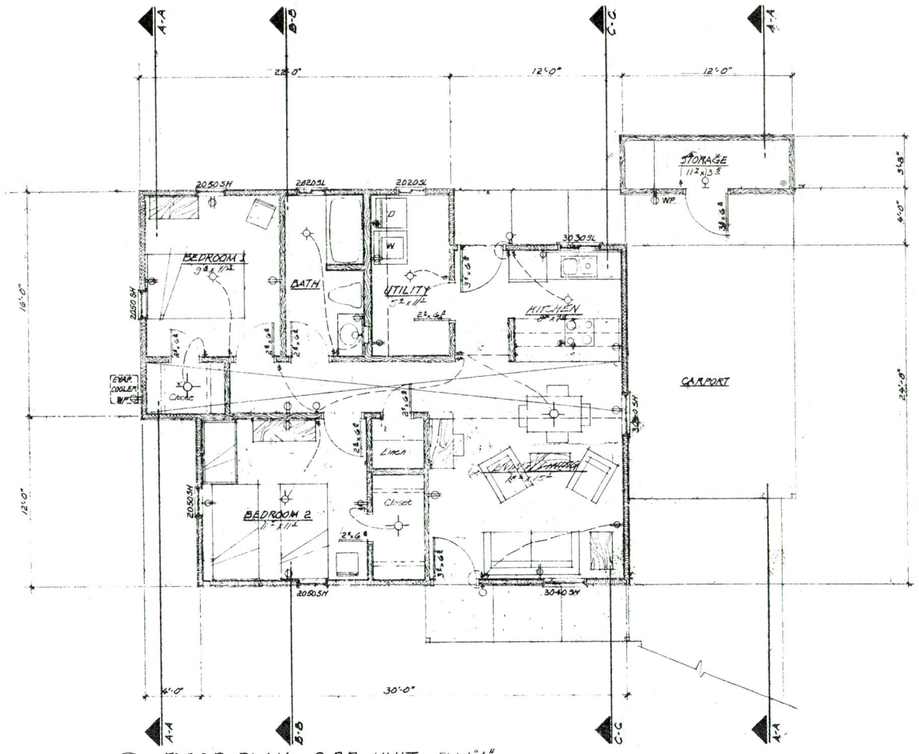
DATE APPROVED: _____

SPEC. NO. DACW 09-____-B-____

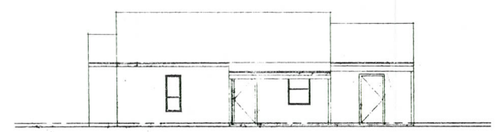
DISTRICT FILE NO.

SHEET A16


2 BDRM.
PLAN 'A'
ELEVATION 'A'
2 BDRM.
PLAN 'A'
ELEVATION 'B'



FLOOR PLAN - 2 BR. UNIT, PLAN "A"

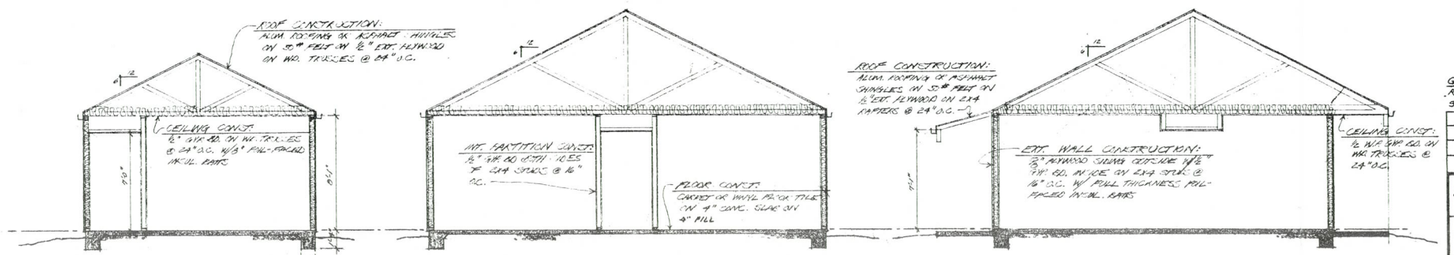


FRONT ELEVATION

RIGHT ELEVATION

REAR ELEVATION

LEFT ELEVATION



SECTION A-A

SECTION B-B

SECTION C-C

GROSS FLOOR AREAS:
RESIDENCE 861 ft²
STORAGE 44 ft²

SYMBOL	DESCRIPTIONS	DATE	APPROVAL

REVISIONS

NUMAKENA ASSOCIATES, INC.

U. S. ARMY ENGINEER DISTRICT
LOS ANGELES
CORPS OF ENGINEERS

DESIGNED BY: DCN
DRAWN BY: PD/WM
CHECKED BY: JRD

PRELIMINARY DESIGN

ALLENVILLE COMMUNITY DEVELOPMENT

PLAN "A" 2-BEDROOM UNIT

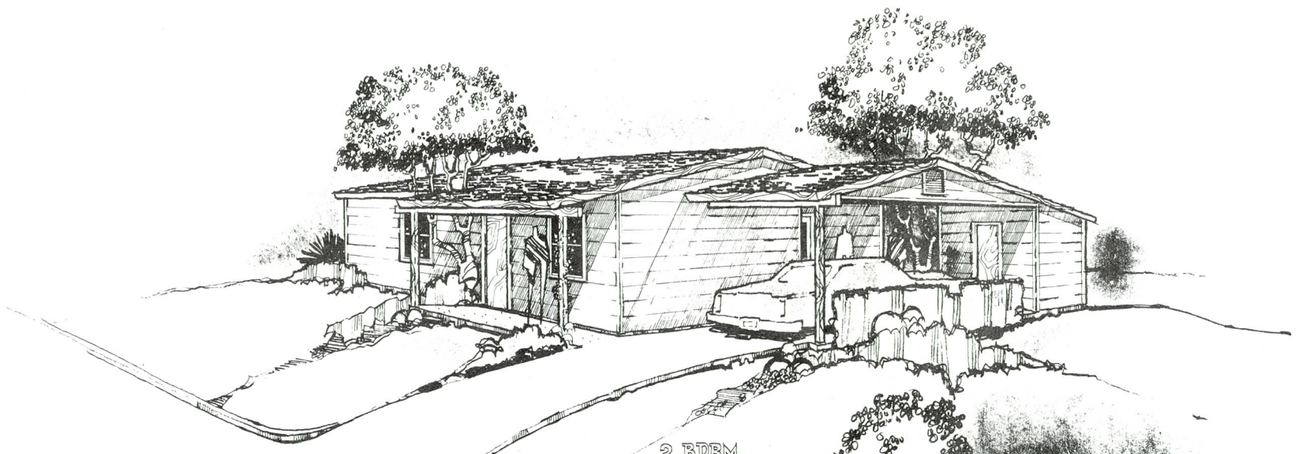
SUBMITTED BY: CHIEF, BRANCH

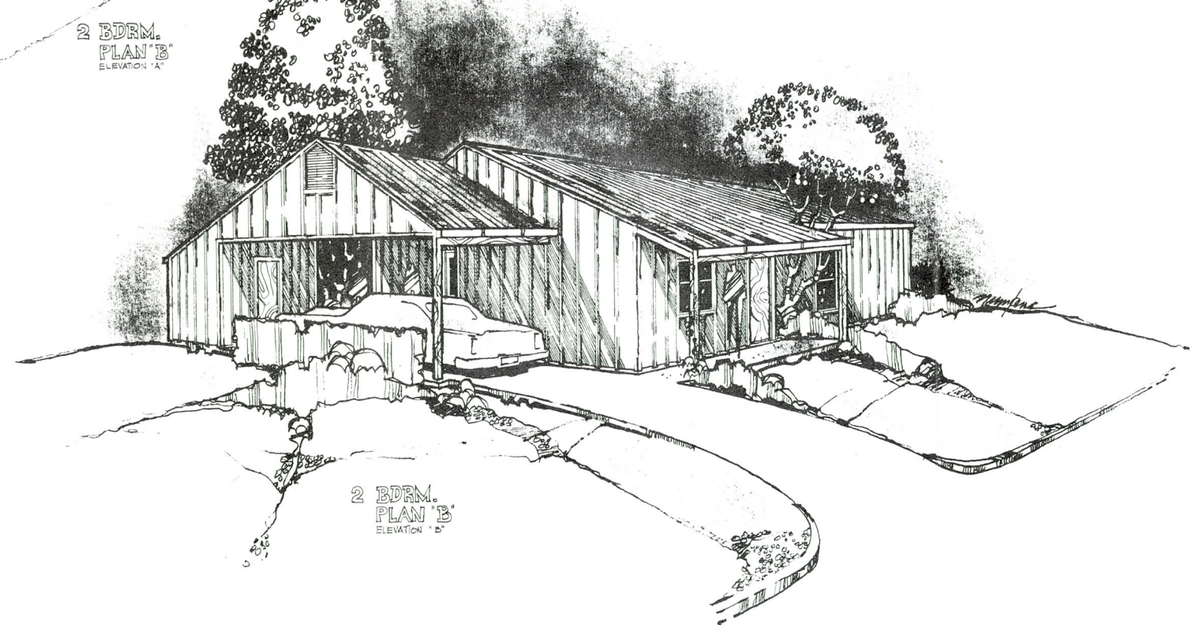
DATE APPROVED:

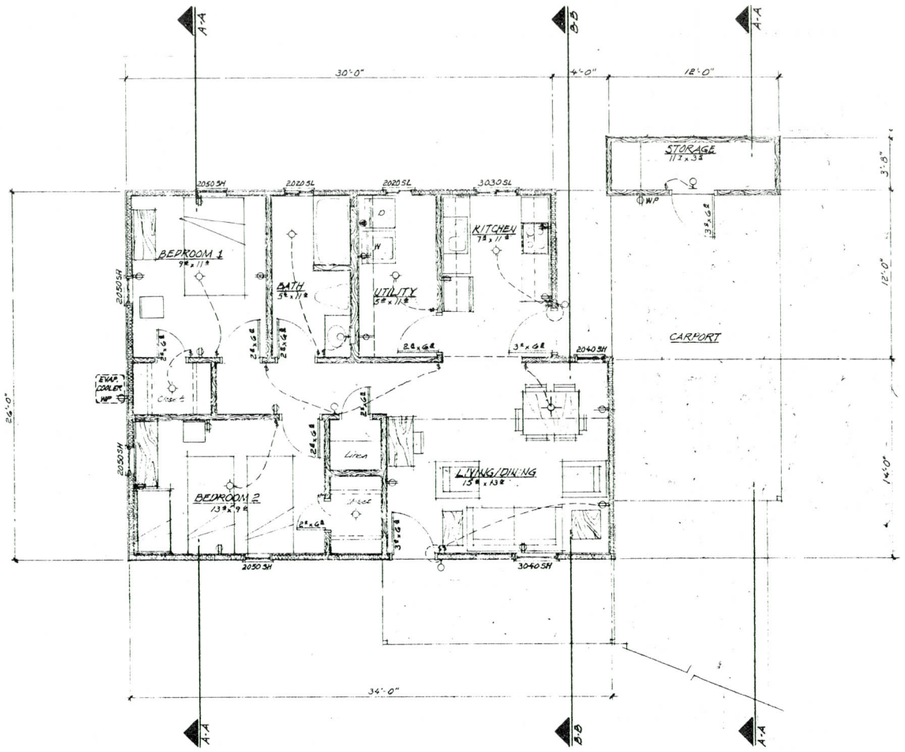
SPEC. NO. DACW09-____-B-____

DISTRICT FILE NO.

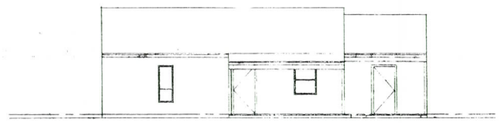
SHEET A18


2 BDRM.
PLAN 'B'
ELEVATION 'A'

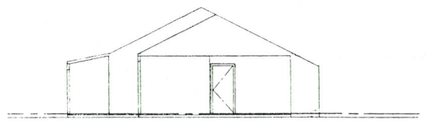

2 BDRM.
PLAN 'B'
ELEVATION 'B'



FLOOR PLAN - 2 BR. UNIT PLAN "B"



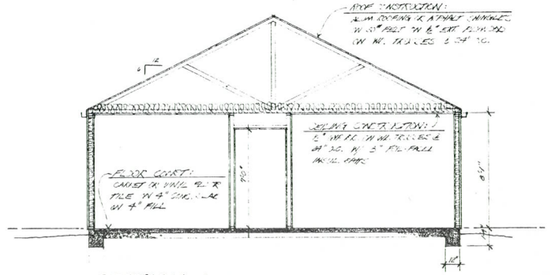
FRONT ELEVATION



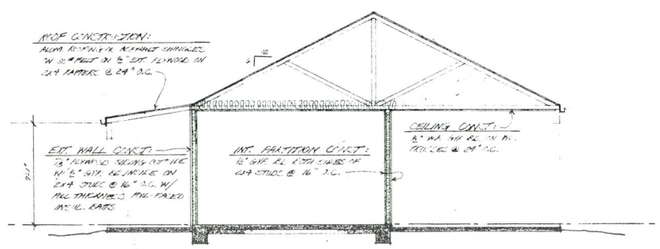
RIGHT ELEVATION

REAR ELEVATION

LEFT ELEVATION



SECTION A-A



SECTION B-B

GROSS FLOOR AREAS:

RESIDENCE	840 ☐'
STORAGE	44 ☐'

SYMBOL	DESCRIPTIONS	DATE	APPROVAL

REVISIONS

NUMKENA ASSOCIATES, INC.

U. S. ARMY ENGINEER DISTRICT
LOS ANGELES
CORPS OF ENGINEERS

DESIGNED BY: DCN
DRAWN BY: WM/PO
CHECKED BY: JRD

PRELIMINARY DESIGN

ALLENVILLE COMMUNITY DEVELOPMENT

PLAN "B" 2-BEDROOM UNIT

SUBMITTED BY: _____ CHIEF, _____ BRANCH

DATE APPROVED: _____

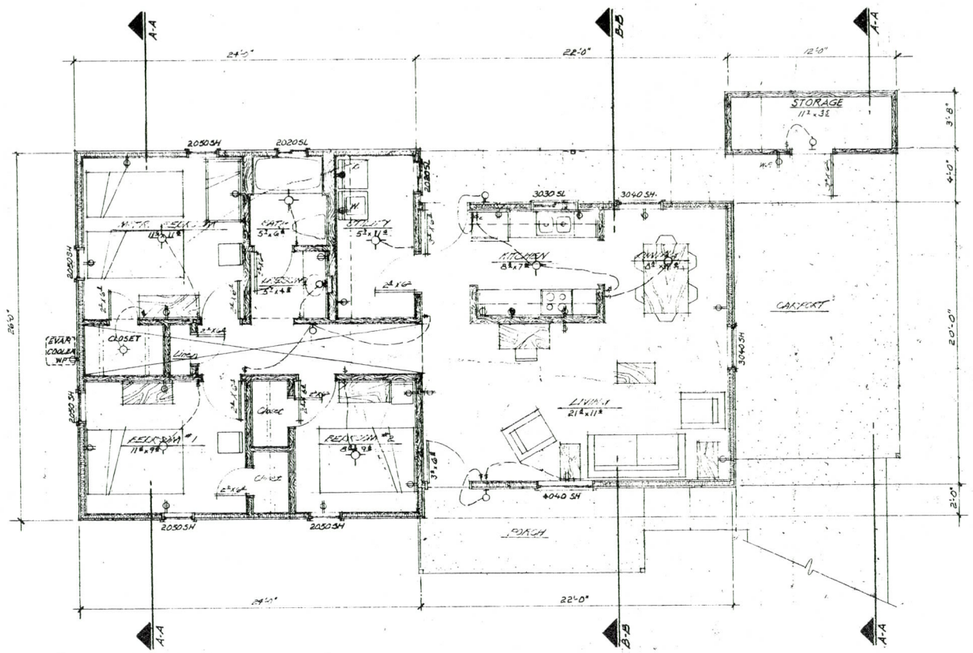
SPEC. NO. DACW09- ____ B- ____

DISTRICT FILE NO.

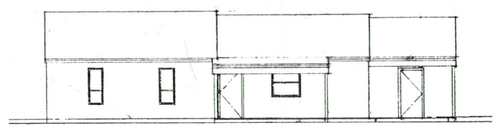
SHEET A90

3 BDRM.
ELEVATION "A"

3 BDRM.
ELEVATION "B"

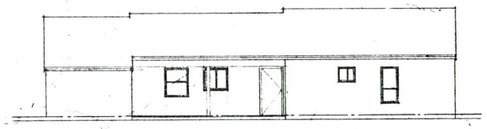


FLOOR PLAN – 3 BR. UNIT



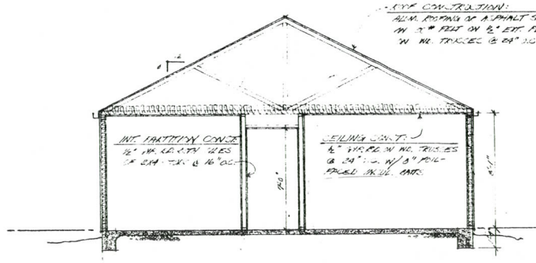
FRONT ELEVATION

RIGHT ELEVATION

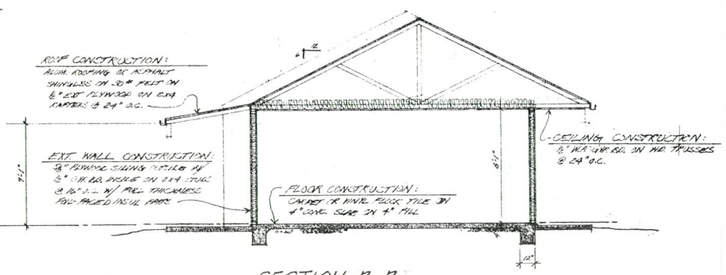


REAR ELEVATION

LEFT ELEVATION



SECTION A-A



SECTION B-B

GROSS FLOOR AREAS:
RESIDENCE 1008 ft
STORAGE +99

SYMBOL	DESCRIPTIONS	DATE	APPROVAL
	REVISIONS		

NUMKENA ASSOCIATES, INC.

U. S. ARMY ENGINEER DISTRICT
LOS ANGELES
CORPS OF ENGINEERS

DESIGNED BY: DCN
DRAWN BY: WM/PD
CHECKED BY: JRD

PRELIMINARY DESIGN

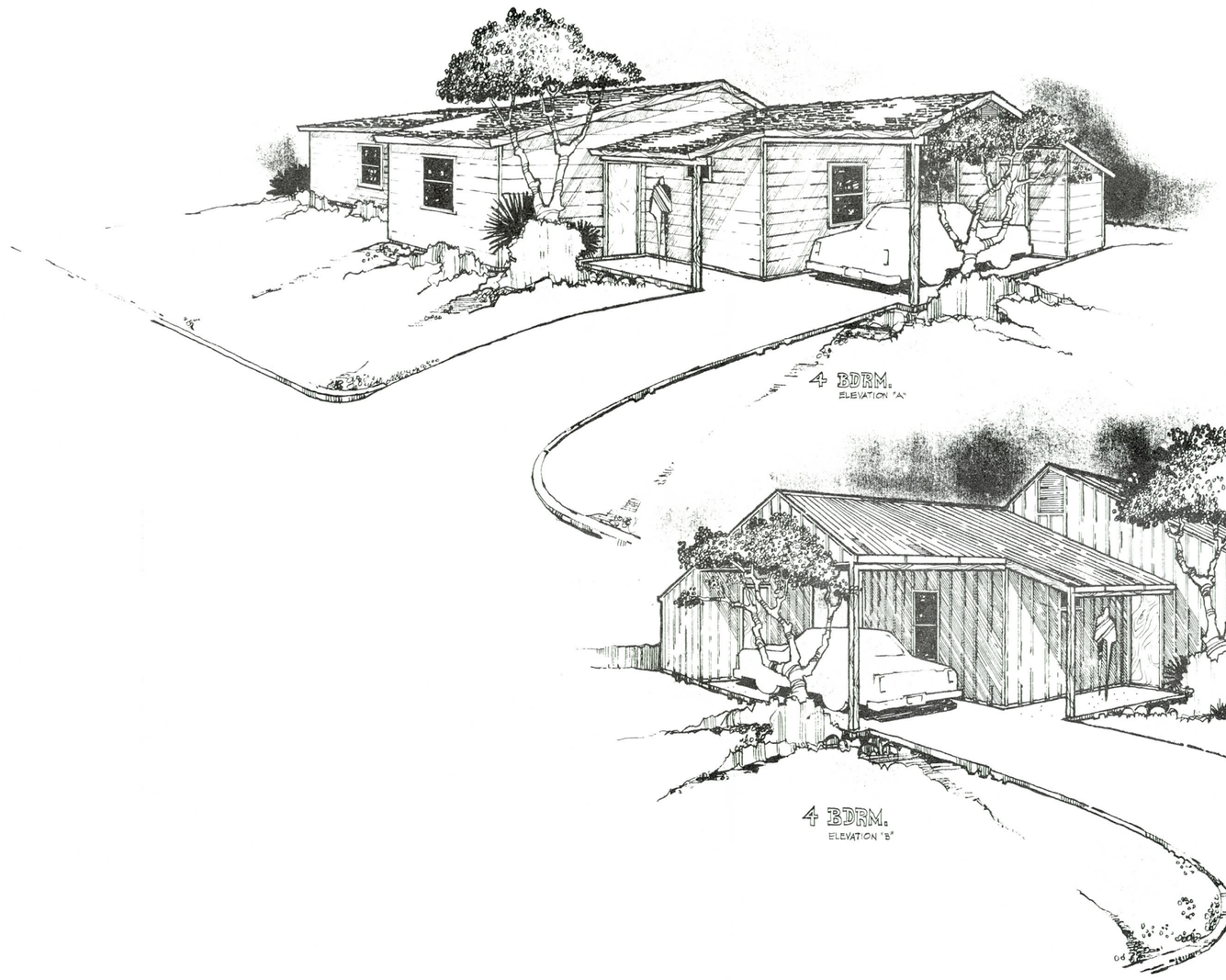
ALLENVILLE COMMUNITY DEVELOPMENT

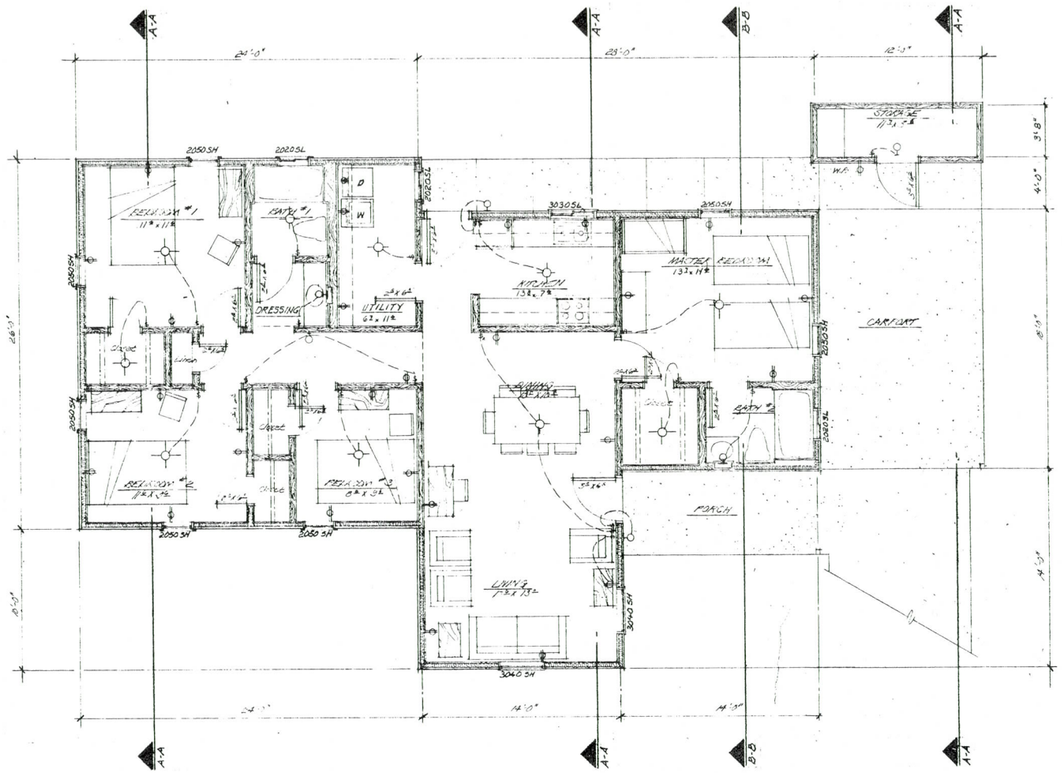
3-BEDROOM UNIT

SUBMITTED BY: _____ DATE APPROVED: _____
CHIEF, _____ BRANCH

SPEC. NO. DACW09-____-B-____
DISTRICT FILE NO. _____

SHEET A22

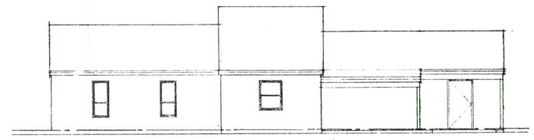

4 BDRM.
ELEVATION "A"
4 BDRM.
ELEVATION "B"



FLOOR PLAN – 4 BR UNIT

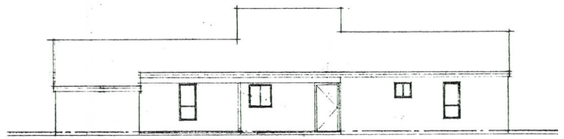
SECTION A-A

SECTION B-B



FRONT ELEVATION

RIGHT ELEVATION



REAR ELEVATION

LEFT ELEVATION

GROSS FLOOR AREAS:

RESIDENCE	1332#
STORAGE	44#

SYMBOL	DESCRIPTIONS	DATE	APPROVAL

REVISIONS

NUMKENA ASSOCIATES, INC.

U. S. ARMY ENGINEER DISTRICT
LOS ANGELES
CORPS OF ENGINEERS

DESIGNED BY: DCN
DRAWN BY: WAM/PD
CHECKED BY: JRD

PRELIMINARY DESIGN

ALLENVILLE COMMUNITY DEVELOPMENT

4-BEDROOM UNIT

SUBMITTED BY: _____ DATE APPROVED: _____
CHIEF, _____ BRANCH

SPEC. NO. DACW09-____-B-____
DISTRICT FILE NO.

SHEET A24

APPENDIX D

ECONOMICS

This appendix presents the economic evaluation of the five major alternatives for flood damage reduction in the vicinity of the community of Allenville, Arizona. For a project such as this to be economically viable, National Economic Development (NED) benefits must equal or exceed NED costs.

Two types of alternatives, structural and nonstructural, are discussed in this appendix. Structural alternatives include a levee and channel clearing. The three nonstructural alternatives include flood proofing and two permanent relocation plans. The recommended plan relocates Allenville residents as a community. The individual relocation plan maximizes NED benefits but separates a close knit community.

METHODOLOGY

Corps of Engineers Regulation (ER) 1105-2-351 establishes the methodology for the analysis of the structural alternatives and flood proofing. A different regulation, ER 1105-2-353, establishes a methodology for the analysis of the relocation alternatives. Regulation ER 1105-2-353 provides an example which permanently evacuates current uses from the floodplain and converts the floodplain to new uses, but does not physically relocate structures to flood-free sites. The alternative described as "individual relocation" in this report follows this case exactly in that this example presupposes the floodplain users relocate into existing housing available on the open market. A "community relocation" alternative, which is analyzed using the same method was studied in an effort to achieve the objective of community cohesion as strongly desired by the residents of Allenville. This alternative involves the construction of a replacement community in a flood-free site. Whether the floodplain users move into existing homes or homes constructed for that purpose does not change the method of analysis. The cost of building the new homes is offset by the benefits the new home provides, and therefore do not effect the analysis.

WITHOUT PROJECT CONDITIONS

Allenville is located in the floodplain of the Gila River. Damages begin to occur when flows in the Gila River at Allenville exceed approximatley 65,000 cfs. Hydrodynamic conditions within the river channel affecting Allenville are not expected to change significantly in the without project condition. The Central Arizona Water Control Study (CAWCS) is evaluating alternative flood control measures on the Gila River. This study, however, is only in the early stages of the planning process, and implementation of any solutions will be many years in the future. Furthermore, the alternatives being studied cannot guarantee adequate protection of Allenville.

The residents of the community, living in temporary housing since the March 1978 flood, cannot be expected to wait much longer for a solution to their flooding problems. As an example, between March and December 1978, many of the families had repaired their homes and had returned to them. Many of those who remained in temporary housing had made some repairs and

were planning to return when the December flood occurred, once again rendering the community uninhabitable. Despite two such destructive events since December 1978, five families moved back to their homes prior to the February 1980 flood.

The social and economic conditions of Allenville are assumed to remain unchanged for the next 100 years, with the exception of an increase in the value of household contents. This increase is expected to pace the growth rate for personal income.

Although most of the residences in Allenville are substandard, sociological factors indicate that the community would remain very much as it is now. Although there is a higher than normal percentage of older people living in Allenville, the age distribution is not significantly different from any other low income neighborhood. Also, most of the families have lived in the community for many years, and have three or more generations living in the same household or nearby in the community. In such a close-knit community, families tend to stay together, and, as the children mature, they remain in the immediate vicinity.

Young adults are, for the most part, the only age group financially able to leave Allenville. These persons, however, remain bound to the community through family and social ties, pride of land ownership, and preference for a rural lifestyle. The establishment of the Allenville Community for Progress, Inc. and the Allenville Water Company, Inc. during the 1960s, and their efforts to improve the standard of living in Allenville, point to a commitment on the part of the residents to the continuation of the community. Such improvements as the installation of a well and water distribution system, purchase of a community center, and establishment of a County park and day-care center, would - under normal circumstances - lead to an increase in housing units and population. In Allenville, however, Maricopa County floodplain zoning ordinances allow repair of existing homes, but prohibit future development. Also, alternative sites, at least as desirable as Allenville, are widely available. No increases in market value of the present Allenville site would occur from the open space managed for wildlife habitat.

THE COST OF ALTERNATIVES

The NED costs are compared to the average annual benefits by annualizing the costs at the Water Resource Council's discount rate of 7-1/8 percent for a 100-year period of analysis. Benefits are analyzed for the same period. Average annual costs equal the amount of money needed every year for 100 years to equal the present value of all project costs in the first year of construction.

Structural Alternatives

The costs developed for each structural alternative are estimates of first costs for construction, as well as operation and maintenance (O & M) costs.

Two structural alternatives were studied: channel clearing and a levee. The estimated costs and benefits for construction and O & M for all alternatives are compared in Table D-1. Channel clearing, with an annualized cost of $1,800,000 is the most expensive plan. The levee, designed to provide standard project flood (SPF) protection, would eliminate nearly all flood damages, at an average annual cost of $99,000. (The SPF is the flood that may be expected from the most severe combination of meteorologic and hydrologic conditions that are considered reasonable characteristics of the region.)

Nonstructural Alternatives

Two of the nonstructural alternatives, community relocation and flood proofing, have similar features in that both involve construction of a new Allenville. Community relocation would rebuild Allenville outside the floodplain. Flood proofing would reconstruct most buildings after the landfill has elevated the sites which they occupy one foot above the 100-year floodplain. The construction and conditions of the buildings still standing in Allenville are such that none could be physically raised or moved. Streets and utilities also would have to be improved to meet County standards.

Individual relocation differs from community relocation in that it involves the purchase of new homes from the current real estate market rather than the construction of a complete new town. National Economic Development costs are essentially the same. The housing in Allenville can be characterized as primarily substandard. Any relocation plan must provide safe, decent and sanitary housing, in compliance with the Department of Housing and Urban Development (HUD) standards. Any improvements above existing conditions are not considered to accrue NED costs because the social benefits are assumed to at least equal the associated financial costs. Likewise, the costs associated with the improvement of support utilities (i.e., streets, power and water) are not included as NED costs. The cost of replacement support utilities up to the value of existing facilities in Allenville, however, is considered a NED cost. This plus engineering and design costs are the only differences in NED costs between the two relocation alternatives. The value of the existing substandard support facilities ($89,000) must be included in the NED costs of the community relocation plan. ER 1105-2-353 provides two examples with which to evaluate the NED cost of a nonstructural alternative. Both examples evaluate the NED cost of acquisition of lands and structures in the floodplain at fair market value. Fair market value is assumed to reflect fully the property value if it were not in the floodplain, less the expected value of damages borne by the owners. The State of Arizona appraised the fair market value of the Allenville property for the purpose of acquisition of the structures only in January 1980. The mean value of the residences in this appraisal was $10,174.

The cost of removing the structures from the floodplain (either razing the buildings or physically moving them) is a NED cost. The structures in the floodplain will be razed at an estimated NED cost of $110,000. Under the community relocation alternative, new housing would be constructed on lands provided by the local sponsor at the

proposed relocation site. The new housing will then be sold to the people of Allenville at a fair market value by the State of Arizona. The community relocation alternative was evaluated using plans allowing for eleven families to move to locations other than the new community site. Total project costs both for relocation alternatives and for flood-proofing equal the NED costs plus financial costs. Only NED costs, however, are used in evaluating the alternatives. See Table 6, Main Report, for a summary of first, NED and total costs.

Valuation of the Floodplain

The values of structures and contents and the depth/damage relationship are based upon information gathered after the March 1978 flood. (See Tables D-2 and D-5.) This information was obtained by the Corps in a post-disaster, house-to-house survey. Restoration of the structures and their contents after the March 1978 flood was under way when the December 1978 flood occurred. The March 1978 flood damage survey was the only basis for the depth/damage relationships because of incomplete restoration at the time of the December flood.

The January 1980 State appraisal was used to update structural values obtained in the Corps survey. Content values are assumed to increase with personal income. The 1972 Office of Business Economics and Economic Research Service Series E projections of per capita income are provided for several areas which include Allenville, namely the Phoenix Standard Metropolitan Statistical Area, the Water Resource Sub-area, and the State of Arizona. All sets of projections provided per capita income growth rates which were approximately the same. Therefore, the smallest area (Maricopa County) was used as the basis for the analysis. The values of the structures in the floodplain are displayed in Table D-2.

THE BENEFITS OF ALTERNATIVES

Three categories of benefits can result from implementing alternatives: Intensification, location and inundation reduction. An intensification benefit is the increased net income resulting from an activity presently in the floodplain which remains in the floodplain. Location benefits result when an activity uses the floodplain with the project, but not in the without project condition. Inundation reduction benefits are flood damages reduced by the project.

Intensification benefits do not apply to this study. Allenville relocation alternatives remove current uses from the floodplain. In regard to the other alternatives, the net income from the use of the existing Allenville property is not expected to increase significantly, and for this reason intensification benefits were not evaluated.

Location benefits do not apply to this study as currently outlined. Only two alternatives, the two relocation plans, could bring new uses into the Allenville floodplain. Allenville is not a very desirable floodplain location. In fact, much of Allenville is in the floodway. It is

directly below the Buckeye sewage treatment plant, and next to a sand and gravel operation. County zoning ordinances severely restrict future land use. The potential uses of the evacuated floodplain, therefore, are limited, but they could include low damage potential agriculture (pasture, alfalfa, etc.) or fish and wildlife habitat.

Inundation benefits result from all of the alternatives. The benefits for structural and nonstructural alternatives are described below.

Structural Alternatives

The analysis of structural alternatives includes all damage reduction as benefits. Flood damages caused by various events were calculated for both without and with project conditions. These were applied to the discharge frequency relationships to obtain the frequency-damage relationship, and then integrated to obtain average annual damages for the without and with project conditions. The with project damages were subtracted from the without project damages to obtain damages prevented by the project.

Damages were calculated for various interior flood depths as a percentage of the estimated market value (Table D-5). This table indicates that even at the lowest flooding levels, a high percentage of damage is realized. Thirty-one percent damage to structures occurs at one foot. The low grade of construction at Allenville leaves the structures more susceptible (in terms of percentage of the total value) to damages than a standard building. About $3,000 in structural damage occurs to the typical Allenville home with one foot of water inside. In many cases, this damage includes complete loss of the septic tank for the home. Loss of home contents occurs rapidly with the rise of flood levels. At four feet, the loss is total. This amounts to a $3,250 contents loss inside the typical home. Most of the flood damages to structures and contents in Allenville occur to homes which have relatively low market values. The damages from any flood could not exceed the market value of the structure, even though the cost of replacement might. All flood damages prevented for public and commercial buildings were included in the structural alternative analyses because all land uses within the floodplain would experience benefits from these alternatives (see Plate D-1).

Public utility damages will be reduced or eliminated under all of the alternatives. Damages to public utilities were about $55,000 for both the March and December 1978 floods. Without project damages were assumed to correspond to a straight line function between no damages with a 65,000 cfs flow and $55,000 at all flows above the March 1978 flood peak of 95,000 cbs. (See Plate D-2.) Benefits equal the average annual reduction of these damages. The levee and channel clearing alternatives gain additional benefits from protecting the Buckeye sewage treatment plant. Nearly all of the estimated flood damages to the plant in the without project condition are expected to be eliminated by the levee.

The Federal Emergency Management Agency (FEMA) provided emergency cost data for the flood of March 1978. Of these costs ($873,000), $635,000 covered administration of the temporary housing assistance program and related expenses. Most of the remaining costs were for replacement of damaged property and are counted as physical flood damages. The emergency costs covered a period of ten months, until the December flood. Most temporary costs ($300,000) went to set up mobile homes after the March 1978 flood forced the evacuation of Allenville. The December flood emergency costs were not used because the mobile homes were already in place. The assumption was made that emergency costs would never exceed the $635,000 expended after the March flood. Having no other historical data, emergency costs were calculated to conform to a straight line function downward to zero for a flood of 65,000 cgs. (See Plate D-3.)

The benefits accruing to the channel clearing alternative are the lowest of the five plans discussed in this appendix, and would have the highest cost. Benefits are $32,600 per year, while costs are nearly $1,800,000. This results in a benefit/cost ratio of 0.02. The SPF levee would provide annual benefits of approximately $88,000 at an average annual cost of $99,500, giving a benefit/cost ratio of nearly 0.9.

Nonstructural Alternatives

For the relocation alternatives, the economic methodology includes benefits from the elimination of flood damages not borne by floodplain users. These are already accounted for in the fair market value of floodplain property. Flood damages borne by the nation result from the federally subsidized Flood Insurance Administration (FIA) program insuring floodplain users. The amount by which actuarial rates would exceed the subsidized FIA rates is the potential NED benefit. Even though Allenville residents are not currently enrolled in the FIA program, using the principle of economic rationality, flood damages were analyzed with the assumption that the residents were insured. Because of the three recent flood events (March and December 1978 and February 1980), most of the families in Allenville might be expected to purchase flood insurance if they were to reoccupy their floodplain homes.

Average annual relocation benefits for residential property total $34,700 less deductibles of $2,700. These deductibles include insurance premiums and a standard $200 deduction for each flood event for each home. The total equivalent average annual insurance premium is $2,100. This annualized equivalent of the insurance premiums is expected to increase in time as the value of insured contents increases. The average annual equivalent of the $200 deduction for the 50 homes is about $600.

Public and commercial benefits for relocation are the elimination of damages to the local community center, park, day-care center, and streets, as well as the externalized damages to the lodge, the commercial concern, and the two churches. Relocation would totally eliminate the emergency costs due to flooding since the community and individuals would no longer be located in the floodplain. The flood proofing alternative

gains additional benefits from protecting the Buckeye sewage treatment plant. Nearly all of the estimated flood damages to the plant in the without project condition are expected to be eliminated by flood proofing. However, Allenville would still be vulnerable to flood damages from flows expected to occur less than every 100 years. Damages would not be as severe to the elevated areas because of lower water depths.

The floodplain will become open space for wildlife habitat with either relocation plan. The environmental quality of the area will be improved through the increased riparian habitat. The benefits from this are intangible and are discussed in the Environmental Assessment. In some cases, open space use of the floodplain could give rise to a positive externality on adjacent lands; however, the adjacent land uses at the current Allenville site (agriculture, sewage treatment, and sand and gravel mining) will derive no monetary gain from the open space.

Both relocation alternatives are economically justified, and provide the same $88,000 in annual benefits. The individual relocation alternative is the NED plan, with annual NED costs of $56,500 and a benefit/cost ratio of 1.6. The community relocation plan, though costing more than $64,200 average annual costs, is the recommended plan, and has a benefit/cost ratio of 1.4. The flood proofing alternative is not economically justified, providing $92,200 in annual benefits for the annualized costs of $198,600 with a benefit/cost ratio of 0.5.

SUMMARY

Tables D-2 and D-3 show the current land use and value of the Allenville floodplain. These values were applied to the depth of flooding (Tabel D-4) and the depth damage curves (Table D-5) to arrive at damages for various sizes of flood events (Tables D-6 and D-7). Average annual damages were then computed for both without project conditions (Table D-8) and the various project alternatives, except relocation (Table D-9). Damages prevented (Table D-10) are the differences between the without project conditions and the associated residual damages for each project. Table D-11 shows the average annual benefit computation for the two relocation alternatives.

CONCLUSIONS

The relocation alternatives are the only plans with benefit/cost ratios greater than 1.0 and are the alternatives with the most net benefits. Although the individual relocation alternative has the highest benefit/cost ratio and produces the most net benefits, the community relocation plan is the recommended alternative because of the overriding social advantage of maintaining community cohesion. The significant difference between NED costs and total project costs results from social benefits. Relocating Allenville will provide benefits beyond the total project costs by eliminating flood damages and bettering the lives of the residents.

TABLE D-1

ECONOMIC COMPARISON OF ALTERNATIVE PLANS*

	Community Relocation	Individual Relocation	SPF Levee	Channel Clearing	Flood-proofing
NED Costs	900	792	1,269	11,076	2,750
Annual Costs (7-1/8%-100yr)	64.2	56.5	90.5	790.0	196.1
O & M	**	-	9.0	1,000	2.5
Total Annual Cost	64.2	56.5	99.5	1,790.0	198.6
Annual Benefits	88.0	88.0	88.0	32.6	92.2
B/C Ratio	1.4	1.6	.9	0.02	0.5
Net Annual Benefits	23.8	31.5	-11.5	57.4	-106.4

*Values in thousands of dollars at January 1980 price levels, 100-year period of analysis at 7-1/8% discount rate.

**Operation and maintenance costs for the park, community center, water supply and distribution system, other utilities, and streets are expected to be essentially the same as in the without project condition. Any increase is assumed to be offset by an equal benefit.

TABLE D-2

PRESENT AND FUTURE TOTAL VALUE OF PROPERTY IN FLOODPLAIN
BY LAND USE FOR VARIOUS FLOOD EVENTS
(Jan. 1980 Price Level, Thousands of Dollars)

Land Use	Structures In* Floodplain	Total Value of Floodplain Structures 1980	1990	2000	2010	2020	2030-2080
		STANDARD PROJECT FLOOD					
Residential	50						
Structures		509	509	509	509	509	509
Contents		163	206	263	333	383	383
Commercial	1	17	17	17	17	17	17
Public/Quasi Public	3	126	126	126	126	126	126
TOTAL		815	898	915	985	1035	1035
		100 YEAR FLOOD					
Residential	50						
Structures		509	509	509	509	509	509
Contents		163	206	263	333	383	383
Commercial	1	17	17	17	17	17	17
Public/Quasi Public	3	126	126	126	126	126	126
TOTAL		815	858	915	985	1035	1035
		20 YEAR FLOOD					
Residential	45						
Structures		458	458	458	458	458	458
Contents		147	184	237	299	344	344
Commercial	1	17	17	17	17	17	17
Public/Quasi Public	3	126	126	126	126	126	126
TOTAL		748	785	838	900	945	945

*No increase in number of structures expected over 100-year period of analysis.

TABLE D-3

PRESENT AND FUTURE UNIT VALUES OF PROPERTY IN FLOODPLAIN
BY LAND USE FOR VARIOUS FLOOD EVENTS
(Jan. 1980 Price Level, Thousands of Dollars)

Land Use	1980	1990	2000	2010	2020	2030-2080
			SPF			
Residential						
Structures	10.2	10.2	10.2	10.2	10.2	10.2
Contents	3.3	4.1	5.3	6.7	7.7	7.7
Commercial	17.0	17.0	17.0	17.0	17.0	17.0
Public/Quasi Public	42.0	42.0	42.0	42.0	42.0	42.0
			100 YEAR			
Residential						
Structures	10.2	10.2	10.2	10.2	10.2	10.2
Contents	3.3	4.1	5.3	6.6	7.6	7.6
Commercial	17.0	17.0	17.0	17.0	17.0	17.0
Public/Quasi Public	42.0	42.0	42.0	42.0	42.0	42.0
			20 YEAR			
Residential						
Structures	10.2	10.2	10.2	10.2	10.2	10.2
Contents	3.3	4.1	5.3	6.6	7.6	7.6
Commercial	17.0	17.0	17.0	17.0	17.0	17.0
Public/Quasi Public	42.0	42.0	42.0	42.0	42.0	42.0

TABLE D-4

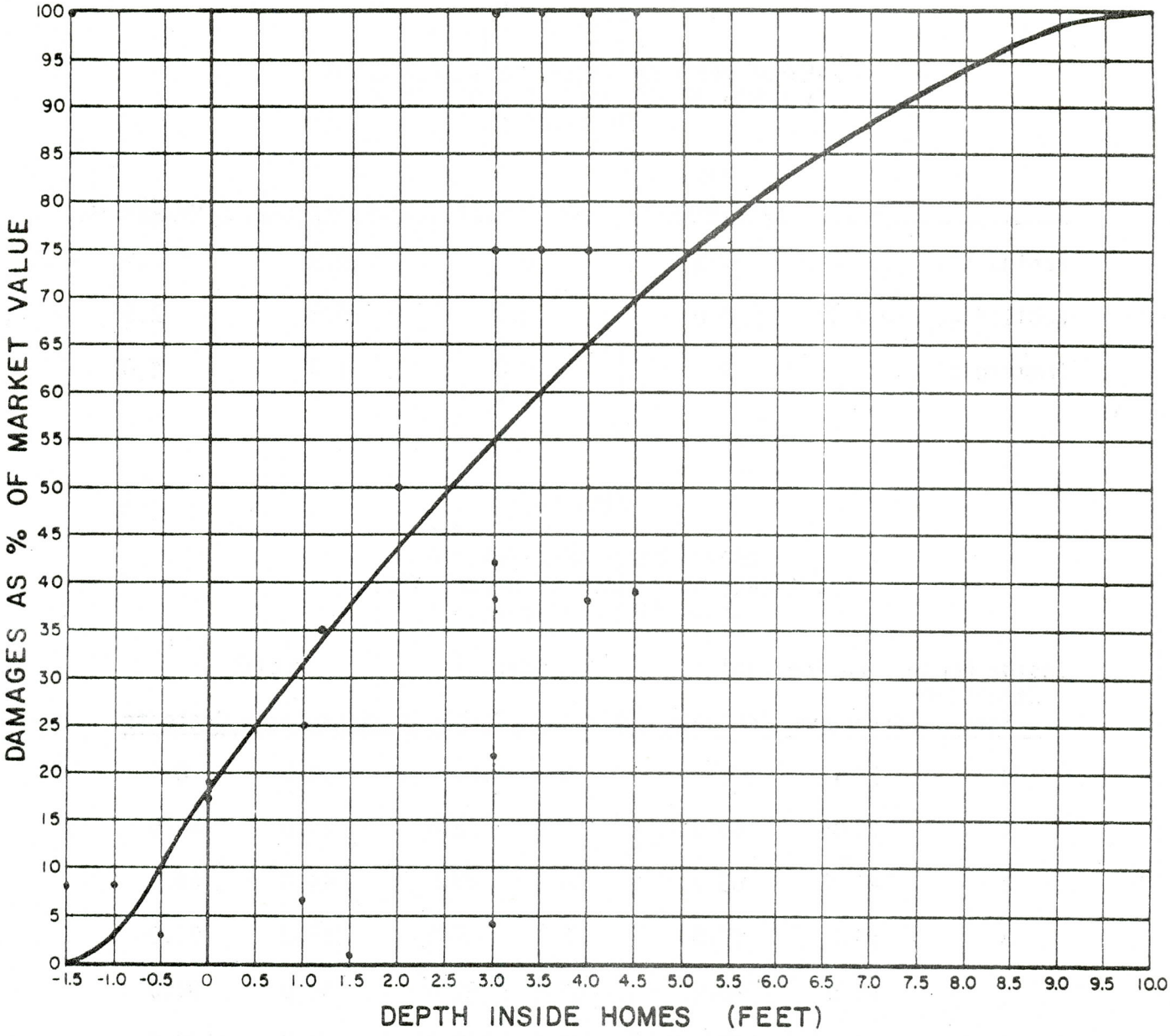
AVERAGE DEPTH OF WATER INSIDE BUILDINGS
BY LAND USE FOR VARIOUS FLOOD EVENTS
(In Feet)

	SPF (320,000cfs)	(200,000cfs)	(186,000cfs)	(100,000cfs)
Residential	7.5	6.0	4.9	1.9
Public/Quasi-Public	8.0	6.5	5.5	2.5
Commercial	9.5	8.0	7.0	4.0

TABLE D-5

DEPTH DAMAGE RELATIONSHIP
(DAMAGES AS PERCENT OF MARKET VALUE)
(Jan. 1980 Price Level)

Inside Depth Structure Feet	Residential		Commercial		Public	
	Structures	Contents	Structure	Contents	Structures	Contents
0	18.0	0	18.0	0	18.0	0
1	31.0	48.0	31.0	48.0	31.0	48.0
2	44.0	69.0	44.0	69.0	44.0	69.0
3	55.0	85.0	55.0	85.0	55.0	85.0
4	65.0	98.0	65.0	98.0	65.0	98.0
5	74.0	100.0	74.0	100.0	74.0	100.0
6	82.0	100.0	82.0	100.0	82.0	100.0
7	88.0	100.0	88.0	100.0	88.0	100.0
8	93.0	100.0	93.0	100.0	93.0	100.0
9	98.0	100.0	98.0	100.0	98.0	100.0
10	100.0	100.0	100.0	100.0	100.0	100.0



• MARCH, 1978, FLOOD DATA

— DEPTH-DAMAGE RELATIONSHIP USED IN ECONOMIC ANALYSIS

FLOOD DAMAGE CURVE
for
STRUCTURES

FIGURE D-1

TABLE D-6

ESTIMATED TOTAL DAMAGES UNDER WITHOUT PROJECT CONDITIONS
BY LAND USE FOR VARIOUS FLOOD EVENTS
(Jan. 1980 Price Level, Thousands of Dollars)

	1980	1990	2000	2010	2020	2030-2080
SPF						
Residential						
Structure	464	464	464	464	464	464
Contents	163	206	263	333	383	383
Commercial	17	17	17	17	17	17
Public/Quasi-Public	126	126	126	126	126	126
100 YEAR						
Residential						
Structure	406	406	406	406	406	406
Contents	159	201	257	325	374	374
Commercial	16	16	16	16	16	16
Public/Quasi-Public	65	65	65	65	65	65
20 YEAR						
Residential						
Structure	219	219	219	219	219	219
Contents	103	130	166	211	242	242
Commercial	10	10	10	10	10	10
Public/Quasi-Public	50	50	50	50	50	50

TABLE D-7

ESTIMATED UNIT DAMAGES UNDER WITHOUT PROJECT CONDITIONS
BY LAND USE FOR VARIOUS FLOOD EVENTS
(Jan. 1980 Price Level, Thousands of Dollars)

STANDARD PROJECT FLOOD

	1980	1990	2000	2010	2020	2030-2080
Residential						
Structure	9.3	9.3	9.3	9.3	9.3	9.3
Contents	3.3	4.1	5.3	6.7	7.7	7.7
Commercial	17.0	17.0	17.0	17.0	17.0	17.0
Public/Quasi-Public	42.0	42.0	42.0	42.0	42.0	42.0

100 YEAR

Residential						
Structure	8.1	8.1	8.1	8.1	8.1	8.1
Contents	3.2	4.0	5.1	6.5	7.5	7.5
Commercial	16.0	16.0	16.0	16.0	16.0	16.0
Public/Quasi-Public	21.7	21.7	21.7	21.7	21.7	21.7

20 YEAR

Residential						
Structure	4.9	4.9	4.9	4.9	4.9	4.9
Contents	2.3	2.9	3.7	4.7	5.4	5.4
Commercial	10.0	10.0	10.0	10.0	10.0	10.0
Public/Quasi-Public	16.7	16.7	16.7	16.7	16.7	16.7

TABLE D-8

AVERAGE AND EQUIVALENT ANNUAL DAMAGES WITHOUT PROJECT*

Land Use	1980	1990	2000	2010	2020	2030-2080	Equivalent Annual
Residential							
Structures	22.0	22.0	22.0	22.0	22.0	22.0	22.0
Contents	9.0	11.4	14.5	18.4	21.2	21.2	12.7
Sewage Treatment Plant	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Commercial and Public	6.3	6.3	6.3	6.3	6.3	6.3	6.3
Public Utilities	4.1	4.1	4.1	4.1	4.1	4.1	4.1
Emergency Costs	46.0	46.0	46.0	46.0	46.0	46.0	46.0
TOTAL	90.9	93.3	96.4	100.3	103.1	103.1	94.6

TABLE D-9

EQUIVALENT ANNUAL RESIDUAL DAMAGES BY ALTERNATIVE*

	Levee	Channel Clearing	Floodproofing
Residential			
Structures	1.4	12.0	0.5
Contents	0.5	5.0	0.2
Sewage Treatment Plant	0.1	2.6	0.1
Commercial & Public	.4	4.8	0.1
Public Utilities	0.2	3.0	0.1
Emergency Costs	4.0	34.6	1.4
TOTAL	6.6	62.0	2.4

*Values in thousands of dollars at January 1980 price levels, 100-year period of analysis at 7-1/8% discount rate.

TABLE D-10

EQUIVALENT ANNUAL DAMAGES PREVENTED BY ALTERNATIVES*

	Levee	Channel Clearing	Floodproofing
Residential Structures	20.6	10.0	21.5
Contents	12.2	7.7	12.5
Sewage Treatment Plant	3.4	0.9	3.4
Commercial & Public	5.9	1.5	6.2
Public Utilities	3.9	1.1	4.0
Emergency Costs	42.0	11.4	44.6
TOTAL	88.0	32.6	92.2

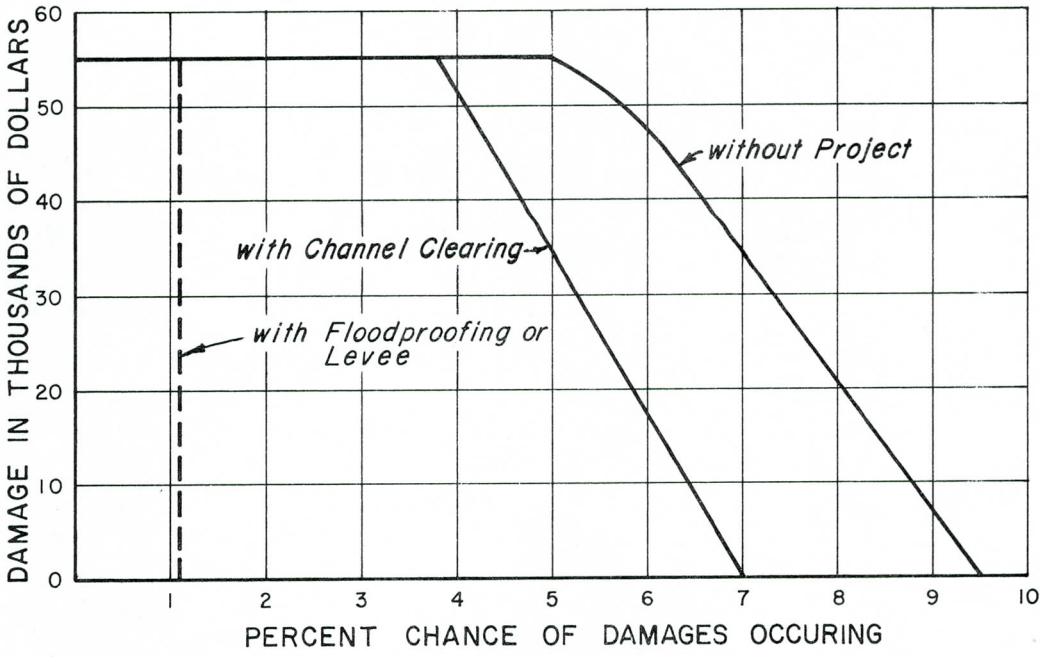
*Values in thousands of dollars at January 1980 price levels, 100-year period of analysis at 7-1/8% discount rate.

TABLE D-11

AVERAGE ANNUAL BENEFITS FOR RELOCATION*

Externalized Flood Damages Reduced		
Residential Damages		
Structures	22,000	
Contents	12.700	
	34,700	
Less Deductibles	2,700	
		32,000
Commercial, Public & Quasi-public		
Damages	6,300	
Less Deductibles	400	
		5,900
Reduction of Emergency Costs		46,000
Reduction of Flood Damages to Public Utilities		4,100
		88,000

*Values indicate January 1980 price levels, 100-year period of analysis using 7-1/8% discount rate.



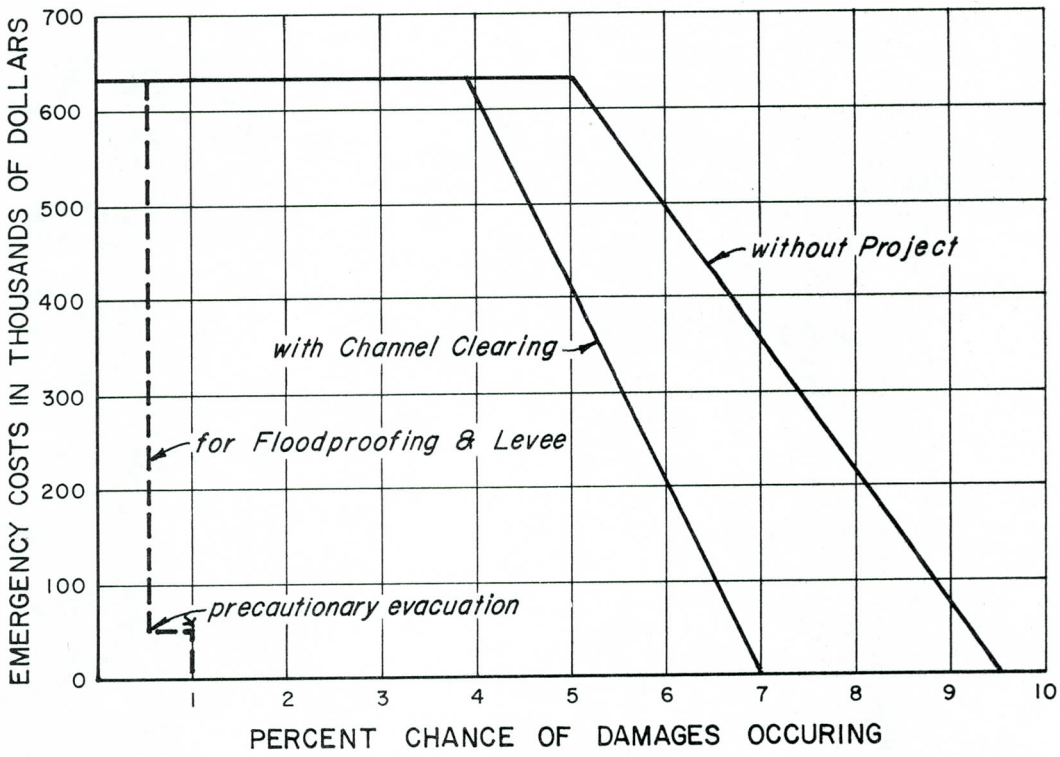
ALLENVILLE, ARIZONA

DAMAGE FREQUENCY CURVES

PUBLIC UTILITY DAMAGES

U. S. ARMY ENGINEER DISTRICT
LOS ANGELES
CORPS OF ENGINEERS

APPENDIX D PLATE 1



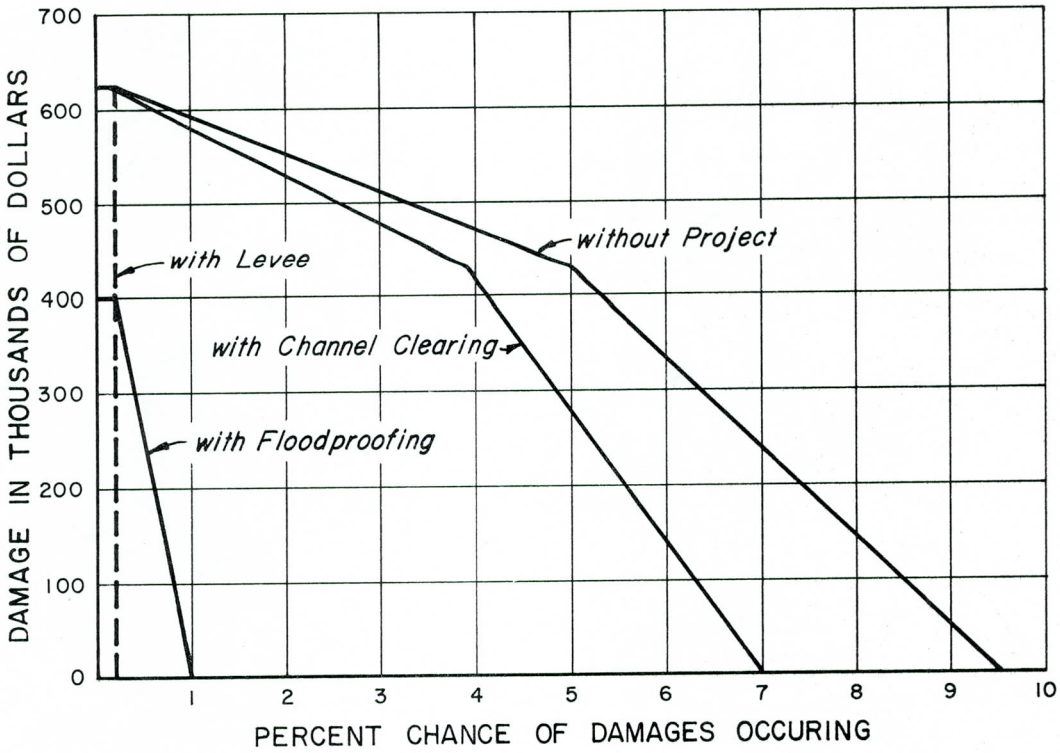
ALLENVILLE, ARIZONA

DAMAGE FREQUENCY CURVES

EMERGENCY COSTS

U. S. ARMY ENGINEER DISTRICT
LOS ANGELES
CORPS OF ENGINEERS

APPENDIX D PLATE 2



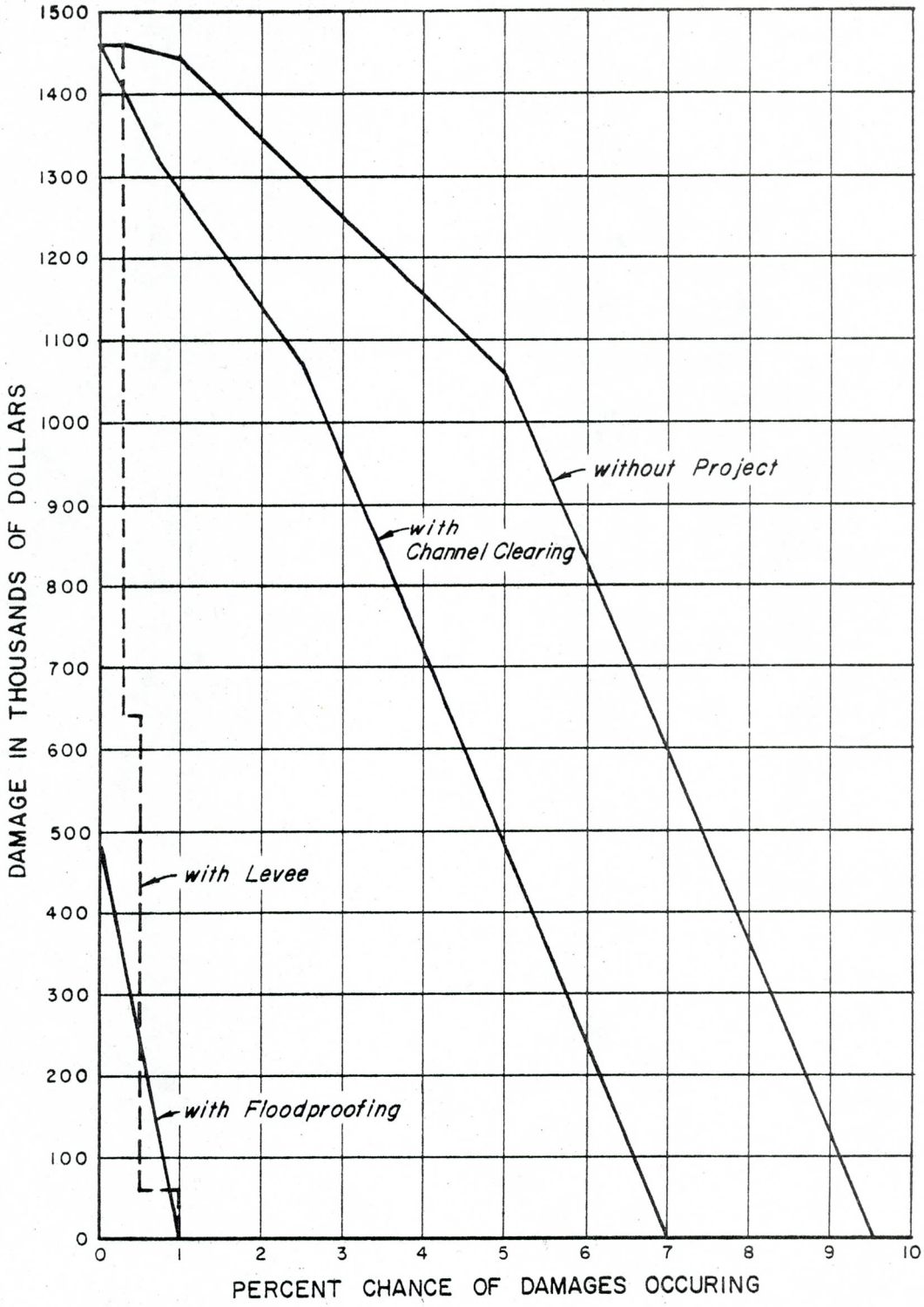
ALLENVILLE, ARIZONA

DAMAGE FREQUENCY CURVES

TOTAL DAMAGES

U. S. ARMY ENGINEER DISTRICT
LOS ANGELES
CORPS OF ENGINEERS

APPENDIX D PLATE 3



ALLENVILLE, ARIZONA

DAMAGE FREQUENCY CURVES

TOTAL DAMAGES

U. S. ARMY ENGINEER DISTRICT
LOS ANGELES
CORPS OF ENGINEERS

APPENDIX D PLATE 4

APPENDIX E

221 AGREEMENT AND LETTER OF INTENT

AGREEMENT BETWEEN

UNITED STATES OF AMERICA

AND

STATE OF ARIZONA

FOR LOCAL COOPERATION AT

ALLENVILLE, ARIZONA

THIS AGREEMENT entered into this _____ day of _____, 19_____, by and between the UNITED STATES OF AMERICA (hereinafter called the "Government"), represented by the Contracting Officer executing this agreement, and the STATE OF ARIZONA, acting by and through its Division of Emergency Services (hereinafter called the "State"),

WITNESSETH THAT:

WHEREAS, the relocation of the community of Allenville, Arizona, from the Gila River floodplain as a nonstructural flood-control measure, is proposed by the Government under authority of Section 205 of the Flood Control Act of 1948, as amended (33 U.S.C. 701s) and Section 73 of the Water Resources Development Act of 1974 (Public Law 93-251), such relocation to be accomplished in conformity with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 91-646); and

WHEREAS, the extent of participation proposed by the Government is as set forth in the Detailed Project Report titled "Detailed Project Report for Flood Control at Allenville, Arizona," approved by the Chief of Engineers, U. S. Army, on _____; and

WHEREAS, the State hereby represents that it has the authority and capability to furnish the non-Federal cooperation required by the aforesaid statutory authority and in the aforesaid Detailed Project Report.

NOW, THEREFORE, the parties agree as follows:

1. The State agrees that, upon notification that the Government will commence to participate in the relocation of the community of Allenville, Arizona, as set forth in the aforesaid Detailed Project Report, the State shall, in consideration of the Government commencing such project, fulfill the requirements of non-Federal cooperation and participation, to wit:

a. Provide without cost to the United States all lands, easements, and rights-of-way necessary for the construction of the project. This subparagraph shall be construed to mean that the State will acquire unencumbered fee title to all designated real property within the floodplain and at the replacement housing site and administer the relocation assistance program under Public Law 91-646.

b. Hold and save the United States free from damages due to the construction works except those damages due to the fault or the negligence of the United States or its contractors. This subparagraph shall be construed to apply to the razing of existing structures within the floodplain and construction of the replacement housing and other related facilities.

c. Maintain and operate the works after completion in accordance with regulations prescribed by the Secretary of the Army. This subparagraph shall be construed to apply to the lands acquired within the floodplain and to the replacement housing and related facilities until sold or conveyed as hereinafter provided. The operation and maintenance of the park, community center, water supply/distribution system and streets at the relocation site will remain the responsibility of the local sponsor although the local sponsor may elect to enter into such agreements to transfer authority for operation and maintenance of these features to appropriate local government and/or community organizations.

d. Contribute 20 percent of the sharable costs of the project provided that the Government's share of the first costs shall in no event exceed the statutory limitation of $3,000,000 (33 U.S.C. 701s) and the State shall bear 100 percent of all first costs in excess of $3,562,000. First costs and sharable costs shall be as defined or indicated in the aforesaid Detailed Project Report in which the State's initial contribution is currently estimated at $1,855,000. The State's estimated net expenditure is currently estimated at $857,000 including unshared additional State contributed relocation benefits. All costs shall, however, be computed on the basis of actual costs and not on the basis of estimates in the aforesaid Detailed Project Report. Such contributions shall be made by the State upon the request of the Government.

e. Maintain books, records, documents and other evidence pertaining to costs and expenses incurred in the project to the extent and in such detail as will properly reflect all net costs of whatever nature involved therein. The State shall make available at its offices at reasonable times, the accounting records for inspection and audit by an authorized representative of the Government.

f. Sell or rent houses constructed by the Government, preference being given to former residents at Allenville, at no less than fair market value as established by a qualified real estate appraiser and approved by the Government and convey title to any public facilities constructed by the Government to the appropriate public or quasi-public entity as approved by the Government.

g. Sell all houses constructed by the Government at not less than fair market value within 5 years of the date of completion of the project or pay, in accordance with the succeeding subparagraph, the appropriate share of the fair market value of the houses to the Government as if the houses had been sold.

h. Submit an appropriate accounting to the Government by the 15th of March of each year and pay 80 per cent of the gross proceeds of sales and rentals of houses constructed by the Government, without interest, for the preceeding calendar year; except that, if the total first costs of the project exceed $3,562,000 , the State shall deduct from the amount payable all such proceeds up to the amount of first costs in excess of $3,562,000.

i. Comply with Sections 202, 203, 204, 205, 301, 302, 303, and 304 of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 91-646) and any other provisions thereof applicable to State agencies.

j. Comply with Section 601 Title VI of the Civil Rights Act of 1964 (Public Law 88-352) to the end that no person shall be excluded from participation in, denied the benefits of or subjected to discrimination in connection with the project on the grounds of race, creed, or national origin.

2. After acquisition, the State may divest itself of fee title to the lands within the floodplain provided the right is reserved to raze or salvage all existing improvements and the lands are impressed with permanent restrictions deemed necessary or desirable by the Government for floodplain management, including, but not limited to, the barring of any form of future Federal disaster relief for damages resulting from flooding.

3. The Government shall credit or reimburse (without interest) the State for its participation only upon receipt of properly certified invoices, in quadruplicate, supported by such evidence of payment as may be required by the Government and upon approval of the work performed or the sufficiency of the real estate interests acquired by the Government. Such invoices must be submitted within one calendar year from the date of completion of the project, as determined by the Government.

4. Upon completion of construction of the project, as determined by the Government, title to all houses and any other related facilities constructed by the Government at the replacement site shall vest in the State and the State shall assume all management and maintenance responsibility therefor.

5. The State hereby gives the Government a right to enter, at reasonable times and in a reasonable manner, upon land which it owns or controls, for access to the project for the purpose of razing floodplain structures, construction, inspection, and for the purpose of operation, repairing, managing or maintaining the project, if inspection shows that the State for any reason is failing to operate, manage, and maintain the project in accordance with the assurances hereunder and has persisted in such failure after a reasonable notice in writing by the Government delivered to Governor of the State. No operation, management and maintenance by the Government in such event shall relieve the State of responsibility to meet its obligation as set forth in paragraph 1 of this agreement, or to preclude the Government from pursuing any other remedy at law or equity.

6. This agreement is subject to the approval of the Secretary of the Army.

IN WITNESS WHEREOF, the parties hereto have executed this agreement as of the day and year first above written.

UNITED STATES OF AMERICA

By_____
Colonel, Corps of Engineers
District Engineer
US Army Engineer Dist, LA
Contracting Officer

DATE_____

STATE OF ARIZONA

By_____

Title_____

DATE_____

APPROVED:

FOR THE SECRETARY OF THE ARMY

By_____

DATE_____

CERTIFICATE OF STATE ATTORNEY GENERAL

The undersigned, having considered all of the provisions of the foregoing Agreement and the effect of Section 221 of the Flood Control Act of 1970, 84 Stat. 1818 (Public Law 91-611), approves the foregoing Agreement as to form, substance, and legality.

_____

DATE_____

CERTIFICATE OF AUTHORITY

I, ____(typed or printed name)____, do hereby certify that I am the ___(title)___ of ___(local sponsor)___ that the ___(local sponsor)___ is a legally constituted public body with full authority and capability to perform the terms of the agreement between the United States of America and ___(local sponsor)___ in connection with _____ (name of project), and to pay damages, if necessary, in the event of the failure to perform in accordance with Section 221 of Public Law 91-611 and that the person(s) who have executed the contract on behalf of ___(local sponsor)___ have acted within their statutory authority.

In Witness Whereof, I have made and executed this Certificate this _____ day of _____, 19_____.

(Seal, if necessary)

_____

Typed or Printed Name and Title

(Acknowledgement, if necessary)

STATE OF ARIZONA

BRUCE BABBITT
GOVERNOR

CHARLES A. OTT, JR.
DIRECTOR

DIVISION OF EMERGENCY SERVICES
5636 EAST McDOWELL ROAD
PHOENIX, ARIZONA 85008
TEL. (602) 273-9880

December 10, 1979

Mr. Neil Erwin
Allenville Project Manager
U.S. Army Corps of Engineers
2721 N. Central
Phoenix, Arizona 85004

Dear Mr. Erwin:

I have read the draft 221 Agreement dated December 7, 1979. This letter is to inform you that the Division of Emergency Services intends to participate in this project as the local sponsor as provided by that agreement.

Sincerely,

Charles A. Ott, Jr.
Director

PFH:tm

ENVIRONMENTAL ASSESSMENT

ALLENVILLE FLOOD DAMAGE REDUCTION STUDY

ENVIRONMENTAL ASSESSMENT

ALLENVILLE FLOOD DAMAGE REDUCTION STUDY

Maricopa County, Arizona

The responsible agency is the U.S. Army Engineer District, Los Angeles.

ABSTRACT

Allenville, Arizona is a small community located on the Gila River 1.5 miles south of Buckeye and 35 miles west of Phoenix. Residents of Allenville are currently living in a mobile home park developed with Department of Housing & Urban Development (HUD) funds and designed as temporary housing after the flood of March 1978. The community is waiting for the State to provide assistance in relocation of Allenville or some alternative flood protection measure.

The Division of Emergency Services of the State of Arizona has requested the Army Corps of Engineers to investigate the flood problems of Allenville with a view toward assistance in the relocation of the residents.

A number of alternatives was initially considered by the Los Angeles District Office of the Corps of Engineers, and four were studied in more detail. The four alternatives included: channel clearing, a ring levee, flood proofing by raising the community, and relocation of the residents out of the floodplain. A no action plan was also evaluated. Permanent evacuation of the residents, either individually or as a community, is the only alternative that appears to be economically justified. Relocation of the community is the alternative favored by local residents.

SUMMARY

Major Conclusions and Findings: The tentatively selected alternative, relocation of Allenville as a community, has net benefits to both the National Economic Development (NED) and Environmental Quality (EQ) accounts, and has significant positive contributions to the social-well-being account. Three types of relocation were considered. Relocation of structures was not found to be feasible. Both individual and community relocations were economically justified and provided full flood protection for the residents of Allenville. However, individual relocation would have a significant adverse effect on the residents of Allenville as a result of increased financial burdens and the destruction of the community structure. The community relocation has no significant environmental effects and will have positive contribution to the EQ account if the old site, after relocation, is restored to its natural condition for wildlife purposes.

Areas of Controversy: No major controversies have been identified from State, local, or Federal agencies, or the residents of Allenville concerning the relocation. Most residents favor the relocation to the new site and everyone has accepted the need to move. Several areas of

concern, however, were raised by non-Allenville residents of the Buckeye Valley at a public meeting on April 2, 1980.

Unresolved Issues: Currently there are no significant issues that remain unresolved. All public concerns have been addressed in this assessment. Members of the Allenville community were apprised of the potential impacts of the relocation and expressed no major concerns. Although there may be continuing objections from a few residents of the Buckeye area, none of the potential impacts of the relocation are considered to be significant.

NEED FOR AND OBJECTIVE OF THE ACTION

Study Authority: The Corps of Engineers is pursuing this study under a small project authority at the request of the State Division of Emergency Services.

A Corps study of the Salt and Gila Rivers flood problems in 1957, resulted in an authorized project. The project was never implemented due to the authorization of the Central Arizona Project (CAP), a Water and Power Resources Service (formerly Bureau of Reclamation) project. A feature of CAP, Orme Dam, would provide flood control for the Salt and Gila Rivers. When Orme Dam was deleted from CAP by presidential directive, the Service, with assistance from the Corps, initiated a study of alternatives for Orme, the Central Arizona Water Control Study (CAWCS). Although Allenville is within the area affected by this project, study results will not be known for at least two years. Preliminary indications are that none of the alternatives will be of help to the Allenville area.

Public Concerns: Public views on the project have come primarily from the residents of Allenville and their neighbors in the Buckeye Valley. The overriding concern of Allenville residents is to be able to return to a permanent home quickly. The residents have been flooded three times in 24 months. Since March of 1978, they have been living in mobile homes provided originally by HUD, but now owned by the State of Arizona. Some families had returned to their homes when the flood of December 1978 occurred. Some residents again returned to their homes after the 1978 floods, although most remain in the trailers, waiting for assistance from the State in solving the flooding problem. All the residents are anxious for a solution.

The State Division of Emergency Services is also concerned that a timely solution be found. The residents will not continue to live in the trailers indefinitely, and those who might return to their homes face the threat of more flooding.

Socio-economic conditions in Allenville have been such that a close-knit community has been formed. Although a few of the families are reluctant to move, it is obvious that there is strong cohesion among the residents. They do not wish to be separated. The fact that they own the homes and the land they live on is very important to the residents of Allenville. The residents also are concerned about incurring increased debt as a result of the relocation. Concerns raised by non Allenville residents of the Buckeye Valley included land use conflicts, potential

safety and noise problems due to the proximity of the Buckeye Municipal Airport, spraying of pesticides adjacent to the relocation site, quality of available drinking water, potential effects of increasing the student population of Palo Verde Elementary School, and potential transportation problems for residents due to the increased distance to Buckeye.

Planning Objectives: The objectives to be considered when planning a flood control solution for Allenville have evolved through discussions with local residents individually and in public meetings and workshops. They include the following:

Providing flood protection for the residents of Allenville;

Maintaining community cohesion;

Improving drinking water quality;

Providing recreational facilities for the residents of Allenville;

Minimizing adverse impacts on cultural resources;

Enhancing fish and wildlife resources.

ALTERNATIVES

Plans Eliminated: Allenville is within the study area of the Central Arizona Water Control Study, and a number of structural and nonstructural measures were being considered as part of the project. Preliminary studies have eliminated these measures from further consideration by the Allenville study. The most ambitious plan for upstream storage would not provide adequate protection for Allenville. Plans for extensive channel or levee systems do not appear to be economically justified. Channel clearing is not justified and does not provide significant reduction in damages. The issue of channel clearing has been mired in environmental problems since the 1957 Interim Report. Even if any of these measures provided significant protection, implementation still would not begin for several years. For these reasons it was decided that alternatives separate from those being considered for the CAWCS would be developed for the protection of Allenville.

Four alternatives and combinations thereof were developed to provide flood protection for Allenville. These included: channel clearing only in the vicinity of Allenville; flood proofing Allenville by raising the elevation of the town; construction of a ring levee around Allenville; and relocation of Allenville residents out of the floodplain. Of the four alternatives, relocation of the entire community to a new site is the only alternative that appears to be economically viable and socially and environmentally acceptable.

Future Without Project Conditions: The State of Arizona Division of Emergency Services received funds from HUD for the purpose of relocating three communities. Funds were not adequate to complete more than one relocation without additional support. Because of this serious funding

constraint, lack of participation by the Corps could result in the abandonment of plans to relocate the community of Allenville. The residents would ultimately return to their homes, and continue to be susceptible to flood damages.

Plans in Detail: The only alternative which appears to be economically justified and which provides flood protection is the relocation of the residents of Allenville. Three types of relocation were studied; relocation of the existing structures to a new site; relocation of individuals into existing housing and relocation of the community to a new site.

Selected Plan: The selected plan calls for the permanent relocation of Allenville out of the Gila River floodplain, and the construction of a new community on a 60 acre tract of land near I-10 and Palo Verde Road. Initially, floodplain land was to be exchanged for School Trust lands in accordance with the State Omnibus Flood Control Act. Several alternative locations of state land were presented to Allenville community leaders and the recommended site was chosen. As a result of problems with the land exchange, the State Division of Emergency Services will now purchase the land and exchange it for floodplain lands in Allenville. This would allow other possible relocation sites to be studied, but with a delay of several months in the project schedule. Allenville community leaders requested that to avoid delays no new relocation sites be studied.

The relocation site is undeveloped, although it is currently under lease to agricultural interests, and is adjacent to cultivated land. Short-term future land use most likely would be agriculture. Because of the proximity of the relocation site to I-10 and Buckeye Airport, long-term future land use could be commercial/industrial.

The Division of Emergency Services has contracted an architect-engineer firm which has completed preliminary designs and cost estimates. The new community will consist of twenty single-family dwellings ranging from one to four bedrooms on lots of either one acre or approximately one-third acre. The new homes are to be comparable to those now located in Allenville, but will meet HUD standards for safety, decency, and sanitation. Current designs also include facilities for twenty mobile home lots. The mobile homes originally were intended to serve as a means to allow renters from Allenville to remain with the community. These renters do not, for the most part, have the financial resources to obtain standard housing. The Division of Emergency Services, therefore, intends to make the HUD obtained temporary housing units available for purchase by displaced renters. The possibility of constructing an apartment complex for all or some of the twenty families who could not afford single family housing was explored, but was unanimously opposed by the families involved. Eleven households have elected to move.

Also included in the relocation plan are a County pa.. and a community center. Design of these facilities was based on replacement of features and square footage of existing items in Allenville. Locations for two churches, a Masonic Lodge Hall, and a tavern are planned, but these structures will not be built by the Corps.

The future land use of the present site of Allenville will be constrained because it will consist of a patchwork of lots. At this time it appears that only lots with structures will be acquired. Provisions in the 221 Agreement between the Corps and the State for the relocation of Allenville will prohibit development of the property which does not conform to Federal floodplain management goals. County zoning ordinances will severely restrict construction if the land ever is conveyed to public ownership. A clause in the 221 Agreement prohibits any future Federal assistance for flood damages in such an event. At the present time, arrangements are being made to transfer the land to the State Department of Game and Fish to be managed for wildlife purposes.

AFFECTED ENVIRONMENT

During the plan formulation, environmental as well as economic studies of four alternatives were performed. Although only relocation of residents, individually or as a community, proved economically justified, the sections, AFFECTED ENVIRONMENT and IMPACTS OF ALTERNATIVES, will describe the resources that could potentially be effected by all four alternatives.

Physiography

Allenville is located 1.5 miles south of Buckeye in the 100 year floodplain of the Gila River. The relocation site is eight miles northwest of Buckeye on a gradually sloping desert outwash plain rising gradually northward from the Gila toward the White Tank Mountains. The area is part of the Desert Region of the Basin and Range Province.

The Salt and Gila Rivers traverse the area, exhibiting distinctly braided channel patterns. Alluvial material contributes to the highly mobile channel, which shifts with successive flows. The rivers are heavily vegetated, presenting resistance to flood flows, and increasing channel mobility. The channels and floodplain are wide and extensively developed in Phoenix, and more sparsely developed near Buckeye. Agriculture is the principal activity in the non-urbanized portions of the study area. Sand and gravel mining is done along the rivers in the region. At present there is a sand and gravel plant operating in the Gila River immediately adjacent to Allenville.

Water Quality

The major sources of surface water in the Gila River near Allenville are treated sewage effluent and irrigation tailwater. Presently, the effluent is discharged from the 23rd Ave. and 91st Ave. treatment plants after secondary treatment without disinfection. Partially as a result of the effluent dominated flows, ground water quality declines sharply in the vicinity of the Gila River. Wells in the vicinity of Allenville, including the well currently serving the community, do not meet minimum drinking water standards. Allenville's well has been condemned by the Maricopa County Health Department for domestic use, but some residents continue to use the water for drinking. Wells further removed from the river, including those in the vicinity of the new site, do meet minimum drinking water standards, based on January 1979 tests by Arizona Department of Health Services.

Water quality test results indicate that the new water source will supply water which has a higher concentration of fluorides than the old Allenville site. All other reported constituents will show a marked improvement over the old site. (See Table 1.) The concentrations of the fluorides and nitrates at the new site are both high and do approach the maximum allowable standards of the U.S. Environmental Protection Agency. However, the test results indicate that both of these constituents were within acceptable limits when the water was last tested. There may be an influence on the new site ground water quality during heavy irrigation periods. However, this influence is not expected to significantly lower the water quality at the new well site.

Air Quality

Both the new and old sites for Allenville are located within Maricopa County Urban Planning Area, which has been designated a non-attainment area for carbon monoxide (CO), ozone, and total suspended particulates (TSP), based on monitored or modeled air quality levels.

The primary pollutants to be considered in a discussion of the new Allenville site are lead, TSP, and carbon monoxide (CO) associated with motor vehicle traffic on I-10. Although no site-specified data are available, TSP and lead data have been collected at Buckeye. A summary of the data collected in 1978, as well as the respective State and Federal standards, are presented in Table 2. These data show that at Buckeye in 1978 the lead concentrations were well below the calendar quarter average standard of 1.5 micrograms per cubic meter (ug/m^3). All of the State and Federal TSP standards were exceeded in 1978.

The State and Federal CO standards, as noted below, are not to be exceeded more than once a year.

1 - Hour average: 40 milligrams per cubic meter (mg/m^3)

3 - Hour average: 10 mg/m^3.

No CO data are available from the Buckeye area, but extrapolation of modeled data from the Phoenix metropolitan area imply that eight-hour average CO concentration in the Buckeye area is probably less than 1 mg/m^3. There are no other considerations that would indicate that this is not the case.

Noise

Allenville is surrounded by either undeveloped land or agricultural land, and as such is subject to normal residential noise levels. The new site for Allenville is located within a half mile of the I-10 highway, and the Buckeye airport. Noise levels associated with these facilities are low at the present time.

The major noise source in the general vicinity of the new site is operation at Buckeye Municipal Airport. Buckeye Municipal Airport is a city-owned general aviation facility used largely by small, single-engine, piston driven planes. Operations for 1979 totaled 6,000 and peak monthly

TABLE 1

GROUND WATER QUALITY COMPARISON
ALLENVILLE AND PROPOSED ALLENVILLE SITE

Location	Units	Allenville	Near New Site	Drinking Water Standards
Designation		(C-1-3)8-2	(B-1-4)8-1	
Owner		Allenville	Garcia Water Co.	
Date Tested		09-15-79	06-09-75	
Depth to Static Water Level	Ft	Less than 50	200	
Total Dissolved Solids (Residue)	mg/l	7349	192	Less than 500
Hardness (As $CaCO_3$)	mg/l	2570	50	Less than 170
Specific Resistance	ohms.	Less than 400	3200	NNS
pH		7.3	8.3	6.5 - 8.5
Calcium	mg/l	732	16	NNS
Magnesium	mg/l	178	3	NNS
Sodium	mg/l	292	69	NNS
Alkalinity (As $CaCO_3$)	mg/l	246	126	NNS
Chloride	mg/l	2660	12	250
Nitrate	mg/l	33	9	10
Sulfate	mg/l	1500	18	250
Fluoride	mg/l	0.70	1.0	1.4

NNS. - No Numerical Standard

Source: Maricopa County Department of Health Service, 1979
U.S. Environmental Protection Agency, 1979

TABLE 2

ATMOSPHERIC LEAD AND TSP DATA SUMMARY
AND
RELATIVE AIR QUALITY STANDARDS

Buckeye, Arizona
1978

Lead:

Annual Average:	0.40 ug/m^3
Calendar Quarter Averages:	Maximum: 0.49 ug/m^3
	2nd High: 0.31 ug/m^3
Number of Samples:	38
State and Federal Standards:	
Calendar Quarter Average:	1.5 ug/m^3

TSP:

Annual Geometric Mean:	166 ug/m^3
24-Hour Averages:	Maximum: 1036 ug/m^3
	2nd High: 358 ug/m^3
Number of Samples:	83

State and Federal Standards:

	Annual Geometric Mean	24-Hour Average
State	75 ug/m^3	150 ug/m^3[a]
Federal Primary	75 ug/m^3	260 ug/m^3
Federal Secondary	60 ug/m^3	150 ug/m^3[a]

[a] Not to exceed more than once per year.

operations totaled 600. Approximately 95 percent of all flights occur along the north-to-south runway, with remaining operations divided equally between the southwest-northeast and the southeast-northwest runways. These runways are used only under strong crosswind conditions. Normal operations total a maximum of five to six flights per day on weekdays, and a maximum of 75 flights occurring per weekend day.

Existing operational day-night sound levels fall within the range of 44-45 decibels (db) throughout the relocation site. HUD site acceptability standards define a sound level of 65 db to be "acceptable for residential construction."

Future plans for the Buckeye Municipal Airport are presently under consideration with final adoption not anticipated until later in 1980. An increase in airport traffic, however, is expected. If fueling facilities are constructed as planned, the airport will probably be expanded to accommodate small business jets.

Cultural Resources

A cultural resource study covering Allenville, the relocation site, and 10 miles of the Gila River channel, was conducted by Archaeological Research Services, under contract to the Corps of Engineers. The study consisted of a literature search of historic and archaeological site files, and a field survey of the new site. No surface remains of cultural resources were found at the new site. No cultural resources have previously been identified in the vicinity of the new site. The existence of heavy growth and recent silt deposits precluded a field survey of the old site. Archaeological site records indicate that four prehistoric archaeological sites have been recorded within one-half mile from the east edge of Allenville. These sites are listed and identified in Table 3 below.

TABLE 3

ARCHAEOLOGICAL SITES IN THE VICINITY OF ALLENVILLE

Site Designation	Site Type	Site Location
AZ T:10:45 (ASU)	Surface Sherd and Lithic Scatter	NW, SW, SE, Sec. 8, T1S, R3W
AZ T:10:2 (MNA)	Surface Sherd and Lithic Scatter	NE, SW, SE, Sec. 8, T1S, R3W
AZ T:10:3 (MNA)	Surface Sherd and Lithic Scatter	NE, SW, SE, Sec. 8, T1S, R3W
AZ T:10:44 (ASU)	Lithic Scatter	SE, SE, SE, Sec. 8, T1S, R3W

These sites are attributed to the prehistoric Hohokam, based on the presence of Gila Plain and Sacaton Red-on-buff ceramic types. In addition, several other archaeological sites have been recorded on both sides of the Gila River in the general Buckeye-Buckeye Hills vicinity.

Based on the presence of prehistoric archaeological sites in the immediate vicinity of Allenville, it is reasonable to assume that such resources are located within the 160-acre community. In the event that proposed building demolition procedures involve the disturbance of the existing ground surface to a depth greater than six inches, an archaeological test excavation program would be conducted in order to determine if such buried archaeological sites do, in fact, exist.

None of the present buildings at Allenville are of historical or architectural significance.

A number of archaeological and historical sites exist along the edge of the Gila River floodplain in the 10 mile stretch studied for the channel claring alternative. Based on a literature search and on-site field investigation, 18 sites, both historic and prehistoric, were identified. These are listed in Table 4.

Biological Resources

Allenville is located adjacent to the Gila River. Three saline-alkali soil series form the general soil types; Avondale clay loam, Gilman loam, and Gilman fine sandy loam. These soils are deep well-drained alluviums that exhibit heavy surface salt encrustations (U.S. Dept. of Agriculture, 1977). The salinity contributes to the establishment of salt tolerant plant species such as seepweed, iodine bush, saltbush, and saltcedar. The plant life consists of phreatophytic species that are dependent on perennial soil moisture, and desert floodplain species that rely directly on the precipitation regime.

The area around Allenville is dominated by plant species that are well suited to colonizing land which has been cultivated or flooded. Seepweed and saltcedar plant associations comprise the bulk of the vegetative cover.

The saltcedar association occurs along the eastern and southern edges of Allenville. The remaining area is covered by the seepweed association, intermixed with saltbush, iodine bush, greasewood, and saltgrass, to form an open shrubland. Areas now occupied by the seepweed association will eventually change to saltbush, except in the areas to the north and east of Allenville that receive highly saline irrigation tailwater.

The plant associations at Allenville support a variety of vertebrate species. Saltbush and other shrubs provide food and cover for pocket mice, deer mice, and hispid cotton rats. Birds of prey (raptors) such as Cooper's hawk, marsh hawk, and red-tailed hawks are probable occupants of the area and prey on the rodents. Other birds which utilize the seepweed habitat include Gambel's quail, black-tailed gnatchater, Leconte's thrasher, and the sage thrasher. The desert cottontail and coyote are present in both seepweed and saltbush associations. Mature saltcedar provide breeding habitat for large numbers of white-winged and mourning doves (Dames & Moore 1979).

The relocation site is located on a gently sloping southwest-exposed bajada which originates in the White Tank Mountains. Deep, well-drained

TABLE 4

IDENTIFICATION OF CULTURAL RESOURCES
WITHIN THE CHANNEL CLEARING STUDY AREA

Site Designation	Site Type	Site Location	Site Status*
AZ T:10:45 (ASU)	Surface Sherd and Lithic Scatter	NW, SW, SE, Sec. 8, T1S, R3W	P
AZ T:10:3 (MNA)	Surface Sherd and Lithic Scatter	NW, SW, SE, Sec. 8, T1S, R3W	P
AZ T:10:3 (MNA)	Surface Sherd and Lithic Scatter	NE, SE, SE, Sec. 8, T1S, R3W	P
AZ T:10:44 (ASU)	Lithic Scatter	SE, SE, SE, Sec. 8, T1S, R3W	P
AZ T:10:10 (ASM)	Surface Sherd and Lithic Scatter	E½, SE½, Sec. 17, T1S, R3W	P
AZ T:10:11 (ASM)	Surface Sherd and Lithic Scatter	NE, NW, SE, Sec. 16 T1S, R3W	P
AZ T:10:43 (ASU)	Surface Sherd and Lithic Scatter	SW, SW, NW, Sec. 15 T1S, R3W	P
AZ T:10:13 (ASU)	Hohokam Habitation Site	SE, SEc. 9 & SW. Sec. 10, T1S, R3W	P
AC 11:4 (GP)	Hohokam Habitation Site	NE, Sec. 12, T1S, R3W & NW Sec. 7, T1S, R2W	P
AZ T:11:18 (ASM)	Surface Sherd and Lithic Scatter	NW, SE, SE, Sec. 7, T1S, R2W	P
AZ T:10:9 (ASU)	Surface Sherd and Lithic Scatter	Se, NE, NE, Sec. 11, T1S, R3W	P
Historic 1	House	W½, NE, NW, Sec. 16, T1S, R3W	NP
Historic 2	House	NE, SW, SW, Sec. 10, T1S, R3W	NP
Historic 3	House	NE, NE, NW, Sec. 12, T1S, R3W	NP
Historic 4	House	NW, NW, NE, Sec. 8, T1S, R2W	NP
Historic 5	House	NE, SE, SE, Sec. 5, T1S, R2W	NP
Historic 6	House	NE, SE, SE, Sec. 5, T1S, R2W	NP
Historic 7	House	SE, SE, NE, Sec. 5, T1S, R2W	NP

* P (Present). NP (Not Present).

sandy loam soils, which typify the Antho, Perryville, and Coolidge-Laveen associations, occur through the entire site (U.S. Dept. of Agriculture, 1977).

Vegetation on the relocation site is composed of plants adapted to the aridity of the Sonoran desert uplands. The main components of the vegetation are creosotebush, triangle bursage, and white bursage, which are the dominate species of the creosotebush-bursage association. At the elevation of the new site, the creosotebush-bursage intergrades with the paloverde-cacti community. Some scattered paloverde and ironwood trees, and saguaro and barrel cacti also occur on the site. A count of the trees and large cacti yielded the following: 32 little-leaf paloverde, 15 ironwood, 3 saguaro, 4 barrel cacti and 4 saltcedar shrubs. Land bordering the eastern edge of the site is under cultivation, and the plant species associated with such a modification, Russian thistle, cheesebush, and burroweed, are represented on the site. Mediterranean and Arabian grass, big galleta, Indian wheat, and fillaree make up much of the cool-season cover.

The reptiles, birds, and mammals that occur on the site are desert dwelling species. Desert whiptail lizards, desert horned toads, and diamond back rattlesnakes are probably present. The few saguaro on the site provide nesting sites for cactus wrens, Gila woodpeckers, and elf owls. Paloverde and ironwood provide forage and nesting habitat for a variety of desert songbirds such as the cactus wren and blacked-tailed gnatcatcher. Desert pocket mice, Merrian kangaroo rats, and white-throated wood rats probably utilize the fruits and seeds of the desert plants. Representative predators include marsh hawks, Cooper's hawks, coyotes, and possibly kit fox.

The vegetation in the proposed channel-clearing area is strongly influenced by the soils and water supply. Perennial flows in the area are maintained by effluent from the upstream waste-water treatment plants and irrigation tailwater. Soils are deep and somewhat excessively drained Carrizo and Brios series types (U.S. Dept. of Agriculture, 1977).

Saltcedar is the predominant vegetation in the Gila River channel between Rooks Road and Perryville Road. In the area south of Allenville, saltcedar occurs as shrubby growth composed mainly of young trees. Mature saltcedar woodland is not present here. Young cottonwood and willow trees grow in the saltcedar association along the channel, and saltbush and seepweed intermix. The riparian plant life is nurtured by near-surface groundwater.

Wildlife associated with the saltcedar are primarily songbirds and rodents. Herbaceous plants such as desert dicoria, alkali heliotrope, Johnson and Bermuda grasses, and yerba de tajo provide forage and cover for small wildlife, such as desert cottontail, kangaroo rat, and deer mouse. Predators such as the coyote, red-tailed hawk, and marsh hawk occur in the saltcedar habitat along this reach of the Gila River.

Aquatic habitat created by long-term flows supports numerous vertebrate species. The pools and sloughs created by flowing water support

many species which would otherwise be absent. In addition, species represented in upland and floodplain habitat, such as found at Allenville and the relocation site also occur in the channel clearing habitats.

Important Biota

Saltcedar woodlands are well-known as prime breeding habitat for white-winged dove. Mature saltcedar forests support higher densities of birds than do immature stands such as those near Allenville. However, even immature stands can attract appreciable numbers of nesting doves (Wigal, 1973), and so represent a valuable resource for this game species.

Other common game species include a variety of waterfowl, such as gadwall, mallard, and green-winged teal, as well as Gambel's quail and cottontail.

Endangered Species

The Yuma clapper rail, an endangered wildlife species, is known to occur in the Salt and Gila River channels in central Arizona (Dames and Moore, 1979). No Yuma clapper rails have been sighted in the channel clearing area near Allenville, although habitat in this reach is similar to that found in areas where sightings have been made.

Prime Farmland

The Soil Conservation Service (U.S. Department of Agriculture, 1978) identifies areas of particular soil characteristics with available irrigation water as prime farmland. The Soil Conservation Service defines prime farmland as land that is best suited for producing food, fiber, forage, feed, and oilseed crops, and is available for these uses. The land may currently be used for other purposes, but it may not be an area of urban buildup. The land also must have the soil quality, growing season, and moisture supply to produce sustained high crop yields economically by modern farming methods.

In addition to prime farmland, there are other areas which are important to agriculture for the production of food, fiber, forage, feed, and oilseed crops. However, there are some properties of the soil which exclude the area from being designated as prime farmland. Instead, these areas have been designated as additional irrigated farmland. These soils may be farmed satisfactorily to produce fair to good crop yields when managed properly.

Health & Safety

The relocation site is bordered on the east by agricultural land that is periodically sprayed with pesticides. The pesticides used are not highly toxic but do have an unpleasant odor. The existing location of Allenville is bordered on the north and west by agricultural lands that are subject to spraying.

The relocation site is located 11 miles from the Palo Verde Nuclear Generating Station. The site is outside the 10 mile buffer zone proposed by the Governor of Arizona for minimum development.

SOCIO-ECONOMIC CONDITIONS

Community Cohesion

Socio-economic conditions in Allenville have formed a close-knit community. There is strong cohesion among the residents, and they do not wish to be separated. The fact that they own the homes and the land they live on is very important to the residents of Allenville. The residents are concerned about incurring increased debt as a result of the relocation.

Demographics

The predominantly black community is composed of 51 households. There is a strong religious feeling as shown by the fact that this small community can support two churches. The local Masonic Lodge has been active in drawing membership from the Buckeye Valley. A State-supported child-care center provides a vital service to working community residents.

Age Distribution

About 26 percent of the population is over 60 years of age. The age groups under 18 and between 19 and 40 are represented respectively by 20 and 25 percent of the population as indicated in the following tabulation:

Age Group	18 & Under	19-40	41-50	51-60	Over 60
Percent of Population	20.3	24.5	15.3	13.8	26.1

This age distribution is fairly common in low-income minority communities, and is relatively indicative of a stable population base.

Employment

About half of the labor force in Allenville is employed in Buckeye or at the Palo Verde Nuclear Generating Station currently under construction. Only two individuals are employed in Phoenix. About one-eighth of the labor force is employed in the agricultural sector.

Real Income & Distribution

Allenville's median income is $7,073 yearly. One-third of the families earn incomes below poverty level. This compares with a median income of $9,853 and an 8.9 percent poverty rate in Maricopa County. Only seven families in Allenville earn annual incomes in excess of $12,000. A significant portion of the residents are retired on social security.

Housing

Housing in Allenville is varied. At the time of the December 1978 flood, there were 54 occupied dwelling units in the community. Owners

occupied 32 of these units and 22 families rented. Home sizes ranged from small shacks of a few hundred square feet to 2,200 square-feet block construction. Over half of the homes would be valued at less than $10,000. Only four or five would be valued as high as $40,000.

Land Use

Most of the residents of Allenville live in single-family dwellings. The community includes one tavern, a day-care center, and two churches. Local citizens also established a community center and a County park. Many of the single-family units in the community had vegetable gardens and chickens reflecting the strong local sentiment for the rural lifestyle.

The area south of the Gila River consists of Bureau of Land Management land leased for grazing, and the Gila River Indian Reservation. Land north of the Gila, surrounding Allenville and Buckeye, is either undeveloped or developed for agricultural use.

IMPACTS OF ALTERNATIVES

Physiography

Both the flood proofing alternative and the levee alternative would cause a significant change in the local physiography. Both alternatives would be esthetically unpleasing.

Water Quality

None of the alternatives will have a long-term significant effect on surface or groundwater quality or quantity. Clearing of the channel would have a temporary effect on surface water quality. The recommended plan - relocation as a community - does not involve waters of the United States and will not require a section 404(b) evaluation pursuant to Public Law 92-500.

Relocation to the new site will significantly improve the community drinking water supply. Based on tests of wells in the vicinity of the new site, the proposed well will meet minimum drinking water standards, and will provide an adequate supply of domestic water. Existing wells are approximately 500 feet deep with static water levels at less than 200 feet. The new well will be drilled to greater depth than existing wells, to insure that the community will continue to have a reliable source of water in spite of continued lowering of the water table. The actual depth of the new well will be determined by a test hole sampling program to insure that an adequate supply and quality of water is available at a greater depth. The depth and location of the well will also prevent contamination of the well by septic tanks associated with the new community.

Air Quality

Construction activities associated with all the alternatives will cause significant, but temporary local air quality impacts. In particular, TSP concentrations will increase because of stripping and earth-moving activities associated with levee construction, channel clearing, razing

of old Allenville, and building of the new community. The impact associated with the channel clearing alternative would be most severe; the individual relocation would be least severe. The community relocation will have moderate temporary effect on the air quality in the vicinity of the Allenville development, but the use of reasonable dust suppression techniques will lessen this impact. On a regional basis this impact is expected to be negligible.

Exhaust pollutants from the construction equipment will also adversely impact the air quality during the construction phase. The local and regional impacts of construction on air quality will not be significant.

Burning of the structures razed in old Allenville will be a significant temporary degradation of the local air quality. A permit for the burning will be acquired from the Maricopa County Health Department.

Noise

As a result of operations at Buckeye Airport, the day-night sound level at the proposed site is anticipated to be in the range of 44-45 db for maximum weekend operations along the north-south (N-S) runway. Take-offs on the southwest-northeast runway could result in a maximum day-night sound level at the western border of 61 db. Such activities would result in "moderate" exposure to residents based on FAA land use compatibility guidelines. Operations on the southwest-northeast (SW-NE) runway are limited. HUD's site acceptability standards for residential construction call for a day-night sound level of less than 65 db. The noise level that will be experienced by the residents of Allenville after relocation will be greater than the level at the old site, but should be acceptable.

The proposed expansion of Buckeye Airport will increase noise levels significantly over the present condition. For the site to remain compatible for residential development, some restrictions on the airport development will be required. A doubling of present operations will result in noise levels well within FAA acceptable limits. If the airport is expanded to serve small private jets, operations would have to be restricted to the N-S runway, with noise levels approaching 64 db. Operations involving small jets on the SW-NE runway would result in noise levels of 70-76 db. This would be unacceptable for residential development. Present plans indicate that the SW-NE runway will be abandoned. Development will center on the SE-NW runway, with no effect on the relocation site.

Vehicular traffic along I-10 and Palo Verde Road will contribute to the existing sound environment, but will be well below aircraft-generated sound levels.

Construction operations associated with all the alternatives could result in high noise levels; however, since the construction will take place in unpopulated areas, this impact is not considered significant.

*Telephone conversation with Steve Thompson, January 22, 1980 (See Reference).

Biological Resources

The flood proofing of Allenville, construction of a levee, and the destruction of the buildings in old Allenville would not result in significant impacts to the biological resources in the area. The vegetative and wildlife species involved are those that adapt to disturbed conditions, and should recover after construction is completed. The composition and quality of the resources would not be altered.

Little impact on biological resources is anticipated as a result of construction at the new site. Construction will take place in an area dominated by creosotebush-bursage; no significant biological resources will be involved. Saguaro cactus and mature little-leaf paloverde and ironwood trees will be preserved whenever possible. No biological effects would result from individual relocation.

Channel clearing is the only alternative that would cause significant environmental effects. The alternative would entail the clearing of 1,800 acres of saltcedar association in the Gila channel. Mature saltcedar woodlands are important prime breeding habitat for whitewinged doves. The stands near Allenville are immature, but still represent a valuable resource for the species. Habitat similar to that used by the Yuma clapper rail would be impacted by the channel clearing.

Endangered Species

Only the channel clearing alternative would have the potential to impact endangered species. The Yuma clapper rail, an endangered species, is known to occur in the Salt and Gila River channels in central Arizona. Although no Yuma clapper rails have been sighted within the clearing area, habitat in this reach is similar to areas where clapper rail sightings have been made.

Prime Farmlands

Neither Allenville nor the relocation site contain areas designated as prime or additional irrigated farmland. Although both sites are adjacent to an area designated as additional irrigated farmland, and are near prime farmland areas, no impacts are anticipated.

Cultural Resources

No impacts to cultural resources are anticipated as a result of construction at the relocation site. No surface resources were identified at or near the site, and no subsurface resources are expected.

Cultural resources are considered likely to exist at the old site, although no surface remains were identified. If the existing ground surface is disturbed, it is likely that subsurface resources would be affected. If the existing surface is to be disturbed extensively, a test excavation program would have to be conducted to determine the existence and significance of buried sites. If subsurface sites are encountered during construction, an archaeologist will be present to evaluate the resources.

If channel clearing activities are confined to the channel centerline, no impacts are anticipated on cultural resources.

Health and Safety

Currently, the land adjacent to the eastern border of the relocation site is under cultivation and is periodically sprayed with pesticides. Three of the pesticides in use on the land are listed as restricted by EPA, and require application by a certified applicator. Two of the five pesticides have an unpleasant odor. Wind direction information for the relocation site shows that the prevailing winds are from the east, across the site. The easterly winds are normally of low velocity, limiting dispersion of the pesticides. Under normal conditions, winds shift during the course of the day and westerly winds predominate for a portion of the midafternoon.

Some adverse impact from odor is expected as a result of the proximity of the relocation site to agricultural lands that are sprayed especially as a result of the odor. An EPA advisory opinion, published in the Federal Register on October 17, 1979 (which is no longer in effect), suggested several mitigative measures to follow when spraying in the vicinity of a residential area, including a quarter-mile buffer zone. Monitoring the results of these measures suggest that the quarter-mile buffer may not be effective in eliminating odors. Use of the other recommendations would be the prerogative of the applicator.

The individuals involved in the Allenville relocation are presently exposed to pesticide spraying. They have been apprised of the pesticide situation at the relocation site, however, and do not consider it serious. Should the situation become unacceptable, the residents will have recourse under existing safety rules and other regulations that have been established to protect inhabited areas. These rules and regulations allow the State Board of Pesticide Control to limit the use of any pesticide within a designated area, to regulate the application of pesticides in and around residential areas, and to issue a cease and desist order for application of pesticides in and around residential areas. A rule, regulation, or order may be adopted by the Board only after a public hearing. The Board may issue an order to regulate or limit the use of any pesticide, including restricting use completely within a designated area, after receiving written notice from the Director of the Department of Health Services of an imminent hazard of acute dermal or inhalation toxicity of the pesticide to the public health. (State of Arizona, 1977; 1979).

The relocation site is located directly northeast of a small municipal airport. The southwest - northeast runway flight pattern crosses the southeast corner of the development. This is a limited use runway. This is not anticipated to be a serious safety consideration. Present plans for expansion indicate that the SW-NE runway will be abandoned.

Community Cohesion

The relocation alternatives require the displacement of the population of Allenville. Any move of this nature involves some inconveniences and hardships. This is particularly the case with the elderly of Allenville's population. Since Allenville is a close-knit community, any hardships felt

Cultural Opportunities

A negative cultural impact identified under the relocation alternatives could result from the loss of two churches in existing Allenville. There are, however, 15 churches of all faiths located in nearby Buckeye. The State is looking at the possibility of assisting in the relocation of the churches. The other alternatives are not expected to produce significant negative impacts on cultural opportunities.

Desirable Community Growth

The effects of the relocation alternative are primarily positive in regard to desirable community growth. It could occur under the community relocation alternative because of the greatly reduced risk of flood loss. Because of limits imposed by flood proofing and the Maricopa County Floodplain Ordinance, community growth under channel clearing and the no project alternatives would not be possible. Some growth would be possible with the levee alternative. The individual relocation alternative would destroy the present community of Allenville and, therefore, would impact negatively upon community growth.

Local Government Finance

In the relocation alternatives property values and tax revenues will increase. This will be the result of higher value housing units and the reduced flood risk. Estimated tax revenues will increase sixfold over those generated at the old site. Although a notable positive effect would occur to the tax base under this alternative, a similar negative effect would be shifted to the relocated taxpayers. The consequence of paying a higher tax bill may place a burden on many of the Allenville relocatees. The tax base of the Palo Verde School District will increase from $4,500,000 to approximately $7,000,000 as a result of the community relocation. If property tax expenditures per student remain constant tax rates will decrease $1.00 from the current rate of $3.45/$100 assessed valuation.

There are no anticipated negative impacts expected to occur to local government finance under the levee alternative.

In the no action alternative local government finance would be impacted to the extent that it provided funds to help the community rebuild. In the long term, future flooding would undoubtedly cause similar negative impacts.

In the flood proofing alternative there probably would be increases in the tax base and property values, as in the relocation alternative. Local property taxes would increase and these could place hardships on many residents.

Both relocation alternatives, flood proofing, and the levee alternative would have a positive impact on County and State finances, in that emergency assistance would no longer be required for the community of Allenville.

by the elderly would be minimized with the community relocation plan. The disruption of the community also would be less than that caused by flooding. There is, however, the possibility that the two churches and the lodge will not be rebuilt at the new community, although locations for these facilities are provided in the site plan. The loss of these facilities could be an inconvenience for the relocatees.

Individual relocation cannot be accomplished while retaining any semblance of a community. There are very few homes available in the vicinity of Buckeye. As a consequence, most of the families would have to relocate in Phoenix. Once in Phoenix, the residents would be scattered, thereby destroying the community. The community center, two churches, and lodge also would cease to exist.

With the flood proofing alternative, the community would remain much as it has been in the past, with the exception that all structures would be free from floods to the 100-year level. The community center, churches, and lodge would eventually be restored.

Channel clearing would do little to reduce Allenville's susceptibility to flooding, and damages would continue to occur. The cohesion of the community also would continue to be disrupted by flooding.

With a levee to protect Allenville from the Standard Project Flood, the community would remain intact at the present location, and would no longer be susceptible to flooding. The two churches, lodge, and community center would be restored.

Housing

The relocation of Allenville out of the Gila River floodplain will have positive impacts on housing. Although the community relocation alternative would destroy 54 structures at the present Allenville site, 40 replacement homes will be provided nearby. The new community site would be located out of the flood hazard zone, and built to safe and sanitary standards mandated by the Department of Housing and Urban Development. The construction of such homes would provide greatly upgraded housing. The benefits associated with the new housing could mitigate the negative impacts experienced by the community in moving.

Under the community relocation alternative, renters in Allenville will be provided upgraded rental housing. It is planned to allow renters to buy the mobile homes in which they were living and move them to prepared pads at the new site. This would result in an improvement of the quality of housing over pre-flood conditions for some renters, and would serve to keep the community together. The no action and channel clearing alternatives are expected to have negative impacts on housing as the result of continued flooding at Allenville. Residents of the community also would remain in substandard housing. Under the individual relocation plan, the 51 families would be relocated into existing standard homes, which would reduce the total housing supply in Maricopa County. With the flood proofing and levee alternatives there would be no impacts on housing. The residents would remain in substandard housing under both plans.

Land Use

In the relocation alternatives land uses will be very similar, with the exception that the old Allenville site would be converted to wildlife habitat. The new site will be converted from vacant to urban uses under the community relocation plan. These uses are not anticipated to have significant negative impacts. The community relocation alternative may cause a minor impact on adjacent agricultural land uses if the spraying of pesticides becomes a serious problem. If required by future legislation, a buffer zone of 1/4 mile would result in the loss of approximately 100 of 480 acres of State-leased land presently in production adjacent to the relocation site. The proximity of the Buckeye Municipal Airport to the relocation site is not considered to be a significant land use conflict. The other alternatives considered are not expected to cause any negative land use impacts.

Public Facilities

No negative impacts are expected to occur in public facilities under the relocation, flood proofing, or levee alternatives. Under the no action alternative, public and quasi-public facilities would continue to suffer damages from flooding.

Ten elementary school students will be transferred from Buckeye Elementary School to Palo Verde Elementary School. One-hundred forty students are presently enrolled in Palo Verde Elementary School. The addition of up to three students per classroom should not have a negative effect on the school.

Public Services

There is expected to be a positive impact on the quality of water provided Allenville residents under the relocation alternatives. No negative impacts are expected under any of the alternatives. Emergency services associated with flooding would no longer be required with the relocation alternatives, the flood proofing alternative, or the levee alternative. The community relocation alternative would have a positive effect on fire protection for the community. Although the nearest fire station is located in Buckeye, fire protection will be improved due to the inclusion of fire hydrants at the relocation sites. Formerly Allenville had no fire protection system. Other public services such as rescue, ambulance, County Sheriff and the multiple services provided by the Maricopa County Human Resources Department, Office on Aging, including a hot lunch program for the elderly, will not be significantly affected and will remain available to Allenville residents.

Local/Regional Activity

There are no significant impacts under any of the alternatives in this area.

Real Income Distribution

Real income of Allenville residents may be reduced slightly under all alternatives. As a result of the relocation alternatives, homeowners and renters will receive relocation benefits. These benefits will be spent on purchases of new homes. For community relocation, no significant extra financial burdens will occur in the form of additional mortgages. The tax rates at the new site, however, will increase over the rates at the old location. Under the levee and flood proofing alternatives, property values will increase as a result of flood protection, and taxes and rents will increase accordingly. In all cases, except channel clearing, however, monetary losses due to flooding will be eliminated.

Employment/Labor Force

No significant impacts are expected in this area under any of the alternatives, except the individual relocation plan. Since there is insufficient housing available in the Buckeye area, some of those residents currently employed in Buckeye or at the Palo Verde Nuclear Generating Station may be forced to seek employment elsewhere or incur increased transportation costs and time. This may negatively impact the labor supply, both in the Buckeye area and in the locations to which the residents might move.

There are not expected to be significant negative impacts on business and industrial activity under the other alternatives considered.

Agricultural Activity

No significant impacts are expected under any of the alternatives. A minor impact on agricultural lands adjacent to the site may result if pesticide spraying becomes a serious problem.

Transportation

Allenville is currently located approximately two miles from downtown Buckeye. Almost all travel from Allenville for shopping, recreation, and services in Buckeye has traditionally been by automobile. The distance to Buckeye would increase under the community relocation plan by eight miles. This additional distance will not be viewed by Allenville residents as a significant problem. Transportation to the County hot lunch program can be provided residents at the relocation site.

Bus service to Palo Verde Elementary School currently passes the relocation site.

PUBLIC INVOLVEMENT

To meet the objectives of the Allenville public involvement program, activities were conducted appropriate to plan development. Rather than being a fixed program, public involvement was flexible and was monitored for effectiveness as the study progressed. The public involvement program as a vehicle for discussion of community desires and purposes provided the opportunity to obtain information concerning the acceptability of alternative plans.

Public Involvement Program

In January 1979, coordination on Allenville between the State of Arizona and the Federal Disaster Assistance Administration (FDAA) began with meetings of State officials, the FDAA, and a representative of the Allenville community. The public involvement program began with the preparation in July 1979 of the Reconnaissance Report, Small Flood Control Project Authority, Gila River Basin, Allenville, Arizona by the Los Angeles District of the Corps of Engineers. This document contained background data and presented initial alternatives for the alleviation of Allenville's flooding problems. Following the publication of the Reconnaissance Report, a survey conducted by the State indicated that almost all of the residents of Allenville favored the relocation alternative. On September 19, 1979, a meeting of Allenville residents was held in Buckeye, Arizona with representatives of the Corps and State to discuss the alternatives. A leaflet summarizing the study and alternatives was then prepared by the Corps and distributed to the residents and other concerned citizens, agencies, and organizations. This was followed by a formal public meeting on September 28, 1979 at the Buckeye Union High School Auditorium at which results of the study to date were presented, questions answered, and comments noted. One public workshop was conducted on October 23, 1979 in Allenville by the State's architect-engineer and attended by members of the Corps and State study teams. The purpose of this meeting was to present descriptions of the relocation sites in detail and to solicit the ideas and preferences of the evacuees regarding the new location and housing designs. Following this, two petitions were circulated among Allenville residents. These stated that the residents favored relocation as a community, and acknowledged the Board of Directors of the Allenville Community for Progress, Inc. as their spokesman on matters pertaining to the community. A second public workshop was held in Allenville on January 24, 1980 to bring the residents up to date on the planning process, and to discuss with them the preliminary designs and costs of homes at the new site. The final public meeting was held on the evening of April 2, 1980 at the Buckeye Elementary School Cafetorium. Findings of the Detailed Project Report were summarized. A question and answer period followed, during which concerns of residents of the Buckeye area regarding the community relocation alternative were discussed.

Required Coordination

The Corps has coordinated the environmental work that has been performed at Allenville with the U.S. Fish and Wildlife Service, the Arizona Department of Game and Fish, the State Historic Preservation Officer, the Soil Conservation Service and several other Federal and State agencies.

Statement Recipients

1. Department of Housing and Urban Development
2. Farmers Home Administration
3. Environmental Protection Agency
4. Economic Development Administration
5. U.S. Fish and Wildlife Service
6. Arizona Congressional Delegation
7. Arizona Department of Health Services (Bureau of Water Quality Control)
8. Arizona Department of Game and Fish
9. Arizona State Land Department
10. Arizona State Division of Emergency Services
11. Arizona Water Commission
12. Arizona State Clearinghouse
13. Maricopa County Health Department
14. Maricopa County Highway Department
15. Maricopa County Planning Department
16. Flood Control District of Maricopa County
17. Maricopa Association of Governments (Planning and Transportation Office)
18. Maricopa County Supervisor Ed Pastor
19. Citizens Concerned About the Project
20. Maricopa Audubon Society
21. City of Buckeye

Public Views and Responses

From the beginning of the Allenville Flood Damage Reduction Study, the Corps actively solicited views from the general public, interest groups, and the citizens of Allenville. An initial formal public meetings, held on September 28, 1979 in Buckeye, was attended by both Allenville residents and other interested citizens. The following issues were raised:

1. Concerns regarding the equitable nature of the proposed land exchange;

2. Nonresident landowners' concerns over the land exchange and future use of the present site of Allenville in the relocation alternative;

3. Concerns over the nearness to the Palo Verde Nuclear Generating Station;

4. Concerns regarding the quality of water at the proposed relocation site.

The meeting was transcribed and copies of the transcript are available at the Corps of Engineers office, Suite 800, 2721 N. Central Avenue, Phoenix, Arizona.

Throughout the course of the study the Corps and State discussed their progress with Allenville residents. A petition, dated October 1979, was signed by 67 percent of the residents of Allenville stating that they favor relocation as a community. This indication of support played a key role in the selection of community relocation as the preferred plan. Forty families in Allenville, all the homeowners and renters who intend to relocate to the new site, have signed letters of intent with the State to that effect.

Concerns of both the Allenville residents and other interested members of the public were heard again at the public meeting held in Buckeye on April 2, 1980. The meeting was transcribed and copies are available from the Corps of Engineers office, Suite 800, 2721 N. Central Avenue, Phoenix, Arizona. The following issues were raised:

1. Possible harmful effects on the population from pesticide spraying adjacent to the relocation site;

2. Possible loss of cropland because of pesticide spraying restrictions;

3. Impacts resulting from the introduction of residential and commercial land uses into a rural area;

4. Concerns regarding the quality of water at the relocation site;

5. Impacts of large numbers of children from the new community on the Palo Verde Elementary School District;

6. Increased distance of the relocation site from services and facilities in Buckeye;

7. Opposition by upstream and downstream residents to transfer of the present Allenville site to the Arizona Department of Game and Fish once the structures are razed.

These concerns have largely been addressed in revised portions of the Main Report and Environmental Assessment of this Detailed Project Report. It also should be noted that the issues raised at the April public meeting came from farmers and non-Allenville residents from the surrounding area. Persons from Allenville attending the meeting spoke out strongly in favor of the community relocation alternative.

Prior to the meeting on April 2nd, the report was distributed for public review. Letters of comment received on this report have been reprinted in their entirety in Appendix A. Responses to the comments follow each letter. The following issues were raised in the letters:

1. Potential noise, safety and conflicting land use problems due to the relocation site's close proximity to the Buckeye Municipal Airport;

2. Transportation-related problems due to Allenville's increased distance from shopping and services in Buckeye;

3. Availability of emergency and public services for Allenville residents at the relocation site;

4. Availability of school bus service for Allenville children attending public schools;

5. Inclusion of views and comments expressed by concerned citizens into the final report;

6. Revision of deficient sections of the Detailed Project Report;

7. Possible adverse effects on the community of Palo Verde as a result of Allenville's relocation;

8. Concerns that channelization of sections of the Gila River would be precluded as a result of Allenville's relocation;

9. Lack of aid to other flood victims in the area;

10. The question of whether or not some Allenville residents would be "forced" to move to the relocation site.

The report has been revised where necessary to address these issues.

FINDINGS

Significant factors considered during the environmental study included the effects of the project on vegetation, wildlife, and cultural resources. Also considered were the social and physical effects on residents as a result of relocation. Through environmental studies and public participation, it was determined that the proposed action will not significantly affect the quality of the human environment, and there will be no significant environmental effects. An Environmental Impact Statement will not be required for this action.

GWYNN A. TEAGUE
COL, CE
District Engineer

LIST OF PREPARERS

The following people were responsible for preparing this assessment:

NAME	EXPERTISE	EXPERIENCE	DISCIPLINE
Neil Erwin (project mgr.)	Civil Engr.	8 years civil engr., Corps 6 months planner, L.A. District	Engineer
Carol Grooms	Envir. Planner	6 years EIS studies, L. A. District	Engineer
John Gutwein	Economist	1 year Community Planner, City of L. A. 1 year Economic Studies, L. A. District	Urban Planner
Joe Mantey	Economist	2 years Economic Studies, L. A. District	Economics
Ken Kules	Envir. Planner	6 years Envir. Studies, L.A. District	Engineer
Pat Martz	Archaeologist	2 years Archaeological Studies, L.A. Dist. 2 years field archaeological work, consultant	Archaeology
Frank MacDonald	Economist	6 years Economic Studies, L.A. District	Economics

Work was performed by Dames & Moore under contract to the Corps of Engineers. The following individuals participated in the work:

Natalie Waugh
Richard Maze
Lyle Stone (Archaeological Research Service)
Glenn Cass
James Geiser
Kenneth Evans
Barbara Murphy

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In addition, the following agencies and individuals were contacts:

Federal

Environmental Protection Agency
Barbara Nellor, Environmental Protection Specialist

State

Arizona Department of Health Services
Dr. Whitcomb, Environmental Health Services

Arizona Department of Transportation
James Roose
Mark Myers, Aeronautics Division

Arizona Game and Fish Department
Richard Todd, Non-game Specialist

Arizona State Land Department
Records Office

State of Arizona Board of Pesticide Control
James Pizarro, Inspector
Richard Sweet, Administrative Assistant

County

Maricopa County Department of Health Services
Jerry O'Connell

Local

Town of Buckeye
Steve Thompson, Mayor

Private

Gladden Farms, Inc.
Mrs. W. T. Gladden
Mr. W. T. Gladden