Ventana de Flores

Specific Plan

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The City of Sierra Vista's General Development Plan
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Ventana de Flores Specific Plan

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SECTION 1 – INTRODUCTION

1 A. Executive Summary

The Ventana de Flores Specific Plan is a 335.3 acre development within the southeastern portion of the City of Sierra Vista, Arizona which integrates residential development, open space preservation, and recreational amenities. The Ventana de Flores Specific Plan complements and follows the intent of VISTA 2020 General Plan, while taking specific site conditions and surrounding land uses into account.

The Specific Plan, as defined in the City of Sierra Vista Development Code, provides the opportunity of amending zoning ordinances in order to create more appropriate land use and density designations. The Specific Plan allows the creation of a comprehensive area plan, zoning ordinance, traffic plan, infrastructure plan, and parks and recreation plan on a scope small enough that it remains responsive to the individual site characteristics.

1 B. Project Location

The Ventana de Flores Specific Plan area is 335.3 acres located in the southeast portion of the City of Sierra Vista, Arizona, within Sections 19, 20, 29 and 30 Township 22 South, Range 21 East of the Gila and Salt River Base Meridian, in Cochise County, Arizona. The project site is approximately one half mile east of the intersection of State Route 92 and Glenn Road; bordered by the Golden Acres mobile home park to the north; San Pedro Avenue, an unpaved roadway, to the west; Wakefield Drive to the south; and the Avenida del Sol alignment to the east. The western and southern boundaries of the project area are bordered by low-density residential uses, while the eastern boundary is bordered by Arizona State Trust Land (refer to Figure 1 and Figure 2).

1 C. Project Description

The Ventana de Flores Specific Plan integrates residential, public recreational facilities, and open space uses. The development will provide attractive housing options for multiple lifestyles within several price ranges which will complement and enhance existing residential development within the area. The Ventana de Flores Specific Plan consists of a total of 1,480 proposed residential units within twelve neighborhoods of varying densities connected through a multi-modal path system. Residential densities within the development have been planned to create a harmonious transition from existing residential development in the area.

Multi-modal paths will connect the neighborhoods within the Ventana de Flores Specific Plan and will also provide connections from the neighborhoods to the existing and future Sierra Vista Trails System via connections along Canyon de Flores Drive and Glenn Road. The proposed multi-modal paths total approximately 3.10 miles in length. In addition, the paths will allow residents and the Sierra Vista community to access to the approximately 20 acre public area park and approximately 5 acre public neighborhood park proposed within the Specific Plan. During the platting phase, it will be determined if multi-modal path, approximately .74 mile length, can be installed within the open space adjacent to the Golden Acres mobile home park without negatively impacting the surface water flow patterns or the capacity of the riparian corridor. This potential multi-modal path would be connected with the multi-modal path at the collector roadways. Open

space within and along flood prone areas will be dedicated to the public and be preserved on both the north and southeast borders in a contiguous manner to discourage the fragmentation of wildlife corridors.

The project area will be served by two main access connections to State Route 92, from the northwest portion of the project via Canyon de Flores Drive and from the western portion of the project via Glenn Road. Both Canyon de Flores Drive and Glenn Road are listed within Cochise County's Sierra Vista Area Traffic Circulation Plan as residential collectors. Cochise County is re-designating Glenn Road from arterial to collector street status. Glenn Road will connect on the eastern side of the project to the future Avenida del Sol alignment at the Valley Road alignment. The internal roadway system is planned with the intention of effectively distributing traffic throughout the site and mitigating any possible impacts on existing residential development within the surrounding area. The roadway system will built in conjunction with multi-modal paths to promote a pedestrian and bicycle friendly environment.

The Ventana de Flores Specific Plan also provides the framework for a strong sense of place and unifying theme through the use of entry and internal monuments, signage, landscaping, and lighting. Entry and internal monuments will be used to define the individual neighborhoods and two public parks. Signage will similarly define individual neighborhoods and connect each to the broader Ventana de Flores Specific Plan area through the use of the City of Sierra Vista's Comprehensive Sign Plan.

The Ventana de Flores Specific Plan requires and encourages the conservation of water through a number of ways and closely follows the Upper San Pedro Partnership's Water Conservation Model Ordinance (refer to Table 5). The Specific Plan commits to the use of native and drought tolerant vegetation for both the streetscape and front yards of all lots from the City of Sierra Vista Plant List (refer to Appendix A) to promote the water-conserving xeriscape concept as well as blending the residential development landscaping with the preserved open spaces. Turf will not be allowed in either front yards or side yards, and will be limited to 400 square feet in rear yards. Homes will be built with a number of water conserving features either as standard installations or available as upgrade options; such as water efficient appliances, hot water recirculation pumps, gray water valves, aerated faucets, and low-flow toilets and showerheads. Evaporative coolers will not be allowed, and homes built with pools will be required to have pool covers installed to mitigate evaporation. Additionally, the public parks will be built with water harvesting techniques in mind, and water features will not be allowed.

The Specific Plan also encourages the conservation of power. Homes will be built within conformance of the Sulphur Springs Valley Electric Cooperative's Touchstone Energy® Home Program. Energy efficient appliances will be utilized in new residences, either as standard installations or available as upgrade options for homebuyers. All lighting will also be directed downward and fully shielded to avoid light and glare impacts and to minimize light pollution.

1 D. Authority & Scope

The Ventana de Flores Specific Plan was prepared pursuant to the provisions of the Arizona Revised Statues, Title 9, Chapter 4, Article 6, Section 9-461.09 through 9-461.10. The Arizona Revised Statutes authorizes jurisdictions to adopt Specific Plans by ordinance or resolution. The City of Sierra Vista Development Code authorizes the preparation and adoption of Specific Plans within Article 151.27. Hearings will be held by both the Planning and Zoning Commission and the Mayor and City Council before the Specific Plan is adopted.

The Ventana de Flores Specific Plan is a regulatory plan which will serve as zoning for the project area. Proposed development plans, or agreements, preliminary plats, site plans, and any other development approval must be consistent with this Specific Plan. Any regulations not specifically addressed in this plan shall meet City of Sierra Vista Development Code standards.

The intent of the Specific Plan is to provide a concise development plan for the proposed site. This Specific Plan will serve to implement the development of VISTA 2020 General Plan within the bounds of the regulations provided herein and will be adopted by ordinance as a regulatory document.

1 E. Legal Description

Legal descriptions of the parcels totaling 335.273 acres are provided in Appendix B. A copy of an ALTA Survey is included in Figure 17.

1 F. Ownership & Tax Code

The Ventana de Flores Specific Plan area is owned by:

TSP (Tucson/Sierra Properties)
2730 E Broadway Blvd, Suite #135
Tucson, Arizona 85716
(520) 325-7500

Cochise County Assessor Tax Parcel Numbers are as follows:

107-37-069A-9
107-56-005B-7
107-47-009J-2

SECTION 2 – STATEMENT OF INTENT

Specific Plans offer an alternative planning method to the conventional fixed zoning districts. Other planning tools, such as rezoning and planned area developments, are not as flexible as the specific plan, and often lead to the creation of piecemeal residential developments not connected to the surrounding community or integrated with the community's broader needs. The use of specific plans allows the cohesive creation of developments in which homebuilders can respond to both wider public needs and specific site opportunities.

The Ventana de Flores Specific Plan consists of a planned residential community that includes a variety of single family residential lots including both detached homes and attached homes within twelve neighborhoods. Lot sizes vary from 3,500 square feet to 8,000 square feet. The Ventana de Flores Specific Plan contains an open space feature, which will act as both a buffer to existing residential uses and act as a wildlife corridor. The Specific Plan area will also contain a public area park and a public neighborhood park, of approximately 20 acres and 5 acres in size, respectively. A multi-modal path will run along both collector streets within the community and connect the neighborhoods to the parks and to the existing and future Sierra Vista Trails System.

The Ventana de Flores Specific Plan provides:

- Preservation of natural open space, wildlife corridors
- An approximately 20 acre public area park – providing approximately 10 acres of active and 10 acres of passive recreational use
- An approximately 5 acre public neighborhood park
- Dedication of approximately 14 acres of open space to provide for continuity of drainage and wildlife corridors
- An opportunity to create a consistent, attractive signage and neighborhood theme system throughout the community
- A series of multi-modal paths, at least 3.10 miles in length, to encourage alternative modes of transportation, recreation opportunities, and connect the neighborhoods to the proposed public parks and to the existing and future Sierra Vista Trails System
- Water conservation through the use of native or drought resistant, low-maintenance plant species in public roadways and individual front yard lot landscaping, water efficient and conserving features installed or offered in homes, and water harvesting techniques utilized in the public parks
- Multiple residential housing types to accommodate multiple lifestyles and varying levels of affordability
- Conformance with Sulphur Springs Valley Electric Cooperative's Touchstone Energy® Home Program

SECTION 3 – SITE & AREA ANALYSIS

3 A. Surface Hydrology and Water Resources

There are two minor offsite watersheds which impact the Ventana de Flores Specific Plan area. The primary wash flows along the northwest property line, adjacent to the Golden Acres mobile home park and continues to the east, and runs generally south of the active recreation use area of the proposed area park site. This wash has an ill-defined channel with limits that are difficult to ascertain on the ground. A second wash with a less defined channel is located within the southeast corner of the Specific Plan area. The off-site runoff combines with on-site runoff and flows northeasterly across the parcel within existing watercourses. Three watercourses (Wash 10, Wash 30, and Wash 40) located within the area have 100-year peak discharges of 100 c.f.s., or greater. 100-year floodplains have been delineated and are shown on Figure 3. Only Wash 40 has been previously mapped as a regulatory 100-year floodplain in conjunction with the Flood Insurance Study (FIS) for Cochise County. A copy of this portion of the FEMA map is included in Figure 5. Refer to Appendix C for the complete Hydrologic and Hydraulic Report.

A 404 analysis of the property has been completed and Figure 4 shows the washes that have been determined to be waters that fall under the jurisdiction of the U.S. Army Corp of Engineers. This project will be constructed under the nationwide permit. Therefore the majority of the wash crossings will be constructed with arch culverts to span the wash bottoms and disturbances to these washes will be limited to the amount allowed under the permit. Refer to Appendix D for the complete Jurisdictional Delineation Report.

3 B. Topography and Slope

The project site generally slopes from the southwest to northeast. A general slope analysis shows that the average slope of the site is approximately 1.8%. There are no significant topographic features located within the site. The project has been mapped with one foot contour intervals for use in floodplain determination and site grading. Topographic mapping is included in the ALTA survey in Figure 17.

3 C. Land Use Information

The area included in the Ventana de Flores Specific Plan was originally zoned MH-72 under the Cochise County Code. The MH-72 zoning designation allows the development of one unit per 7,200 square foot lot. MH-72 allows the development of single and multiple-household dwellings, including manufactured homes, mobile homes, and recreational vehicle parks. The Specific Plan area has since been annexed into the City of Sierra Vista. The closest corresponding City of Sierra Vista zoning designation is SFR8. The SFR8 zoning designation allows one single-family residence per 8,000 square foot lot.

To the north and adjacent to the Specific Plan area is the Golden Acres mobile home park with approximately 280 units, zoned MH-72 under the Cochise County Code. Residential development to the west and south of the Specific Plan area is a combination of mobile homes, manufactured homes and conventional housing. The zoning to the west and south is a mix between MH-72 and TR-36 zoning under the Cochise County Code. TR-36 zoning allows single family dwellings, multiple household

dwellings, mobile homes, manufactured homes, and recreational vehicle parks at the maximum development of one unit per 36,000 square foot lot. Bordering the area on the east is undeveloped Arizona State Trust land, currently zoned RU-4 under the Cochise County Code. RU-4 zoning allows single family dwellings, multiple household dwellings, mobile homes, manufactured homes, and recreational vehicle parks at the maximum development of 1 unit per every 4 acres. Existing zoning designations in the area are depicted in Figure 6.

3 D. Soils and Geology

Preliminary research and information collected from the U.S. Department of Agriculture, National Resources Conservation Service, indicates the Specific Plan area consists entirely of the Graveyard-Sierravista Complex (76) soils type. This soils type is favorable for residential unit development utilizing standard engineering and construction practices. A formal soil analyses will be completed to determine pavement and foundation design requirements prior to any construction activity within the Ventana de Flores Specific Plan area.

3 E. Vegetation and Sensitive Species

The Ventana de Flores Specific Plan is located within the Semidesert Grassland biotic community. It is characterized by scrub vegetation with an understory of perennial grasses. Through field observations, the following trees and shrubs were found on the site:

Mesquite	*Prosopis velutina*
Whitethorn Acacia	*Acacia greggii*
Catclaw Acacia	*Acacia constricta*
Creosote Bush	*Larrea tridentata*
Soaptree Yucca	*Yucca elata*
Prickly Pear	*Opuntia spp.*

Within this biotic community, the presence of the following perennial grasses could reasonably be expected:

Poverty three-awn	*Aristida divaricata*
Red three-awn	*Aristida longiseta*
Purple three-awn	*Aristida purpurea*
Cane beardgrass	*Bothriochloa barbinodis*
Sideoats grama	*Bouteloua curtipendula*
Black grama	*Bouteloua eriopoda*
Lehmann lovegrass	*Eragrostis lehmanniana*
Green sprangletop	*Leptochloa dubia*
Vine mesquite grass	*Panicum spp.*
Little Bluestem	*Schizachyrium scoparium*
Bristlegrasses	*Setaria spp.*
Wright Sacaton	*Sporobolus wrightii*
Fluffgrass	*Tridens pulchellus*

Tree and shrub species found within the site are only in fair to poor condition. Much of the mesquite (*Prosopis velutina)* shows evidence of periodic damaging frosts as well as the effects of grazing in the past. This evidence is manifested by the presence of large,

old, often-rotted trunks with a small live tree growing out of this trunk. There is also significant dead growth on these trees indicating temperature and drought stress. Whitethorn acacia (*Acacia greggii)* is also showing signs of drought and temperature stress. At the time of field visits, the acacia was mostly void of leaves. Random sampling indicated that 15-20% of the biomass of acacia was dead or seriously stressed.

Vegetation within the wash zones do not vary by species from the general vegetation found on the site. There is, however, an increase in vegetative density from the surrounding areas when viewed from aerial photos.

There is also one area of significant disturbance. This is the presence of wastewater treatment ponds along the northern edge of the site, near the eastern boundary. This area has been cleared of native vegetation. The presence of invader species such as Desert Broom (*Baccharis sarothroides)* and Bermuda grass (*Cynodon spp.)* could reasonably be expected in this area.

Vegetative densities were measured from aerial photos and confirmed through field observations. The site generally has low vegetative cover with the wash area have medium vegetative cover. No areas of high vegetative cover were identified on the site. Vegetative cover does not take into account grasses or other low level vegetation since this vegetation will vary with the season and weather. A copy of the full Vegetation and Sensitive Species Report is included in Appendix E.

3 F. Existing Structures, Roads, and Other Development

The majority of the Ventana de Flores Specific Plan area is currently undeveloped land. Two sewage treatment ponds are currently located within the northeast corner of the area, connected to disposal fields on the eastern portion of the site. The use of the treatment ponds and disposal fields will be discontinued and the facilities will be dismantled once the current sewage disposal system is replaced by a sewer line planned to serve the property from the north. The closing of the plant will be done in accordance with all Arizona State and Federal requirements.

There is also a functioning well and booster station located within the center of the Specific Plan area (within Block G) owned and operated by Southland Utility Company. The well and booster station will be expanded at this location to serve the Ventana de Flores Specific Plan development.

Canyon de Flores Drive has previously been paved through the Golden Acres mobile home park. Glenn Road and San Pedro Avenue exist as unpaved roadways at the west property line and Wakefield Drive is a paved roadway at the south boundary line. Various unimproved dirt paths run through the project area.

3 G. Existing Infrastructure and Public Services

The Specific Plan area is bordered on three sides by existing residential development and will both utilize existing connections to utilities and services as well as extending utility lines when needed.

Table 1: Utility/Service Providers

Utility / Service	Provider
Electricity	Sulphur Springs Valley Electric Company
Water	Southland Utility Company
Natural Gas	Southwest Gas
Sewer	City of Sierra Vista
Telephone	Qwest Communications
Cable Television	Cox Communications

Sewer

The entire development will be connected into the City of Sierra Vista sewer collection system. However, due to topographic constraints, the eastern portion of the site, Blocks D, M, N, and O, will require a temporary lift station. This lift station will be constructed by the developer and owned, operated, and maintained by a homeowner's association. When gravity flow is available to the area, the lift station will be taken out of operation.

Educational Facilities

The Specific Plan area is within and will be served by the Sierra Vista Public Schools District. This school district currently operates six elementary schools, two middle schools, and one high school, serving approximately 6,830 children. At this time, the northern half of the Specific Plan area is currently designated as being served by Village Meadows Elementary School and Apache Middle School, while the southern half is designated as being served by Huachuca Mountain Elementary School and Sierra Vista Middle School. At this time, the entire Specific Plan site is designated as being served by the Buena High School. This may change as the Tribute Specific Plan to the north is providing the Sierra Vista Public Schools District with the option to purchase property to construct new facilities. The Sierra Vista Public Schools District also owns the adjacent property north of the proposed approximately 20 acre public area park site (Block C).

The Specific Plan area is also served by the Cochise College and the University of Arizona South. Cochise College offers two-year degree programs and has approximately 2,495 students in their Sierra Vista campus. The University of Arizona South Sierra Vista Campus serves approximately 776 students and offers students four-year degree programs.

Recreational Facilities

A multi-modal path along the west side of State Route 92, terminating approximately 1.5 miles from the Specific Plan area, provides opportunities for walking, jogging, bicycling, and skating. The closest public park, the Purple Heart Park north of Foothills Drive and west of Avenida del Sol, is approximately five miles from this site. The Tribute Specific Plan to the north proposes an area of natural open space south of Buffalo Soldier Trail as well as and two regional detention basin / recreational facilities. The Bureau of Land Management property adjacent to the north is also planned as a possible future recreation area. The Coronado National Forest also provides recreational opportunities for activities such as camping, hiking, picnicking, and bird-watching and is located within a half hour drive from this site.

3 H. Traffic

The current roadway network surrounding the Specific Plan area consists of State Route 92, Buffalo Soldier Trail, Canyon de Flores Drive, Golden Acres Drive, and Glenn Road. In the Traffic Circulation Plan within Sierra Vista's VISTA 2020 General Plan, State Route 92 is classified as a principal arterial; Buffalo Soldier Trail is classified as a minor arterial; and Glenn Road is classified as a collector. Canyon de Flores Drive is not currently classified but should be classified as a collector. Under Cochise County's Sierra Vista Area Traffic Circulation Plan, Golden Acres Drive is listed as a collector street and Glenn Road is being reclassified from arterial street status to a collector street.

The future extension of both Canyon de Flores Drive and Glenn Road will serve as the primary access routes to State Route 92 as part of the Specific Plan development. Refer to Appendix F for the complete Traffic Report.

3 I. Synthesis and Summary of Analysis

The Ventana de Flores Specific Plan area is appropriate for development with preservation and/or mitigation plans for hydrology, cultural, and biological resources. The Specific Plan area is surrounded on three sides by existing residential land uses and is in proximity to existing infrastructure and public services. The area is identified in Attachment 5-3 of the City of Sierra Vista's VISTA 2020 General Plan as being in close proximity to a future residential growth area.

Further, the plan conforms to the Goals and Elements of the City of Sierra Vista's VISTA 2020 General Plan as follows:

1. **Citizen Participation Element**
   The Ventana de Flores Specific Plan has conformed to the VISTA 2020 General Plan by providing a neighborhood meeting prior to the initial submittal to solicit input on issues that would impact people living or owning land within 500 feet as specified under the City of Sierra Vista's Development Code. Notification of the meeting was also sent to residents and owners within 1,000 feet as specified by Cochise County's Code. Over 50 people were in attendance and their comments have been incorporated into this Specific Plan document. Public input will continue to be accepted and integrated throughout the planning process.

2. **Land Use Element**
   Although Attachment 2-7 of the VISTA 2020 General Plan indicates that this area will have Low Density Residential, the Ventana de Flores Specific Plan conforms to the growth and land uses that either currently exist or are planned in the nearby area. There will be a mix of lot sizes and products all of which are supported within the City of Sierra Vista Development Code. In addition floodplains will be left natural and offsite roadways will be constructed to City of Sierra Vista standards at no cost to the City of Sierra Vista.

3. **Transportation and Circulation Element**
   The Ventana de Flores Specific Plan conforms to the VISTA 2020 General Plan by incorporating safe, convenient, and energy efficient transportation system, including streets, bicycle routes, sidewalks, and multi-modal paths.

These systems will be tied to similar facilities along State Route 92. This project will construct the Glenn Road connector road at no cost to the City of Sierra Vista from State Route 92 through this project to connect to the Valley Road alignment at Avenida del Sol. Roadway improvements have been coordinated with Cochise County planning staff. All roadways, sidewalks and multi-modal paths will be designed in accordance with ADA and MAG standards.

4. Open Space Element

The Ventana de Flores Specific Plan conforms to the VISTA 2020 General Plan by dedicating all 100-year flood prone areas to the City of Sierra Vista to maintain the integrity of the existing open space and wildlife corridors. The VISTA 2020 General Plan requires that 10 acres of open space be dedicated for every 1,000 residents, which would be a requirement of approximately 36 acres for the Ventana de Flores Specific Plan. The Specific Plan sets aside approximately 39 acres for open space, 3 acres over the requirement.

The VISTA 2020 General Plan also requires .83 miles of trails for every 1,000 residents, which would be a requirement of approximately 3.05 miles of trails for the Ventana de Flores Specific Plan. The Specific Plan goes above this requirement by providing approximately 3.10 miles of multi-modal paths, .05 miles above the requirement. The Specific Plan also proposes an additional .74 miles of multi-modal paths whose feasibility will be determined during the platting phase. If it is determined that this multi-modal path can be installed within the open space adjacent to the Golden Acres mobile home park without negatively impacting the conveyance capacity or the riparian corridor, the total length of multi-modal paths within the Specific Plan area will be approximately 3.84 miles (.79 miles over the requirement).

5. Growth Element

While the Ventana de Flores Specific Plan area does not fall within one of the Future Growth Area as unidentified in the VISTA 2020 General Plan, it is in close proximity to the Castle and Cooke Growth Area and is a logical extension of other projects also located just south of this Growth Area.

6. Environmental Planning Element

The Ventana de Flores Specific Plan conforms to the VISTA 2020 General Plan by encouraging the use of alternate means of transportation within the development and connecting the pedestrian, bicycle and multi-modal path facilities to existing systems along State Route 92. In addition, Southland Utility Company is an existing, proven private water provider and meets all ADEQ and Sierra Vista Fire Department requirements for water supply, storage and distribution systems. The elimination of the existing sewer ponds and the use of the gravity sewer system will allow for recharge as part of the City of Sierra Vista's overall sewage treatment program. All homebuilders within this development will be required to comply with the Touchstone Energy® Home Program. As discussed previously, existing washes which are the only significant riparian and wildlife corridors in the area will be left natural.

7. **Cost of Development Element**
The Ventana de Flores Specific Plan conforms to the VISTA 2020 General Plan by contributing transportation, recreation, police, fire, and library impact fees to the City of Sierra Vista as well as constructing offsite roadways, multi-modal paths and public parks within the project.

8. **Water Resources Element**
The Ventana de Flores Specific Plan conforms to the VISTA 2020 General Plan by committing to use the plants as listed in Appendix A within public roadways, front yards of all residences and within the passive areas of all parks. Water efficient features in homes will be available as options to all homebuyers. The public parks will be designed with water harvesting techniques in mind and water features will not be allowed (refer to Table 5).

9. **Conservation Element**
The Ventana de Flores Specific Plan conforms to the VISTA 2020 General Plan by maintaining natural wash and wildlife corridors and tying them into passive use within the public area park. The use of drought tolerant plants will minimize the need for groundwater. In addition, all homebuilders within this development will be required to comply with the Touchstone Energy® Home Program.

10. **Parks and Recreation Element**
The Ventana de Flores Specific Plan conforms to the VISTA 2020 General Plan by planning, designing and constructing a public area park and a public neighborhood park, of approximately 20 acres and 5 acres in size, respectively within the development and dedicating the parks to the City of Sierra Vista for public use. Both public parks meet the size designations as listed in the VISTA 2020 General Plan.

11. **Public Facilities and Services and Public Buildings Element**
While no public buildings are proposed within this area, the Ventana de Flores Specific Plan provides an approximately 20 acre public area park adjacent to Sierra Vista Public Schools District property which will potentially be a future school site and is near several public facilities which are being proposed within the larger Tribute Specific Plan to the north. An approximately 5 acre public neighborhood park is also being provided to serve the development's residents and surrounding community.

12. **Housing and Neighborhoods Element**
The Ventana de Flores Specific Plan conforms to the VISTA 2020 General Plan by providing a mix of housing within this development for varying lifestyles and at varying affordability levels. This project will also provide the opportunity for the creation of a new neighborhood association. A homeowners association will be formed for Blocks D, M, N, and O, as shown in Figure 7, to maintain a sewage lift station. Additional homeowners associations may be created as the Specific Plan area is developed.

13. Redevelopment Element

There is no opportunity for the Ventana de Flores Specific Plan to accommodate Element 13 at this location; however, this project is not in conflict with the goals of the VISTA 2020 General Plan Element 13.

14. Safety Element

The Ventana de Flores Specific Plan conforms to the Vista 2020 General Plan by mitigating potential flooding hazards through the preservation of floodplains with flows exceeding 100 c.f.s. and the construction of detention facilities within conformance to the City of Sierra Vista drainage standards. In addition, all police and fire requirements relating to access shall be met.

15. Economic Development Element

While there is no opportunity for the Ventana de Flores Specific Plan to accommodate Element 15 at this location, the plan conforms to Goal 15-2 as it is consistent with City's environmental goals and concerns.

16. Arts and Cultural Element

The Ventana de Flores Specific Plan conforms to the VISTA 2020 General Plan by providing public parks which will provide areas where City of Sierra Vista residents can gather and have recreational opportunities. In addition, since these parks will be dedicated to the City of Sierra Vista, opportunities for cultural events or public art within the parks will be available.

17. Urban Design Element

The Ventana de Flores Specific Plan conforms to the VISTA 2020 General Plan by proposing site designs that:

- Have a mix of residential and recreational uses
- Have multiple lot sized and varying product types
- Are pedestrian friendly
- Provide continuity to the City of Sierra Vista transportation system through the extension of Glenn Road
- Provide continuity of the City of Sierra Vista multi-modal path system by connecting the neighborhood to State Route 92 and connecting State Route 92 to the two proposed public parks
- Will complement the topography
- Will have all utilities located underground
- Will meet all City of Sierra Vista landscaping and buffer requirements

SECTION 4 – CONCEPT PLAN

4 A. Land Use

The Ventana de Flores Specific Plan consists of 335.3 acres and is divided into sixteen land use planning areas. The blocks are generally defined by the project's major infrastructure and by natural conditions such as floodplains (refer to Figure 7). The actual block boundaries will be defined during the platting process. Twelve of the blocks will be residential neighborhoods of varying densities and the other four blocks will provide opportunities for passive and active recreation and be dedicated to the City of Sierra Vista. The residential neighborhoods are proposed to have a maximum of 1,480 residential units within several price ranges. The residential neighborhoods have been planned to create a harmonious transition from the existing residential development in the area.

Table 2: Ventana de Flores Blocks

Block Designation	Acres	Land Use
A	6.8	Open Space
B	7.1	Open Space
C	20.0	Public Area Park
D	17.5	Residential
E	19.2	Residential
F	25.6	Residential
G	21.5	Residential
H	23.3	Residential
I	28.3	Residential
J	29.4	Residential
K	24.3	Residential
L	5.0	Public Neighborhood Park
M	16.4	Residential
N	18.0	Residential
O	26.1	Residential
P	23.9	Residential
Streets	22.9	Public Roadways
Project Total	**335.3**	

Non-Residential Uses

The four non-residential blocks (Blocks A, B, C, and L) help to establish the sense of community by creating both open space for passive recreation and active recreational opportunities within public parks. These four blocks will be dedicated to, and maintained by, the City of Sierra Vista for use by the public. Additional dedication of open space within drainageways and natural floodplain areas along natural washes, as determined through the platting process, will also be dedicated to public. Details on these areas are provided in Section 4C.

Residential Uses
The remaining twelve blocks (Blocks D, E, F, G, H, I, J, K, M, N, O, and P) are designated for residential use. As discussed previously, the goal of this project is to develop a community which will accommodate varying life styles and affordability levels by providing multiple lot sizes and product types.

To accommodate this blend of products, the entire project will be developed under standards similar to the current City of Sierra Vista SFR (Single Family Residence) and MFR (Multi-Family Residence) zoning classifications. The lot sizes and uses are shown in Table 3. The right hand column of the table shows the maximum build out of the community to be 1,480 homes. In addition to the maximum build out for the development, a target number for each product type has been established. The target number is based on current anticipation of market demand.

Table 3: Land Use Summary

Designation	Minimum Lot Size	Useage	Allowable Range of Lots		
			Low	High	Target
SFR 8,000	8,000 square feet	Single Family Detached	191	318	255
SFR 6,000	6,000 square feet	Single Family Detached	168	281	225
MFR 4,500	4,500 square feet	Single Family Detached and Attached	510	850	680
MFR 3,500	3,500 square feet	Single Family Detached and Attached	240	400	320
Total					**1480**

As always, market shifts occur over time and therefore a low and high number has been established for the number of lots in each product type. This is done to ensure that over time the project can accommodate market shifts yet preserve the concept of providing a community for varying life styles and affordability levels. Under no circumstances will the maximum Specific Plan area build out be allowed to exceed 1,480 units. As one product type exceeds its target number, total lot counts of other product types will be reduced. The establishment of minimums for each product type ensures that each will be built within the community and the establishment of the maximum prevents any product type from overshadowing the balance within the community.

The design of this project has incorporated specific features in attempt to minimize impacts to the surrounding developments.

- The existing vegetated drainage pattern between this development and the Golden Acres mobile home park (Blocks A and B) provides a buffer which varies in width from 50 to 200 feet. This buffer will be left as open space.
- All homes will have access from within the development. No lots will face the existing development along either the south or west property boundaries. A block wall with a height of 6 feet will be constructed along these boundaries.
- The plan requires a transition buffer along the plan area perimeter of Blocks I and J (refer to Figure 7). This transition buffer requires that only 8,000 square foot lots be built within 250 feet of the perimeter and restricts the first tier of lots along the perimeter to single-story homes.

- The reconstruction of Canyon de Flores Drive through the Golden Acres mobile home park will include both block walls and landscaping to minimize the noise, and view of the traffic generated by the development. All public improvements within the Canyon de Flores Drive right-of-way through the mobile home park will require approval from the City of Sierra Vista and Cochise County. This roadway configuration is discussed in detail in Section 4B.

Development regulations such as minimum lot dimensions and setbacks have been established for each of the various lot sizes and are included in Section 5.

Entry and internal monuments will be used to define the individual neighborhoods and two public parks. Signage will similarly define individual neighborhoods and connect each to the broader Ventana de Flores Specific Plan area through the use of the City of Sierra Vista's Comprehensive Sign Plan.

Some of the Specific Plan neighborhoods may be developed as age restricted or private communities, and the Ventana de Flores Specific Plan permits the use of access gates on private streets. Any gates within the Specific Plan area will have an override system for emergency services and there will be separate pedestrian gates. All private roadways will meet minimum City of Sierra Vista pavement requirements and emergency access road standards.

4 B. Traffic

The Ventana de Flores Specific Plan's traffic and circulation plan consists of a combination of roadways, multi-modal paths, and pedestrian access designed to enhance the overall value of the community and promote safe and efficient mobility for residents of all ages. Both Canyon de Flores Drive and Glenn Road are classified as collector streets, and will serve as the main access routes to State Route 92 from this development (refer to Figure 9). The internal roadway system is planned with the intention of effectively distributing traffic throughout the community and mitigating any possible impacts on existing residential development within the area. The community is designed in conjunction with planned multi-modal paths to promote a pedestrian and bicycle friendly environment.

Planning is currently in process to connect Canyon de Flores Drive and Golden Acres Drive. This realignment will direct the majority of the traffic to the signalized intersections with State Route 92. It is planned that Canyon de Flores Drive will be extended eastward to connect with the existing Golden Acres Drive, and that it will serve as access to State Route 92 for the Golden Acres mobile home park and Ventana de Flores Specific Plan development. The Canyon de Flores Drive extension will connect with Glenn Road, which will be extended through the project from its current location on the west to connect with the Avenida del Sol alignment. Glenn Road will also serve as a primary access route to a signalized intersection with State Route 92 (refer to Figure 10).

The existing 280-unit Golden Acres mobile home park to the north of the project area and the 347-unit Buffalo Soldier Ranch development would make almost exclusive use of the realigned Canyon de Flores Drive for access to State Route 92. Buffalo Soldier Ranch is currently in the design process and is located northwest of the Golden Acres mobile home park along the Canyon de Flores Drive alignment (refer to Figure 1). Refer to Appendix F for complete Traffic Report.

The traffic analysis, prepared as part of the Specific Plan, has determined that a total of four lanes of traffic are needed to serve both the existing traffic demand and the entire Ventana de Flores Specific Plan development. Both Canyon de Flores Drive and Glenn Road will be developed as roadways with two travel lanes in each direction. Based on the traffic analysis Canyon de Flores Drive can handle the existing development plus the first 820 units within this Specific Plan development. The extension of Glenn Road from the west property line to State Route 92 shall be constructed prior to the closing of 820 homes within the Ventana de Flores Specific Plan. No additional occupancy permits shall be issued until Glenn Road has been completed.

Once completed, the extension of Glenn Road as a two-lane undivided road will add additional capacity to serve the remaining Ventana de Flores Specific Plan development. Based on the layout of the Ventana de Flores Specific Plan development, approximately 55% of trips generated by this development would access State Route 92 via Canyon de Flores Drive, and 45% would use Glenn Road for State Route 92 access. The extension of Glenn Road will be constructed by the developer to provide adequate access for the completion of the development.

A connection will also be made to Campobello Avenue to the south to allow residents in these neighborhoods to access the signalized intersection of Glenn Road and State Route 92. This connection will not be made until after the Glenn Road connection is completed. Campobello Avenue will terminate at its intersection with Glenn Road.

Multi-modal paths along Canyon de Flores Drive and Glenn Road will be constructed to connect the Ventana de Flores Specific Plan area with the existing and future Sierra Vista Trails System along the west side of State Route 92. An internal multi-modal path will also be constructed as separate paths along the roads as shown on Figure 9, including access from Glenn Road to the approximately 20 acre public area park. The multi-modal path is also planned for the Avenida del Sol alignment along the eastern boundary of the Specific Plan area and will be constructed along with Blocks D, M, and O. The developer will enter into a development agreement with the City of Sierra Vista and will post a bond for the eventual construction of the road along the Avenida del Sol alignment. The total length of this multi-modal path system is approximately 3.10 miles.

The Specific Plan also proposes an additional .74 miles of potential multi-modal paths within Blocks A and B whose feasibility will be determined during the platting phase. This potential multi-modal path would connect with the multi-modal paths at both Glenn Road and Canyon de Flores Drive. If it is determined that this potential multi-modal path can be installed without negatively impacting the conveyance capacity or the riparian corridor within the open space, the total length of the multi-modal path system will be approximately 3.84 miles.

This system of at least 3.10 miles of multi-modal paths is a commitment to encourage residents of all ages to maintain healthy lifestyles. They will provide a safe means of traveling to the public parks within the development will connect the Ventana de Flores Specific Plan area and create more transit and active recreation options for residents of the development and surrounding community.

All collector streets within the Specific Plan will be constructed to City of Sierra Vista standards. These streets will be constructed with 48 feet of pavement (plus 4 feet of

curb and gutter which complete the 52 feet roadway section) and will be striped as a four lane roadway. In addition, the roadways will provide a 4 foot sidewalk on one side and a 10 foot multi-modal path on the other (refer to Figure 10). To reduce noise and the visual impacts for the Golden Acres mobile home park, the roadway cross section will be modified within their neighborhood to include both block walls and landscaping (refer to Figure 11 and Figure 12). Block walls will be staggered and include pedestrian access points to allow the Golden Acres mobile home park to remain connected. All onsite and offsite roadway improvements addressed herein will be dedicated to the public and will be constructed entirely by the developer.

As part of the Specific Plan process, residents of surrounding neighborhoods expressed concern about the increased traffic that will occur on Canyon de Flores Drive within the Golden Acres mobile home park. To maintain safety of the residents, stop signs and bus pullouts along with the roadway were requested. Possible speed control devices would only be constructed along the roadway if warranted based upon analysis in conformance with the Manual on Uniform Traffic Control Devices, and as evaluated per the City of Sierra Vista's Traffic Calming Policy. Bus pullouts may be approved at the discretion the City of Sierra Vista's Transit Division. Figure 13 shows possible locations for such improvements within this neighborhood.

4 C. Recreational Facilities

The Ventana de Flores Specific Plan provides an approximately 20 acre public area park site which will serve the nearby residents as well as the entire City of Sierra Vista, located in Block C. This park site will provide approximately 10 acres of active recreation use. It will also provide approximately 10 acres for passive recreation through the use of pedestrian paths and rest and relaxation areas in and adjacent to the 100-year floodplain. Coordination of the passive uses within the 100-year floodplain will be coordinated with and will require approval of the City of Sierra Vista Engineer and Parks & Recreation Director. These improvements will not be made within the 100-year floodplain or any area designated as a Natural Drainage Maintenance Corridor per the City of Sierra Vista's Surface Water Plan. This park will also be connected to the multi-modal path system as well as be made accessible to the public via a connection from Glenn Road. A conceptual park plan for this area is included in Figure 14.

An approximately 5 acre public neighborhood park will be constructed in a central location within the Ventana de Flores Specific Plan area in Block L. The park will provide opportunities for active recreation and will be developed with room for amenities such as a half soccer field, dog run, a basketball area and a children's play area. This park will be accessible by both Canyon de Flores Drive and Glenn Road as well as by the multi-modal path system. A conceptual park plan for this area is included in Figure 15.

While the Ventana de Flores Specific Plan area has relatively gently sloping topographic characteristics, the wash area bordering the Golden Acres mobile home park on the north boundary and along the southeast corner of the Specific Plan will be preserved as open space to encourage the preservation of wildlife corridors. This area has been established as Blocks A and B. A potential multi-modal path is proposed through Blocks A and B and would be constructed in a way that would protect the continuity of flood control conveyance and riparian connections. This potential multi-modal path will connect with the multi-modal paths at both Glenn Road and Canyon de Flores Drive.

The open space and multi-modal paths will provide an area where residents can enjoy the native environment.

The concept plans included herein are provided to indicate a concept of what these parks may include and a general level of amenities. The actual amenities and configuration of the park sites will be developed in conjunction with City of Sierra Vista Parks & Leisure Department.

4 D. Public Facilities

Electricity

Electricity will be provided by Sulphur Springs Valley Electric Company. To maximize energy efficiency, the homebuilders within this development will be required to meet the conditions of the Touchstone Energy® Home Program.

Water

Water service will be provided by Southland Utility Company, which has previously obtained a 100-year assured water supply. The utility company will be developing an additional well and storage to serve this development. The water supply system will be designed to meet Arizona State and the City of Sierra Vista standards. The system shall also meet the requirements of the officially adopted Fire Code or an equivalent alternative.

Natural Gas

Natural gas will be provided by Southwest Gas.

Sewer

Sewer service to this area and the Golden Acres mobile home park is currently provided by two sewage treatment ponds and an evaporation field. A sewage line has been planned to extend to the Ventana de Flores Specific Plan area from the north and will serve both the Ventana de Flores Specific Plan area and the Golden Acres mobile home park. This sewer main will be completed prior to the construction of any homes within this area. Sewer service will be provided by the City of Sierra Vista.

The eastern portion of the site (Blocks D, M, N, and O) will require the construction of a sewage pump station and force main to lift the sewage to an elevation so that it can drain into the public sewer connection. This pump station will be constructed by the developer and maintained by the homeowner's association until such time that a public sewer main is constructed that can drain this area by gravity. At such time as this occurs, the lift station will be taken out of operation and a gravity connection will be made. The deactivation of the lift station will be the responsibility of the homeowner's association.

Communications

Communications services will be provided by both Qwest and Cox. Qwest services include DSL internet access, telephone, and satellite television. Cox services include cable television, digital cable television, high-speed internet access, and digital telephone.

4 E. Drainage

All floodplains with flows exceeding 100 c.f.s. will be left natural and will be dedicated to the City of Sierra Vista. Surface flows will be carried in roadways or drainageways in accordance with City of Sierra Vista requirements. Any drainageways constructed as part of this development will also be dedicated to the City of Sierra Vista.

Conformance with the City of Sierra Vista's drainage standards will include the construction of detention facilities. These facilities will be constructed as a part of the individual neighborhoods, not as part of the installation of the roadway infrastructure. If roadway infrastructure is constructed before the detention facilities have been completed, temporary drainage improvements may be required by the City of Sierra Vista during the preliminary platting process.

4 F. Grading

The Ventana de Flores Specific Plan area has relatively gently sloping topographic features. The grading will be done in a manner to be generally consistent with the existing topography. The grading plan will establish road grades that are consistent with those of the existing city streets around the site, and provide stable building sites for the residential, public facilities and recreation amenities, and balance the cut and fill grading quantities onsite.

4 G. Landscape

The Ventana de Flores Specific Plan will be landscaped in manner which complements and enhances the existing Semidesert Grassland vegetative community. The Specific Plan area is currently vacant and characterized by scrub vegetation with an under story of perennial grasses. The wash on the northwestern border of the Specific Plan area (Blocks A and B) will be preserved as open space and will act as a wildlife corridor from the west to northeast end of the development. A natural open space area on the southeast corner of the Specific Plan area will also be preserved. Both planned open space areas contain groves of mesquite and Whitethorn acacia which will be preserved.

Where possible, the approximately 20 acre area and approximately 5 acre neighborhood public parks will also be landscaped with drought tolerant, low maintenance vegetation to complement the natural vegetation and lessen water supply impacts. The public area park will connect to and create a transition from the open space area it will border.

The collector streets, Canyon de Flores Drive and Glenn Road, will both be landscaped with both native and drought tolerant, low maintenance species to lessen the development's impact on water supply. All public roadways within the development will be dedicated to the City of Sierra Vista. The City of Sierra Vista will maintain and make any necessary repairs to watering systems. Landscape buffering may also be used along the Specific Plan's east and south boundaries, on both Wakefield Drive and San Pedro Avenue.

The Ventana de Flores Specific Plan commits to use vegetation from the City of Sierra Vista Plant List (refer to Appendix A) for both the streetscape and within front yards of individual lots to promote the water-conserving xeriscape concept.

SECTION 5 – SPECIFIC PLAN IMPLEMENTATION

5 A. Objectives

The Ventana de Flores Specific Plan creates a 335.3 acre cohesive development with multiple options for housing as well as opportunities for public active and passive recreational uses for the community and the surrounding area. The development will promote the health, safety and general welfare of future residents and property owners of the Specific Plan area by providing zoning districts, development and land uses as well as standards for implementation of the Specific Plan. All housing is single family and varies from both attached and detached single family residences on 3,500 and 4,500 square foot lots to detached single family residences on 6,000 and 8,000 square foot lots. This diversification allows for both varying lifestyles as well as varying price ranges. The development will include a public area park and a public neighborhood park, of approximately 20 acres and 5 acres in size, respectively.

The specific plan regulations will apply only to the property situated within the Specific Plan area. If a situation arises that is not specifically provided for within these regulations, the City of Sierra Vista Development Code will apply.

5 B. Compatibility of Plan

The residential, recreational, and open space land uses associated with the Ventana de Flores Specific Plan are complementary to the land uses surrounding the site. Currently, much of the land west of State Route 92 is undeveloped and generally lies outside of the City of Sierra Vista. Those areas that have been developed are generally residential except for commercial uses along the highway frontage. The property owned by the Sierra Vista Public Schools District and the Bureau of Land Management north of the northeast corner of the Specific Plan site is within the municipal boundaries of the City of Sierra Vista. The Golden Acres mobile home park to the northwest and properties along the western, southern, and eastern boundaries of the Specific Plan area are within Cochise County (refer to Figure 1).

The adjoining properties are either undeveloped or residential (refer to Figure 2). The most intense contiguous use is the Golden Acres mobile home park along the northwesterly boundary. There is also lower density development along the western boundary and portions of the southern boundary. The undeveloped property along the entire eastern boundary is currently owned by the Arizona State Land Trust and will be sold for development in the future. There are two undeveloped parcels along the northern boundary line. One is owned by the United States Bureau of Land Management, the other is owned by the Sierra Vista Public Schools District. The school district has planned the development of a school adjacent to this property. At this time they have no plan or time frame for any construction.

Table 4. Specific Plan Residential Development Requirements

Designation	SFR 8,000		SFR 6,000		MFR 4,500		MFR 3,500		
	Allowed	Proposed	Allowed	Proposed	Allowed	Proposed	Allowed	Proposed	Proposed
Usage	Single Family Detached	Single Family Detached	Single Family Detached	Single Family Detached	Single Family Attached & Detached	Single Family Attached & Detached	Single Family Attached	Single Family Attached	Single Family Detached
Minimum Lot Size (square feet)	8,000	8,000	6,000	6,000	4,500	4,500	2,400	3,500	3,500
Minimum Lot Width (feet)	NA	NA	NA	NA	NA	NA	28	28	28
Minimum Lot Depth (feet)	NA	NA	NA	NA	NA	NA	NA	NA	NA
Maximum Building Height (feet)	28	28	28	28	28	28	28	28	28
Front Setback (feet)	25	20	20	20	20	20	20	20	20
Rear Setback* (feet)	25	20	20	20	15	15	10	10	10
Interior Side Setback (feet)	7	7	5	5	5[#]	5[#]	0	0	5[#]
Street Side Setback (feet)	10	10	10	10	10	10	NA	10	10
Corner Lot / Corner Lot Abutting Key Lot Setback Criteria	On any corner lot that abuts a key lot or is separated therefrom by an alley, any structure, other than a fence, exceeding 3 feet in height shall be setback from the side lot line not less than the minimum front setback required for the key lot.				On a corner lot that abuts a key lot or is separated therefrom by an alley, any structure, other than a fence, exceeding 3 feet in height shall be setback from the side lot line not less than the minimum front yard setback required for the key lot. A 6 foot tall fence or wall for a corner lot may be constructed 5 feet from the side property line.				

[*] The rear setback is measured from the covered patio to the property line, in the case that there is no covered patio the rear setback is measured from the house to the property line.
[#] If the dwelling is to be a zero lot-line house, then one side yard setback would be 0 feet, and the other would be a minimum of 8 feet.

5 C. Specific Detailed Zoning Regulations

The residential blocks within the Ventana de Flores Specific Plan will be developed under the development requirements as shown in Table 4 for the SFR 8,000, SFR 6,000, MFR 4,500, and MFR 3,500 designations. Table 4 shows the currently allowed standards under the City of Sierra Vista Development Code as well as the proposed standards for the Ventana de Flores Specific Plan. Should the City of Sierra Vista revise development requirements for either the SFR or MFR designations subsequent to the adoption of this specific plan, the development requirements specifically listed in Table 4 will continue to be in effect.

All homes will have access from within the development. No lots will face the developments along either the south or west property boundaries. A block wall with a minimum height of 6 feet will be constructed along these boundaries. In addition, the plan requires a transition buffer along the plan perimeter of Blocks I and J. Only the largest lots in this development (8,000 square foot single family detached units) will be allowed in the first 250 feet adjacent to the perimeter and the first tier of lots along the perimeter will be restricted to single-story homes (refer to Figure 7).

Buffer distances will be in accordance with the City of Sierra Vista Development Code and Surface Water Plan.

5 D. Architectural Guidelines

The CC&Rs for the Ventana de Flores Specific Plan will generally contain provisions for the establishment of an Architectural Review Committee (ARC). The purpose of this committee is to ensure that the architectural design guidelines for all development within the Specific Plan, and any other restrictions or standards imposed by the CC&Rs, are administered in conformance with the CC&Rs. Approval by the ARC is required prior to the submittal of plans to the City of Sierra Vista for issuance of building permits unless otherwise provided for in the CC&Rs.

5 E. Drainage Strategy

Very little offsite drainage impacts the Ventana de Flores Specific Plan area. An analysis has been performed on this property to quantify the runoff entering this site and to calculate 100-year flood prone limits for all flows in excess of 100 c.f.s. There are only three areas on the property which have flows of this magnitude. The primary one is the drainage pattern which lies along the northwest boundary, adjacent to the Golden Acres mobile home park. The second area is along the southern boundary on the east side of this site. Much of the flood prone area along this wash lies outside of this development. Of a lesser magnitude is a small 100-year floodplain which begins just west of the eastern boundary. All of the 100-year flood prone areas will be left entirely in their natural state. This will protect vegetative and wildlife corridors as well as provide opportunities for continued groundwater recharge.

In the developed portions of the site, surface runoff will be conveyed within roadways or small channels. Detention basins will be utilized in accordance with City of Sierra Vista regulations to mitigate the increased runoff created by the development.

All natural and constructed watercourses, including detention basins, will be dedicated to and maintained by the City of Sierra Vista. Further analysis of drainage conditions and proposed handling of drainage will occur at the preliminary plat stage.

5 F. Configuration and Criteria for Phasing and Maintenance of Roadways

The major roadways within the development are Canyon de Flores Drive and Glenn Road and are classified as collector roadways. Canyon de Flores Drive is currently in the design phase to be realigned to connect to the Golden Acres Drive alignment. The Glenn Road extension will be aligned within the development to connect to the Valley Road alignment on the east side of the development. A Comprehensive Plan Amendment is currently being processed by Cochise County to make a minor adjustment to the Sierra Vista Area Traffic Circulation Plan.

There will be no residential units fronting on either Wakefield Drive or San Pedro Avenue, along the south and east boundaries of the Specific Plan area. Consequently no roadway improvements will be constructed on either of these roadways.

Construction of the extension of Canyon de Flores Drive through the Golden Acres mobile home park will be completed in the first phase of infrastructure improvements and will be completed prior to closing and occupancy of any homes within the Specific Plan area.

The extension of Glenn Road from the west property line to State Route 92 shall be constructed prior to the closing of 820 homes within the Ventana de Flores Specific Plan. No additional occupancy permits shall be issued until Glenn Road has been completed.

The Avenida del Sol roadway will be designed but not built, as no traffic generated by the development will utilize it. The developer will enter into a development agreement with the City of Sierra Vista and will post a bond that will remain in effect for a period of 5 years after the last home is closed within the project. If at that time neither the northerly or southerly extension of the Avenida del Sol alignment exists, the bond will be allowed to be released.

This project will be built in phases and each residential block will be a separate construction phase. The major roadway collectors which are not within blocks, i.e., Canyon de Flores Drive, Glenn Road extension, etc., will be phased as well. The full roadway section for each of these collectors will be built along with the first adjacent development for the length of that development's frontage. For example, if development of Block G precedes development of Block H, construction of the full Canyon de Flores Drive roadway section will be required along the entire length of H at the time of development. When Block H is subsequently constructed, the roadway improvements will already be in place. The adjacent collector road improvements will be completed prior to closing and occupancy of any homes within the adjacent block.

The collector streets within the Specific Plan, Canyon de Flores Drive and Glenn Road, will be constructed to City of Sierra Vista pavement standard and will be striped as four lane roadways. In addition, the roadways will provide a 4 foot sidewalk on one side and a 10 foot multi-modal path on the other (refer to Figure 10).

Roadway and multi-modal path maintenance of Canyon de Flores Drive and Glenn Road between the development and State Route 92 will be provided by City of Sierra Vista through either an annexation of the roadways or an intergovernmental agreement with Cochise County at time of construction. These arrangements will be made by the City of Sierra Vista. Should this intergovernmental agreement or annexation not be completed,

the roadways will be maintained by Cochise County; however, failure to complete these arrangements will not interfere with the ability of the developer to develop this site.

5 G. Configuration and Criteria for Phasing and Maintenance of Sewage Disposal, Effluent Use, Storm Water, Drainage, and Public Utilities

Utilities and services for this development will be provided by the following public and private entities:

- Sewage treatment and disposal will be provided by the City of Sierra Vista. The owner of the property is also the owner of the existing sewage treatment facility that serves the Golden Acres mobile home park. The owner of the property is currently in the process of connecting the sewage collection line to tie into the City of Sierra Vista's sewer system to the north. Once completed, the existing treatment plant will be eliminated in accordance with the State of Arizona's Department of Environmental Quality standards. The sewage from the Golden Acres mobile home park as well as all flows from this development will be taken to the public sewer line.
- Blocks D, M, N, and O will be served by a temporary lift station, to be constructed by the developer. After construction, the lift station will be owned, operated, and maintained by a homeowner's association. The homeowner's association will be responsible for the deactivation of the lift station when gravity flow is made available to the area.
- There will be no effluent use in this development as there is no access to effluent in this area.
- Drainage and storm water will be handled in accordance with City of Sierra Vista's development standards. The drainageways and detention basins will be dedicated to, and maintained by, the City of Sierra Vista.
- Solid waste disposal will be handled by the City of Sierra Vista.
- Electricity will be provided by Sulphur Springs Valley Electric Cooperative.
- Water supply will be private and will be provided by Southland Utility Company.
- Natural gas will be provided by Southwest Gas.
- Fire protection and emergency services will be public and will be provided by the Sierra Vista Fire Department.
- Residents of the development will be in the Sierra Vista Public Schools District and will attend Village Meadows Elementary School, Huachuca Mountain Elementary School, Apache Middle School, Sierra Vista Middle School and Buena High School.

Phasing of these improvements will be accomplished to provide adequate infrastructure for future residents at all times.

5 H. Criteria for the Conservation, Development, or Utilization of Natural Resources

As discussed in the vegetative analysis, with the exception of the two washes, there is little significant vegetation on the site. Concentrated surface water flows along the northwest boundary and in the southeast corner of the site will be left in their natural state. This will provide for the protection of existing vegetation along these water courses which constitutes the majority of the vegetation on the entire development. In addition, leaving the floodplains undisturbed allows for continuity of wildlife movements

and continuation of groundwater infiltration. All Native Plant Salvage requirements will be followed as required in the City of Sierra Vista Development Code.

5 I. Water Conservation

Water conservation will be both required and encouraged for both homebuilders and the future residents in this development. Water Conservation Measures closely follow the Upper San Pedro Partnership's Water Conservation Model Ordinance as shown in Table 5.

Table 5: Water Conservation Measures

Measure	Ventana de Flores Specific Plan	City of Sierra Vista*	Upper San Pedro Partnership**
Low Flow Toilets	R	R	R
Low Flow Showerheads	R	R	R
Low Flow Faucets	R	R	R
Evaporative Cooling	Not allowed	Allowed with water recycling	Not allowed
Decorative Fountain	Not allowed	Allowed with water recycling	Not allowed
Insulated Hot/Cold Water Pipes	R	R	R
Hot Water Recirculation System	R	R	R
Water efficient appliances	R*	-	-
Plant List (distributed to homeowners in CCR's)	R	-	R
Turf Grass Limit	R (400 sq ft)	-	R (600 sq ft)
Turf Grass Banned in Front / Side Yards	R	-	R
Gutters	R*	-	-
Gray Water Valve	R*	-	R
Rainwater Harvesting	-	-	R
Swim Pool / Spa Covers	R	R	R
Cartridge Type Filters Required for Pools / Spas	R	-	R
No Water Features in Common Areas	R	-	R
Multi-station Irrigation Controls	R	-	-
Drip Irrigation Systems for Non-turf Areas	R	-	R
Rain-sensors in Irrigation Systems	R	-	R

*Sierra Vista Development Code – Article 151.16 Water Conservation
**Water Conservation Model Ordinance
R = Required
R* = Required to be offered as option to homebuyer

Water conservation measures that will be implemented as part of the Ventana de Flores Specific Plan include:

- Water wise landscaping techniques will be utilized within the Specific Plan's common areas, open spaces, and neighborhood and area public parks. This measure will minimize the reliance on turf and require the use of drought tolerant, native, and drip irrigation plant species. Appropriate landscaping design guidelines will be included in the CC&Rs for the proposed project area.
- Planting in all residential, open space and park areas shall follow City of Sierra Vista Plant List, included in Appendix A. Where practical, native plant materials will be salvaged for use in parks and common areas to provide mature specimens which require less water.
- Water features, such as fountains and waterfalls, will not be allowed.
- Installation of water-efficient fixtures and appliances and gray water valves will be offered as options for homebuyers.
- The use of turf in this project will be discouraged in general and if used will be limited by the CC&Rs. Turf will not be allowed in front or side yards and turf in the back yard will be restricted to a maximum of 400 square feet.
- Prior to occupancy of any homes within any block of the development, a Water Conservation document will be prepared for future homeowners. The document will emphasize the need to conserve water, document water conservation measures built into their home, suggest areas where the homeowners can increase conservation and provide a list of water conservation measures that are outlined in the CC&Rs with which they are obligated to comply.

Water reuse for the Ventana de Flores Specific Plan will be accomplished through water harvesting and will be implemented as part of the parks design as deemed practical by the City of Sierra Vista.

Water augmentation measures that will be implemented as part of this development include:

- Storm water detention will be utilized either within each block or on an area wide basis. These basins will promote aquifer recharge.
- All significant washes will remain in their natural state, further contributing to aquifer recharge in the Specific Plan area.

Home construction water conservation measures that will be implemented as part of this development include:

- Hot water recirculation pumps
- Faucet aerators
- Low-flow plumbing fixtures, such as shower heads and toilets
- Water efficient appliances will be offered in all homes
- Gray water valves will be offered in all homes
- Gutters will be offered in all homes
- Drip irrigation systems – no spray irrigation for non-turf areas
- Multi-station irrigation controls
- Rain-sensors in irrigation systems
- Evaporative coolers will not be allowed

- Swimming pool covers will be required if a swimming pool is constructed as an option with the house

Common area water conservation measures that will be implemented as part of this development include:

- Drip irrigation systems – no spray irrigation for non-turf areas
- Multi-station irrigation controls
- Rain-sensors in irrigation systems

In addition to the aforementioned water conservation measures, the Ventana de Flores Specific Plan will adhere to all water mitigation measures as required per the City of Sierra Vista Development Code.

5 J. General Landscape Program

The Ventana de Flores Specific Plan will provide landscaped public roadways as well as natural open space areas and two public parks. The open space areas in Blocks A and B will be generally left undisturbed, although a potential multi-modal path is proposed through which would be constructed in a way that would protect the continuity of flood control conveyance and riparian connections. The two public collector roadways, Canyon de Flores Drive and Glenn Road, will provide a continuation of the City of Sierra Vista's multi-modal path system and will be landscaped. The landscape materials in all public roadways will consist of drought tolerant, low maintenance planting materials. The two public parks will be a combination of turf recreation areas as well as xeriscape areas for passive recreational uses.

The project will also commit to the use of native and drought tolerant vegetation in individual front yards to be provided by the homebuilders.

5 K. Recreational Facilities

The recreational facilities, an approximately 5 acre public neighborhood park and an approximately 20 acre public area park, will be designed in general conformance with the concept plans included in Figure 14 and Figure 15. However, actual park layout and amenities will be designed in coordination with the City of Sierra Vista Parks & Leisure Department. Potential negative effects of light pollution or other impacts on nearby residential areas will be considered during the design phase of the park.

Development of the recreational facilities within the development will be phased. It is important that the developer have some flexibility relative to the timing of construction of the recreational elements of the specific plan. This flexibility will allow a decision on timing of these elements that will consider both the marketing value and the cash flow associated with these improvements. However, the first park will be constructed along with the infrastructure required for the plat that includes the 300th lot within this specific plan. The second park will be constructed along with the infrastructure required to serve the lots in the last block of the development. If the developer chooses to accelerate the timing of either of these parks, it must be determined that the City of Sierra Vista is ready to accept maintenance responsibility prior to the developer dedicating these facilities. The order of construction of the two parks will be solely the developer's decision.

5 L. Impact Fees

The developer will contribute transportation, recreation, police, fire, and library impact fees in accordance with City of Sierra Vista Development Code requirements. Transportation impact fees will provide for the future construction of the Avenida del Sol alignment adjacent to this development, as well as other principal arterial roadways in the area. Park impact fees will be offset by the cost of construction of the 3.10 to 3.84 miles of multi-modal paths as well as the cost of construction and the land value of the approximately 20 acre public area park.

5 M. Project Phasing

The Ventana de Flores Specific Plan development will be built in multiple phases. Phasing is necessary to provide adequate levels of infrastructure to accommodate the development in each phase and to allow portions of the property to remain undisturbed as others are developed. This will minimize disturbance of certain portions of the property until the market is prepared to accept additional housing units.

Phasing also allows the developer to consider changes in the housing market and to stagger the introduction of a variety of units. Site grading will not occur on blocks until construction is ready to begin on utilities, roadway and housing.

Project phasing will be in accordance with Figure 16. Village A includes Blocks A, B, E, F, G, H; Village B includes Blocks I, J, K, P; and Village C includes Blocks D, M, N, O. One of the parks, either the approximately 20 acre public area park (Block C) or the approximately 5 acre public neighborhood park (Block L) will be constructed at the same time as improvements for the plat that includes the 300th lot within this specific plan. The second park will be constructed along with the infrastructure required to serve the lots in the last block of the development. If the developer chooses to accelerate the timing of either of these parks, it must be determined that the City of Sierra Vista is ready to accept maintenance responsibility prior to the developer dedicating these facilities. The order of construction of the two parks will be solely the developer's decision.

Construction of project infrastructure will be completed in accordance with Sections 5 E through 5 G.

5 N. Provisions to Update the Specific Plan

The Ventana de Flores Specific Plan shall be administered and enforced by the City of Sierra Vista Department of Community Development in accordance with the provisions of the City of Sierra Vista Development Code. Certain changes to explicit provisions in the Specific Plan may be made administratively by the City Manager or his/her designee. These might include:

1. The addition of new information to the Specific Plan maps or text that does not change the effect of any regulations or guidelines.

2. Changes to the community infrastructure, such as drainage, water, and sewer systems, which do not have the effect of increasing or decreasing development capacity in the Specific Plan area, nor change the concepts of the Plan.

3. The determination that a use be allowed which is not specifically listed as permitted but which may be determined to be similar in nature to those uses explicitly listed as permitted and is consistent with the goals and objectives of the Specific Plan.

FIGURES

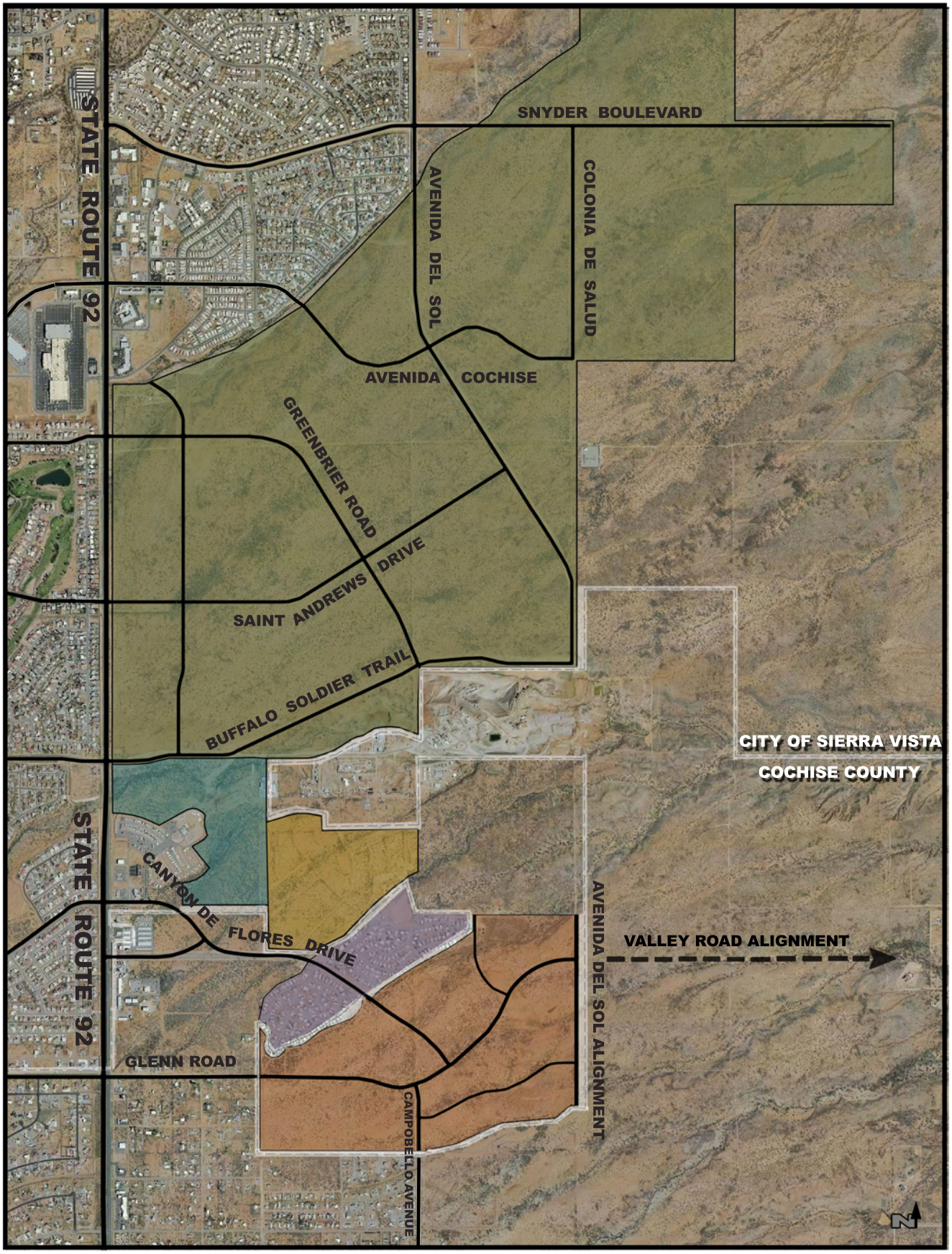


FIGURE 1: REGIONAL LOCATION MAP

- TRIBUTE SPECIFIC PLAN
- GOLDEN ACRES MOBILE HOME PARK
- VENTANA DE FLORES SPECIFIC PLAN
- PUEBLO DEL SOL RV PARK
- BUFFALO SOLDIER RANCH

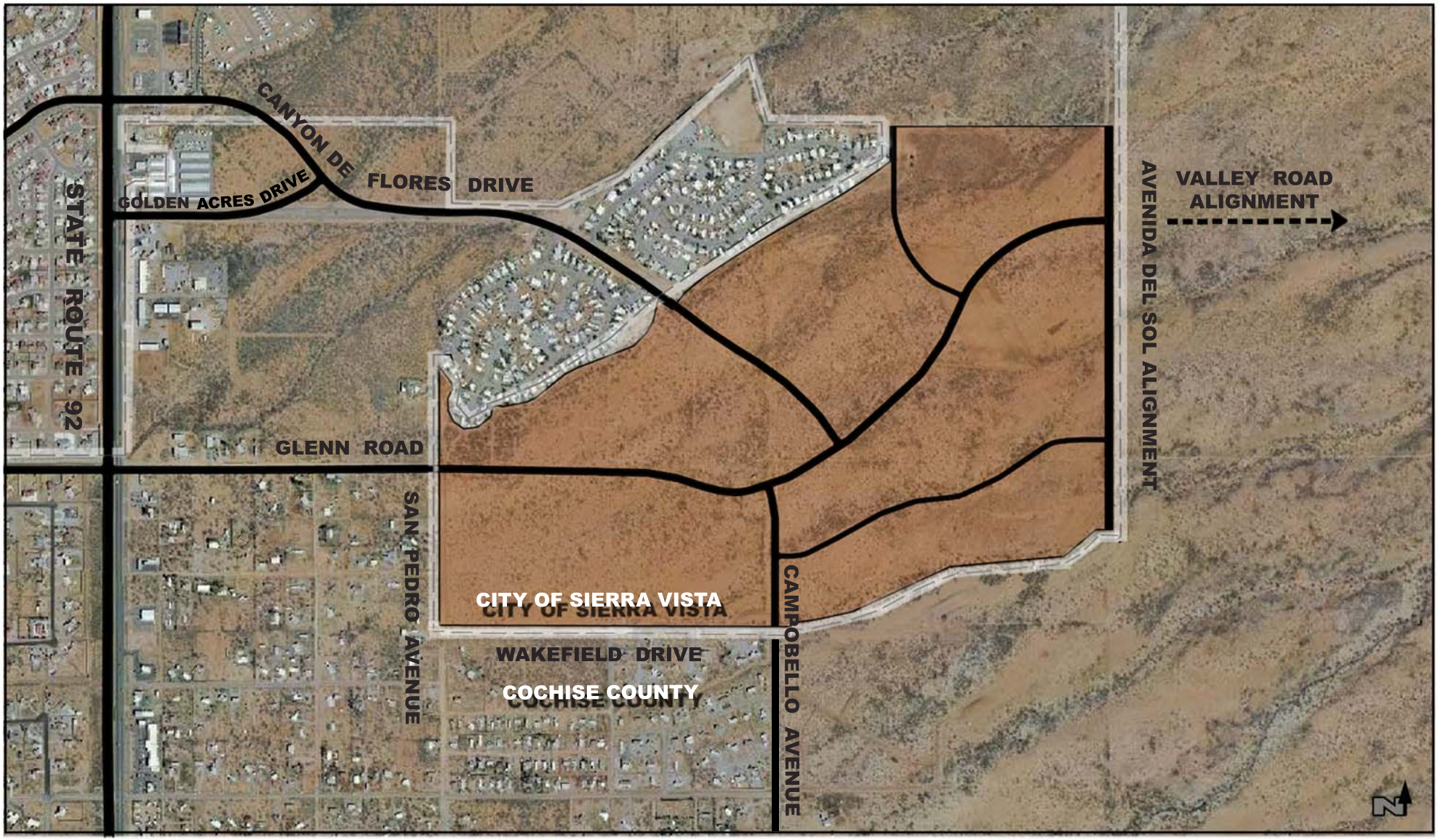


FIGURE 2: SITE LOCATION

VENTANA DE FLORES SPECIFIC PLAN

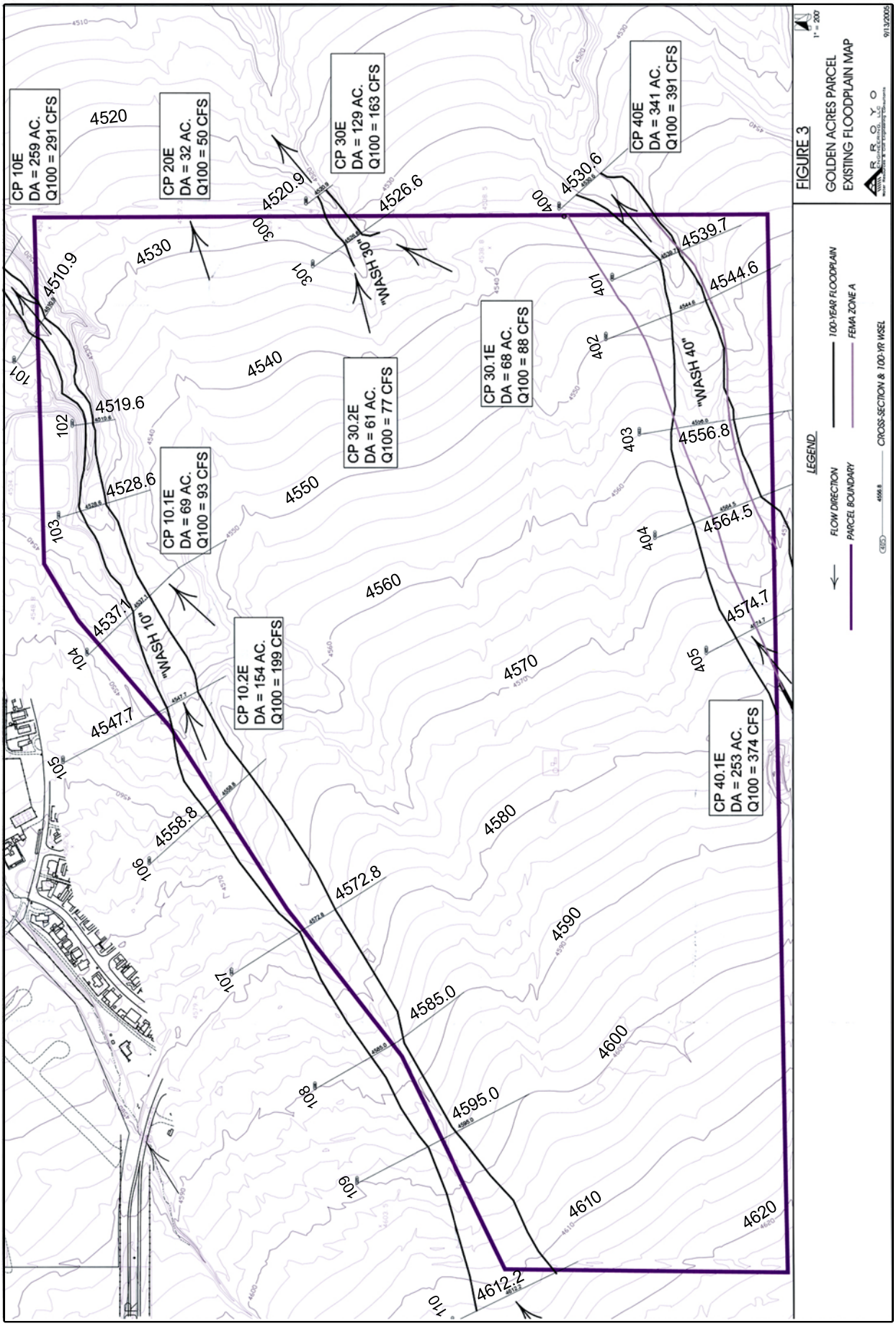


FIGURE 3: FLOODPLAIN LIMITS

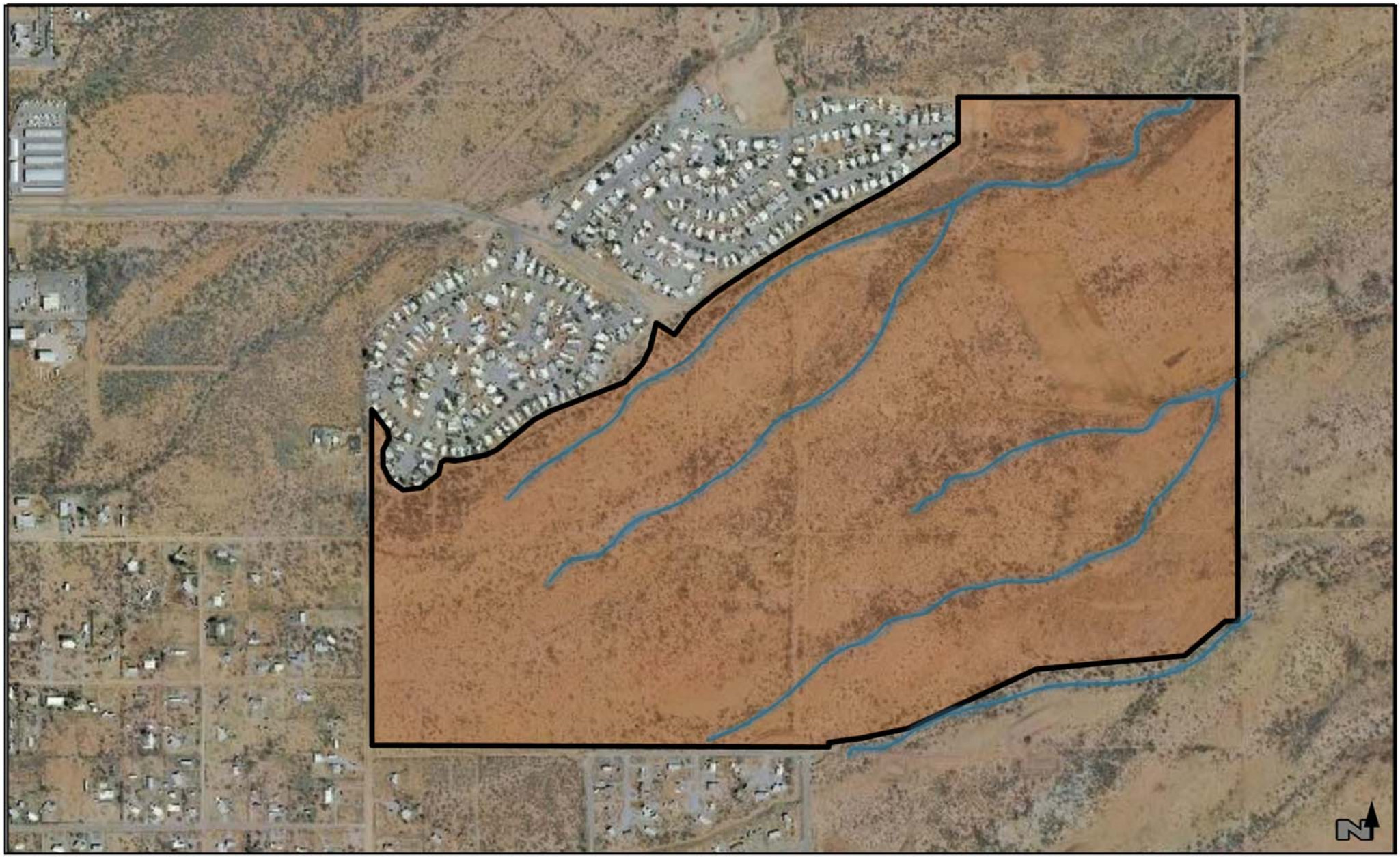


FIGURE 4: 404 LIMITS

VENTANA DE FLORES SPECIFIC PLAN

APPROXIMATE 404 LIMITS

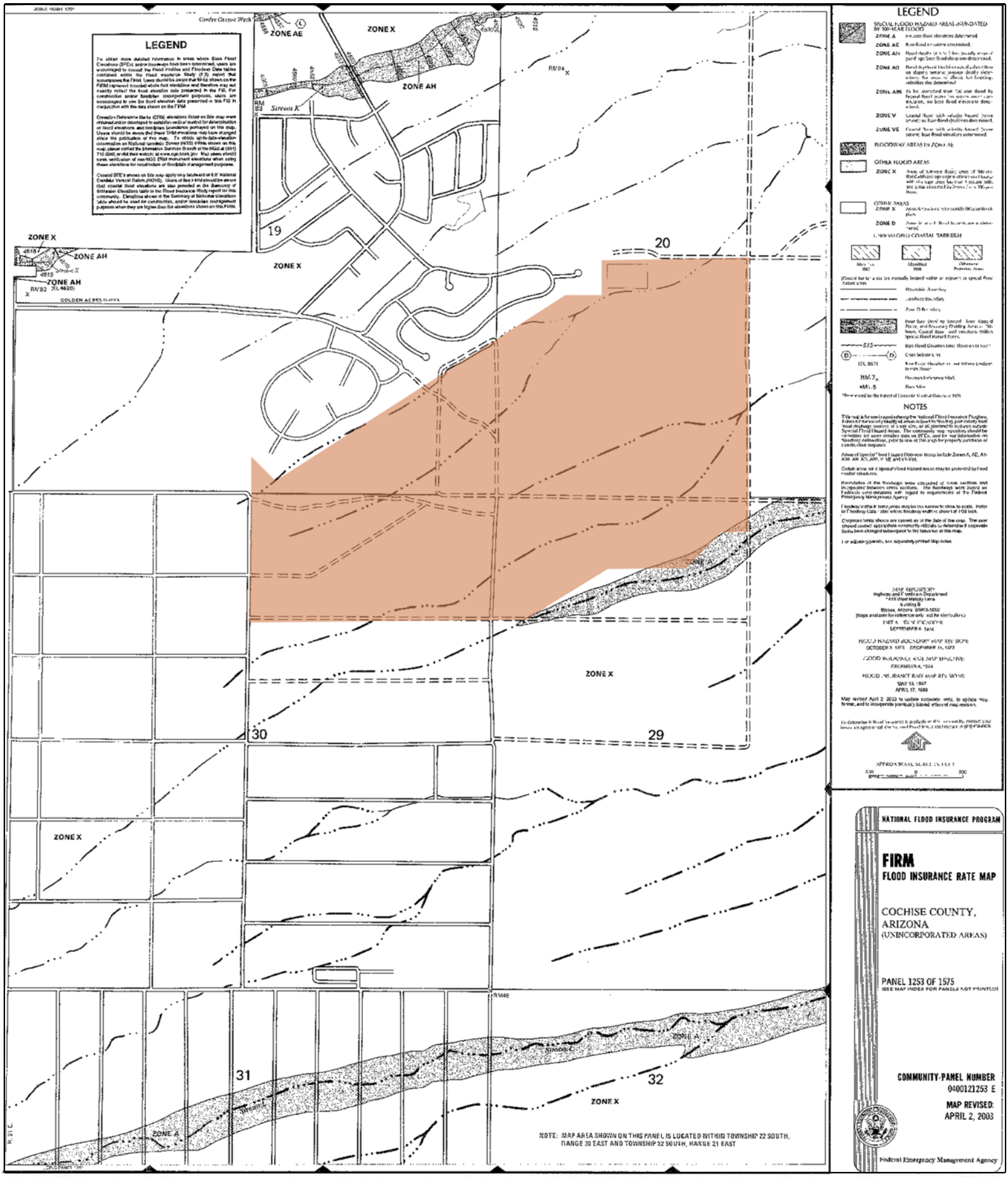


FIGURE 5: FEMA MAP

VENTANA DE FLORES SPECIFIC PLAN

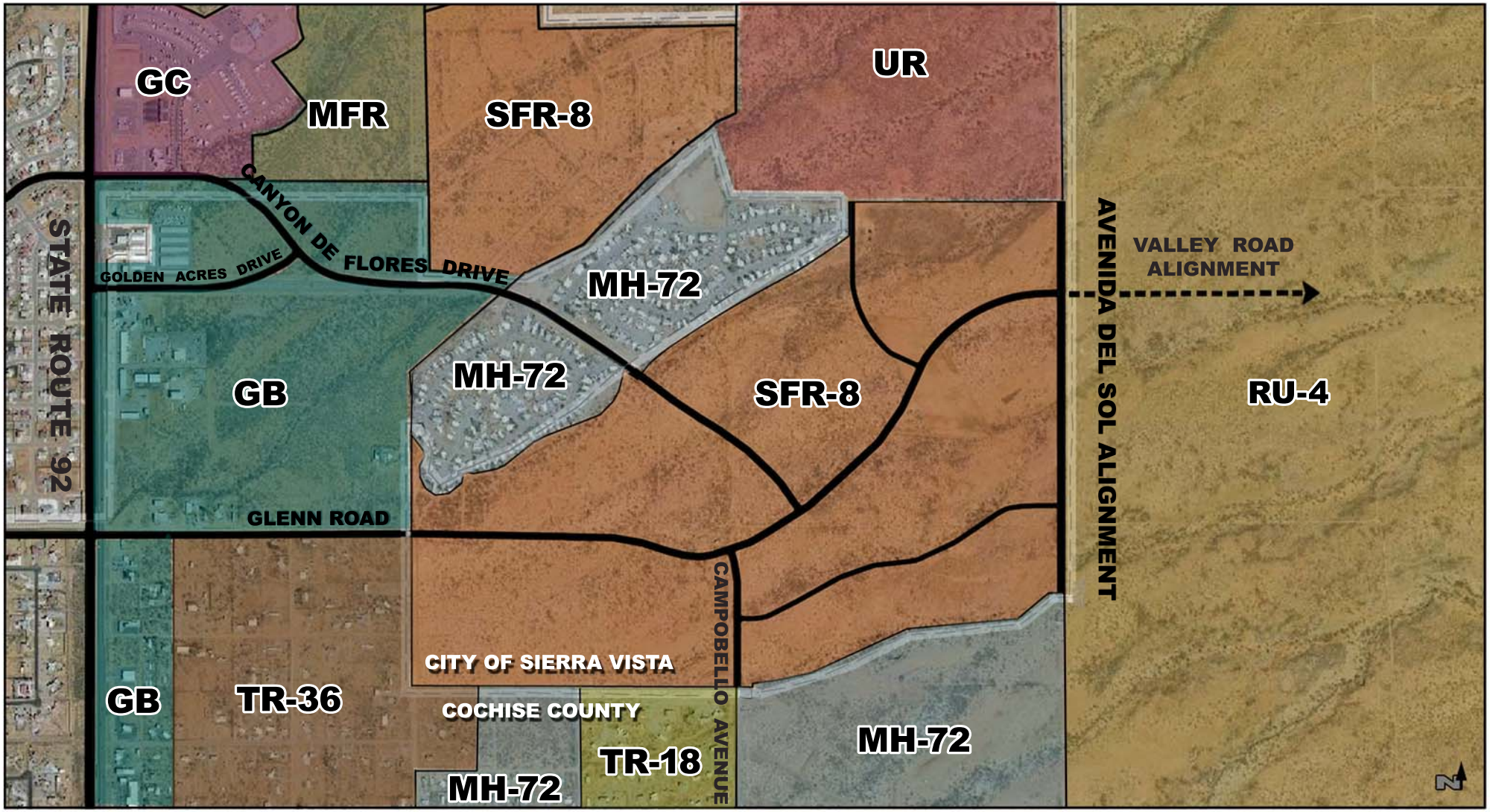


FIGURE 6: EXISTING ZONING DESIGNATIONS

CITY OF SIERRA VISTA

- SFR-8
- MFR
- UR
- GC

COCHISE COUNTY

- MH-72
- GB
- RU-4
- TR-18
- TR-36

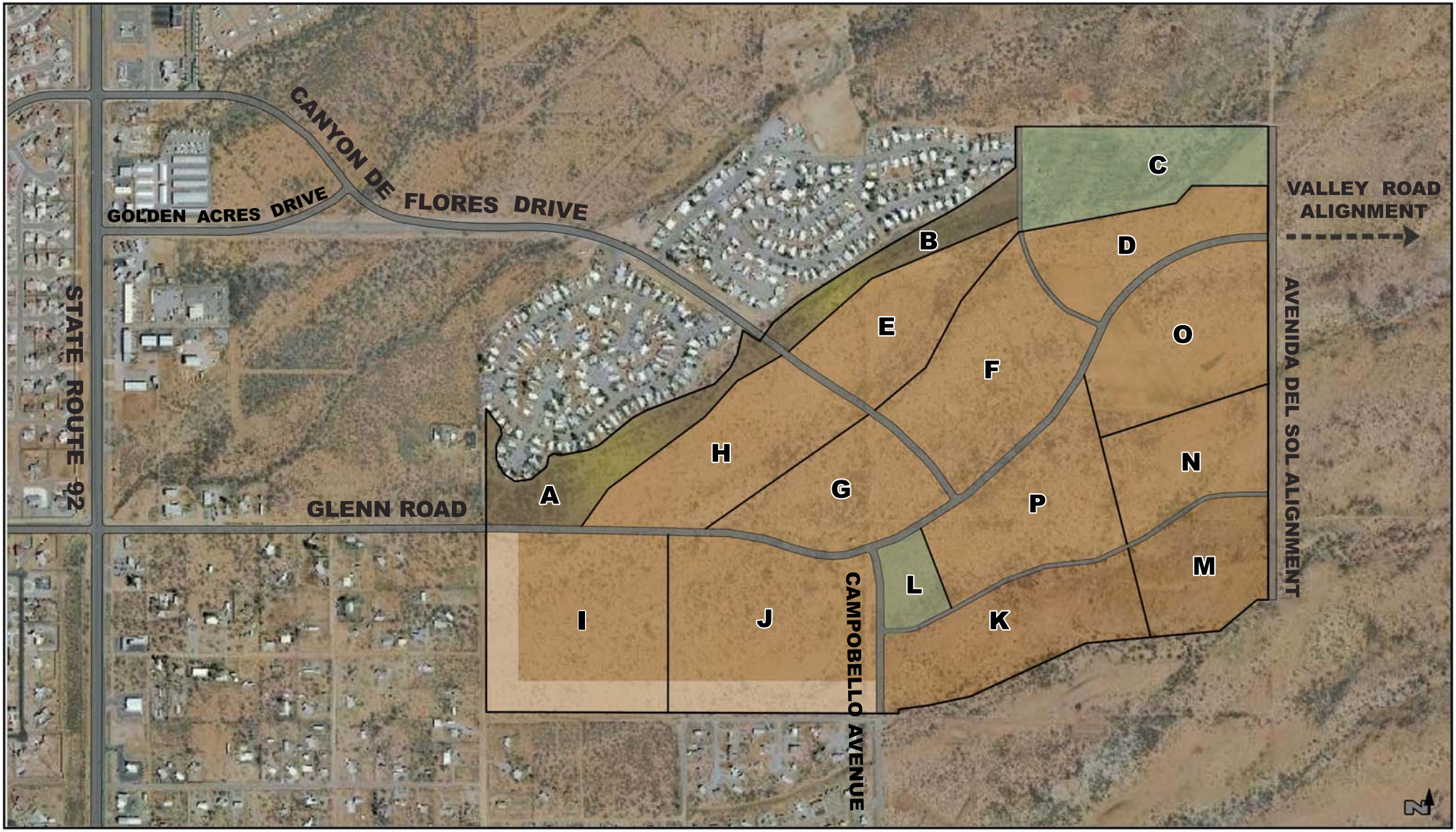


FIGURE 7: LAND USE PLAN

RESIDENTIAL

PARK

OPEN SPACE

TRANSITION BUFFER
*8,000 SQ FT LOTS REQUIRED 250 FT FROM PERIMETER
*SINGLE-STORY HOMES REQUIRED FOR FIRST TIER OF LOTS ALONG PERIMETER

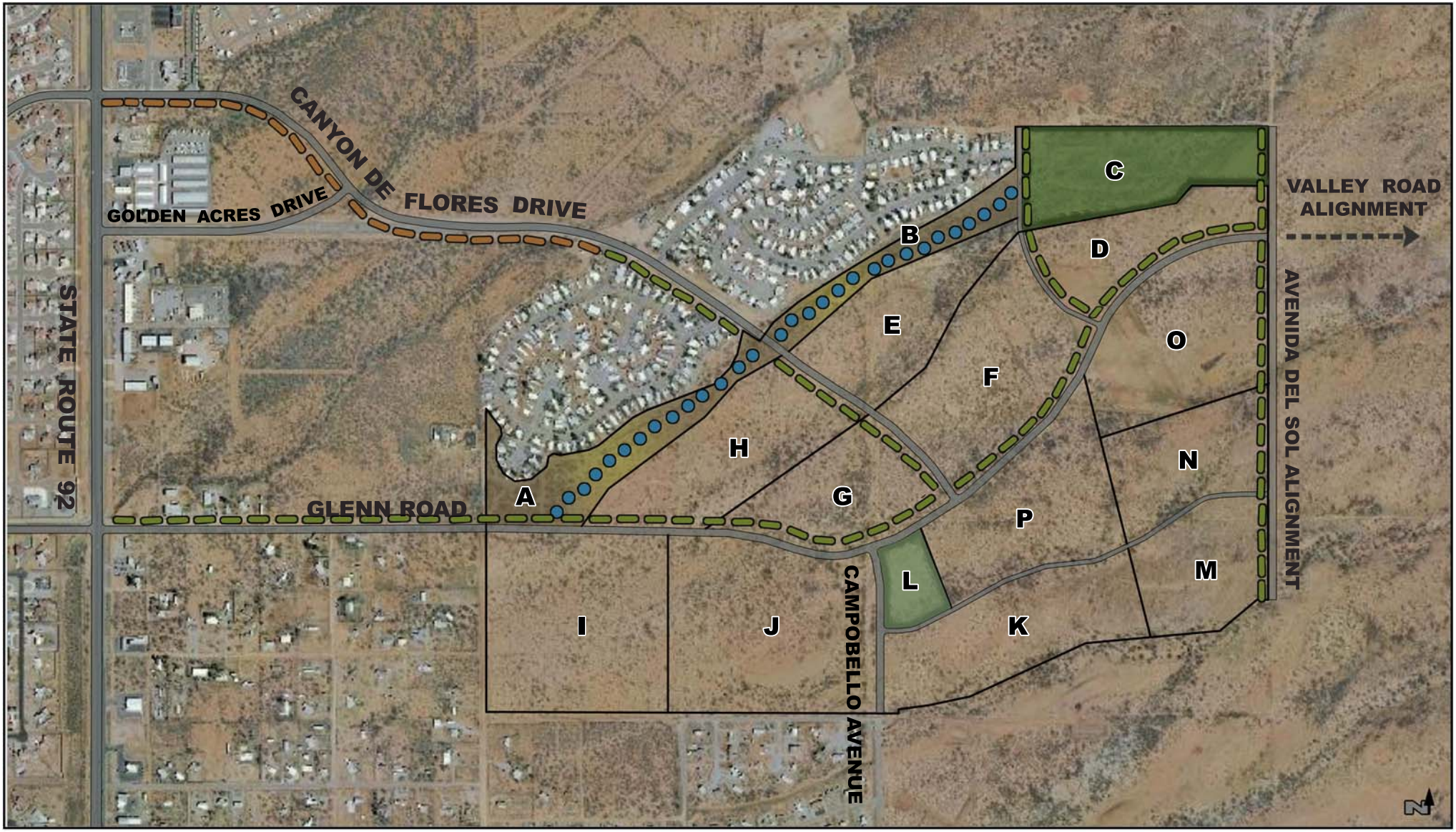


FIGURE 8: PARKS, RECREATION, AND OPEN SPACE PLAN

- PROPOSED POTENTIAL MULTI-MODAL PATH (.74 MILES)
- PROPOSED MULTI-MODAL PATH (3.10 MILES)
- FUTURE CONNECTING MULTI-MODAL PATH
- 20 ACRE PUBLIC AREA PARK (BLOCK C)
- 5 ACRE PUBLIC NEIGHBORHOOD PARK (BLOCK L)
- OPEN SPACE (BLOCKS A & B)

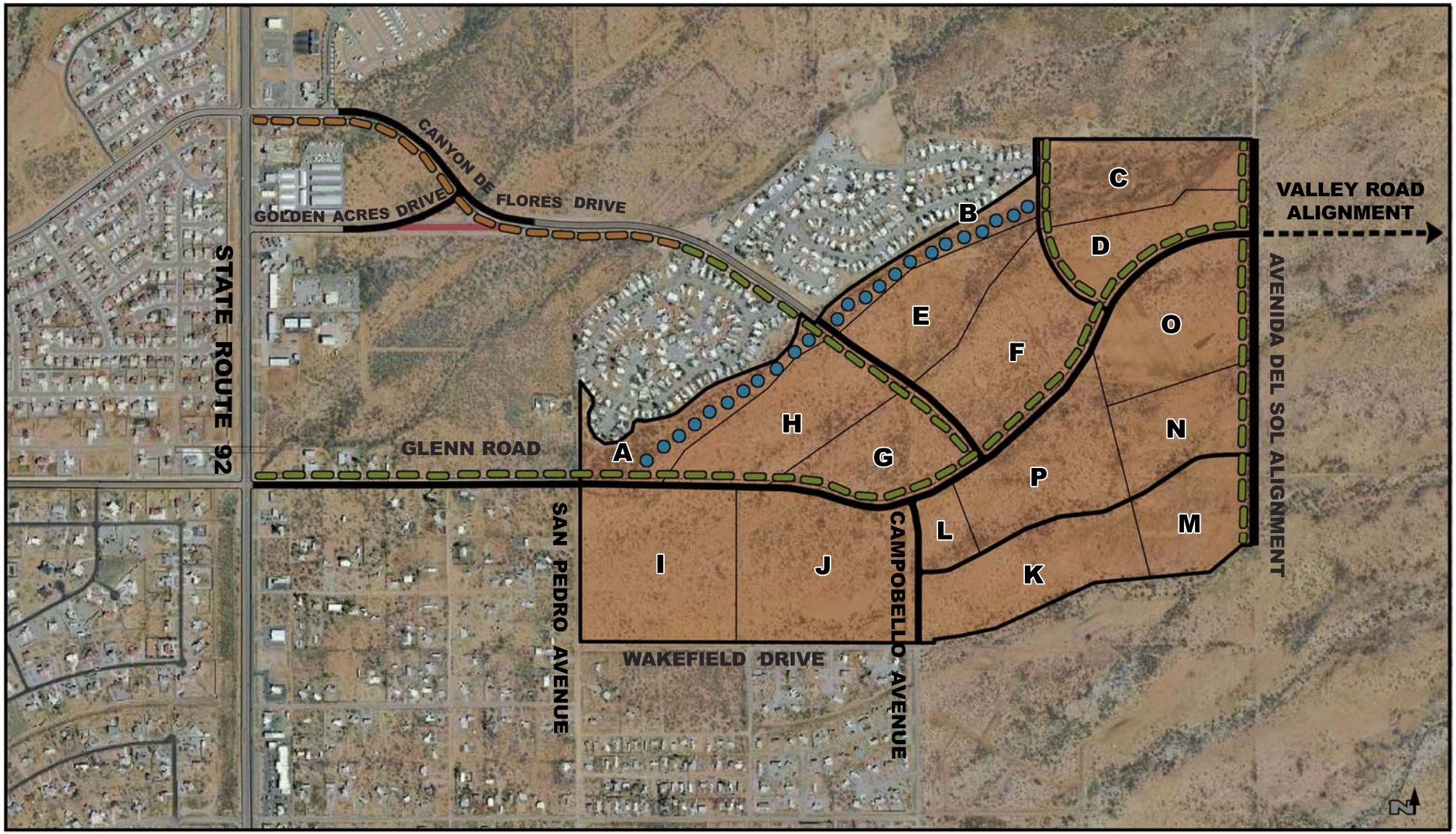


FIGURE 9: TRAFFIC AND CIRCULATION PLAN

EXISTING COLLECTOR ROADWAY

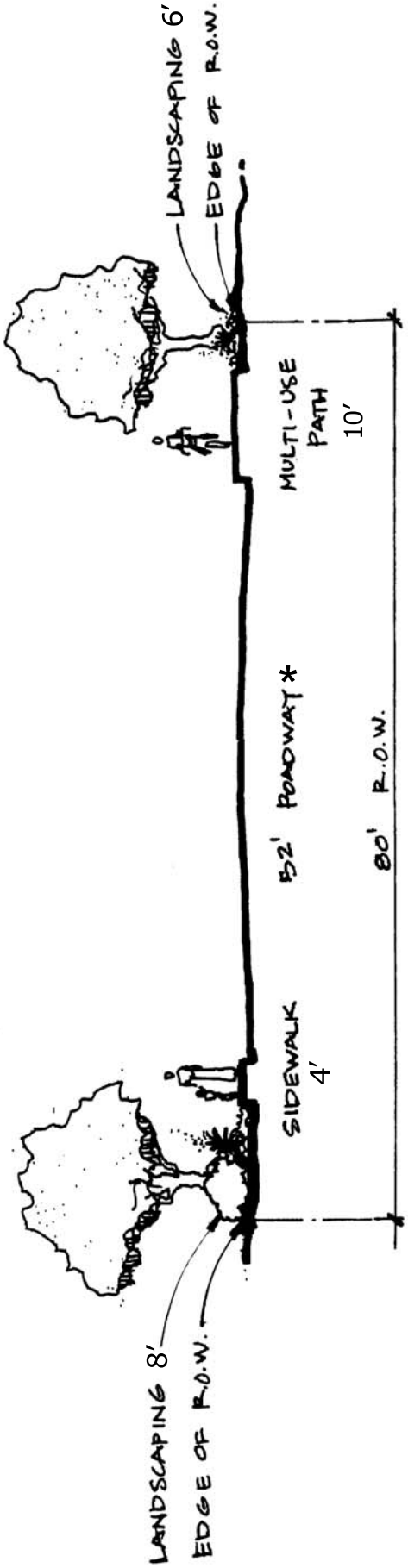
FUTURE COLLECTOR ROADWAY

FUTURE ABANDONED ROADWAY

PROPOSED POTENTIAL MULTI-MODAL PATH (.74 MILES)

PROPOSED MULTI-MODAL PATH (3.10 MILES)

FUTURE CONNECTING MULTI-MODAL PATH



*48' OF PAVEMENT, STRIPED FOUR TRAFFIC LANES
PER CITY OF SIERRA VISTA STANDARDS
WITH 2' OF CURB / GUTTER ON EACH SIDE

FIGURE 10: COLLECTOR ROAD CROSS SECTION

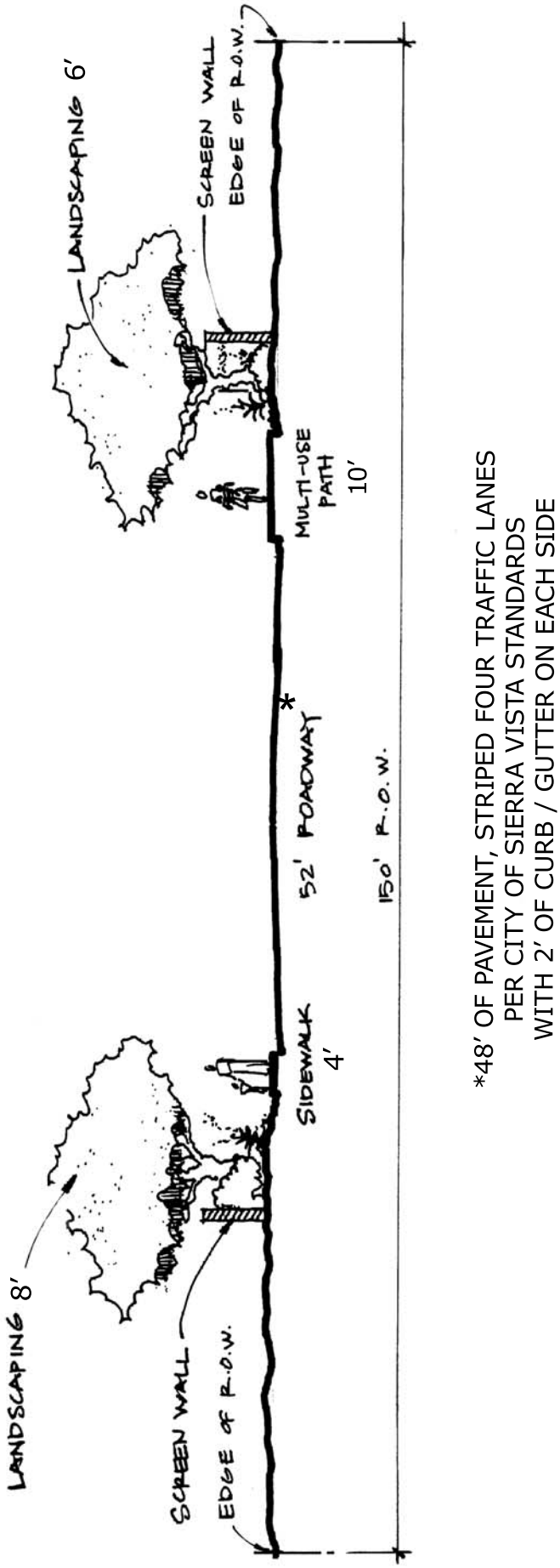


FIGURE 11: COLLECTOR ROAD CROSS SECTION IN GOLDEN ACRES MOBILE HOME PARK

FIGURE 12: GOLDEN ACRES MOBILE HOME PARK VIEW ALONG ROADWAY

FIGURE 13: POTENTIAL SAFETY IMPROVEMENTS ON CANYON DE FLORES DRIVE

BUS STOP

THREE-WAY STOP

FIGURE 14: AREA PARK CONCEPT PLAN

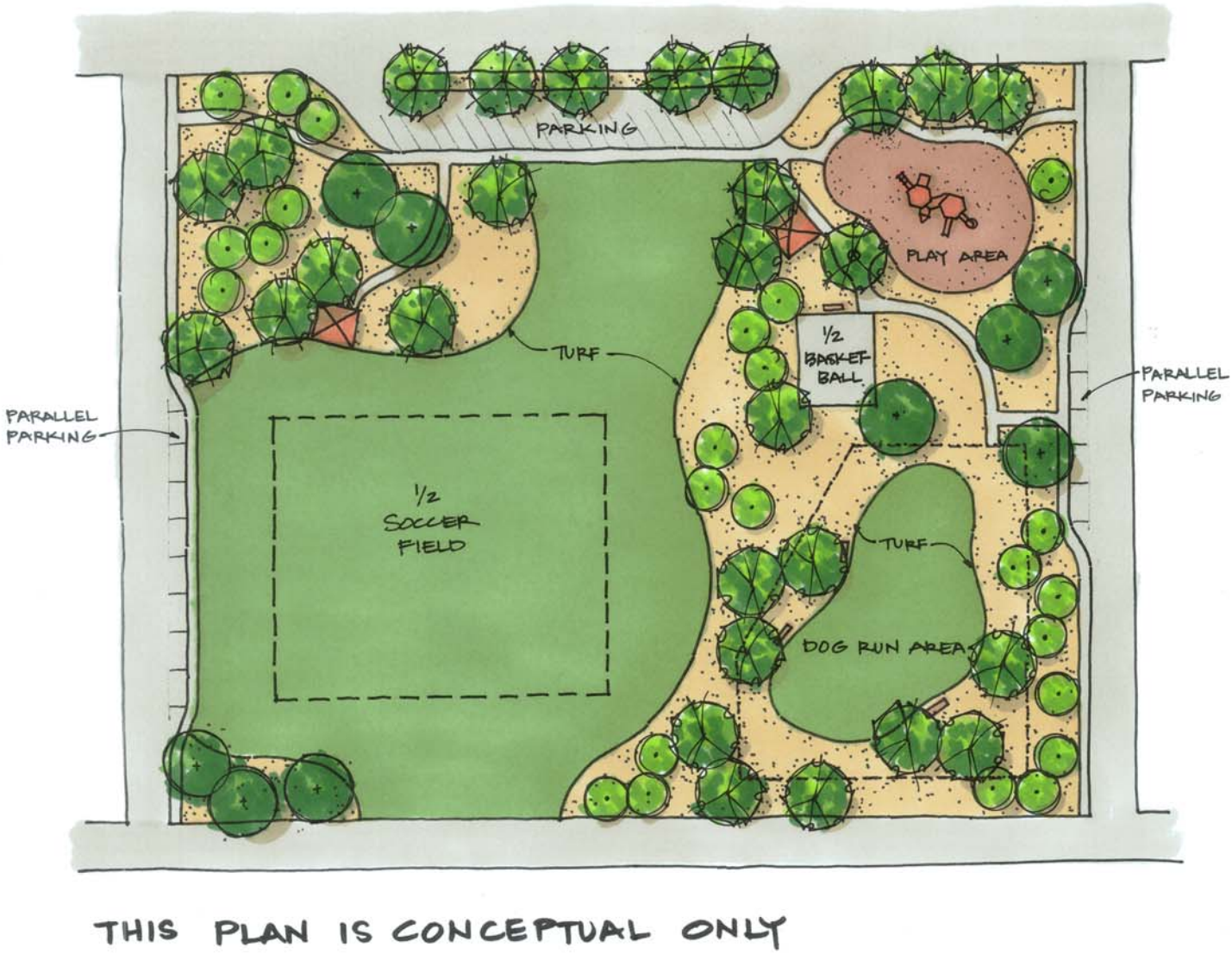


FIGURE 15: NEIGHBORHOOD PARK CONCEPT PLAN

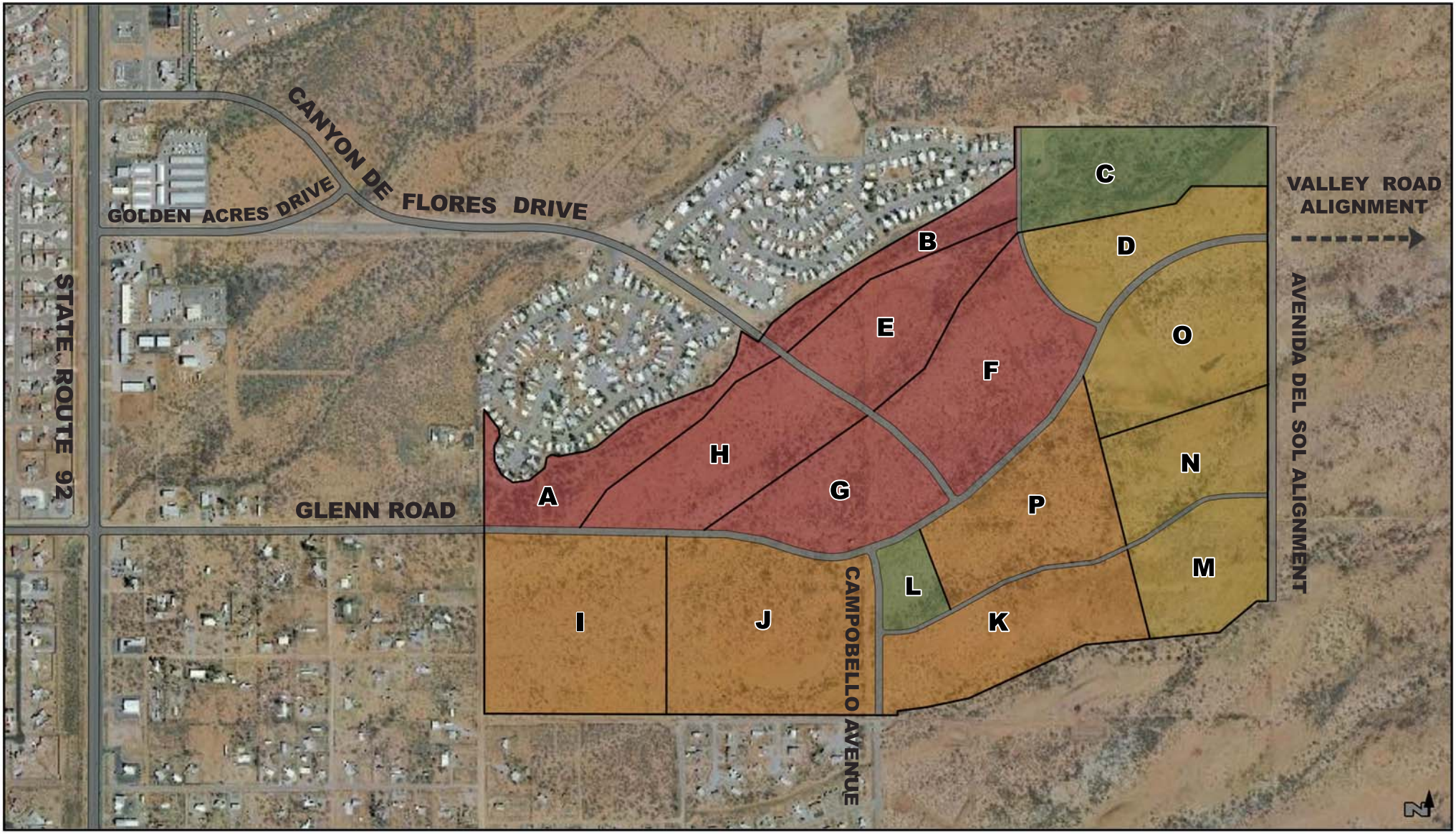


FIGURE 16: PHASING PLAN

VILLAGE A
VILLAGE B
VILLAGE C
PARK SITES

NOTES

A) This parcel surveyed in accordance with Pioneer Title Agency Inc. Commitment for Title Insurance Order No. 00725990 dated November 10, 2005 at 07:30 A.M., and is subject to the following:

1. Reservations contained in the Patent from the United States of America, recorded in Book 68, Deeds of Real Estate, page 277 (Affects Section 29 and 30) recorded in Book 69, Deeds of Real Estate, page 102 (Affects Section 19 and 20), reading as follows:
   Subject to any vested and accrued water rights for mining, agricultural, manufacturing or other purposes, and rights to ditches and reservoirs used in connection with such water rights as may be recognized and acknowledged by the local customs, laws and decisions of courts; and there is reserved from the lands hereby granted, a right of way thereon for ditches or canals constructed by the authority of the Untied States of America.

2. Water Rights, claims or titles to water, and agreements, covenants, conditions or rights incident thereto, whether or not shown by the public records.
   This exception is not limited by reason of the disclosure of any matter relating to Water Rights as may be set forth elsewhere in Schedule B.

3. Liabilities and Obligations imposed upon said land by reason of its inclusion with the following named district:

   Fry Fire District

4. Taxes and assessments collectible by the County Treasurer a lien payable, but not yet due for the following year:

   Year : 2nd half 2005

5. Easements and rights incident thereto, as set forth in instrument:

   Recorded in Book. : 54, Miscellaneous Records
   Page: 13
   Purpose: telephone and telegraph (Affects Section 30)

6. The right of entry to prospect for, mine and remove an undivided half interest in and to all oil, gas and other mineral rights in said land, as implied by the reservation of same in instrument:

   Recorded in Docket: 256
   Page: 599

7. Not included

8. Easements and rights incident thereto, as set forth in instrument:

   Recorded in Docket: 737
   Page: 492
   Purpose: power, telephone, gas, water and other utilities (Affects the Southeast One-Quarter of Section 19)

9. Easements and rights incident thereto, as set forth in instrument:

   Recorded in Docket: 770
   Page: 194
   Purpose: communication and other facilities (Affects Section 19)

10. Easements and rights incident thereto, as set forth in instrument:

    Recorded in Docket: 925
    Page: 326
    Purpose: electric line or system (Affects Section 30)

11. Easements and rights incident thereto, as set forth in instrument:

    Recorded in Docket: 1591
    Page: 372
    Purpose: ingress, egress and utilities (Affects Section 19 and 30)

12. Any action that may be taken by the County of Cochise to acquire right-of-way for County Highway as disclosed by Maps, recorded in Book 11 of Maps, page 68, in Document No. 0409-30694.

13. Rights of Lessees under unrecorded leases.

OWNER'S PARCEL

Parcel I:

(Parcel A)
That portion of the North One-Half (N 1/2) of the Northwest One-Quarter (NW 1/4) of Section 29, Township 22 South, Range 21 East of the Gila and Salt River Base and Meridian, Cochise County, Arizona, described as follows:

BEGINNING at the Northwest corner of said Section 29;

THENCE N 89°58'15" E, along the North Line of said Northwest One-Quarter (NW 1/4), a distance of 2,570.22 feet to a line 75.00 feet Westerly of and parallel with the East Line of said Northwest One-Quarter (NW 1/4);

THENCE S 00°00'57" E, along said parallel line, a distance of 542.74 feet;

THENCE S 50°00'00" W, 326.95 feet;

THENCE S 84°45'00" W, 910.00 feet;

THENCE S 65°15'00" W, 860.00 feet;

THENCE S 78°00'00" W, 290.00 feet;

THENCE S 82°30'00" W, 200.01 feet to a line 40.00 feet North of and parallel with the South Line of said North One-Half (N 1/2) of Northwest One-Quarter (NW 1/4);

THENCE S 89°58'43" W, along said parallel line, a distance of 149.70 feet to a line 40.00 feet North of and parallel with the South Line of the North One-Half (N 1/2) of the Northeast One-Quarter (NE 1/4) of Section 30, Township 22 South, Range 21 East of the Gila and Salt River Base and Meridian, Cochise County, Arizona;

THENCE N 89°50'31" W, along said parallel line, a distance of 0.08 feet with West Line of said Northwest One-Quarter (NW 1/4);

THENCE N 00°02'39" W, along said West Line, a distance of 1,281.36 feet to the POINT OF BEGINNING;

TOGETHER WITH:

(Parcel B)
The North One-Half (N 1/2) of the Northeast One-Quarter (NE 1/4) of Section 30, Township 22 South, Range 21 East of the Gila and Salt River Base and Meridian, Cochise County, Arizona;

EXCEPT from the North One-Half (N 1/2) of the Northeast One-Quarter (NE 1/4) of Section 30, the following described parcels (a) and (b)

(a) The South 40.00 feet of said North One-Half (N 1/2) of the Northeast One-Quarter (NE 1/4);
(b) The North 145.00 feet of the East 187.00 feet of the Northeast

EXCEPT the North 64.00 feet thereof;

EXCEPT the East 62.00 feet thereof.

(Parcel C)
That portion of the Southwest One-Quarter (SW 1/4) of Section 20, Township 22 South, Range 21 East of the Gila and Salt River Base and Meridian, Cochise County, Arizona, bounded as follows:

On the West by the West Line of said Southwest One-Quarter (SW 1/4);

On the North by the South line of GOLDEN ACRES MOBILE HOME PARK UNIT 2, as recorded in Book 9 of Maps and Plats, Page 22, records of Cochise County, Arizona;

On the East by a line 1,709.14 feet West of and parallel with the East Line of said Southwest One-Quarter (SW 1/4);

On the South by the South Line of said Southwest One-Quarter (SW 1/4);

TOGETHER WITH:

(Parcel D)
That portion of the Southeast One-Quarter (SE 1/4) of Section 19, Township 22 South, Range 21 East of the Gila and Salt River Base and Meridian, Cochise County, Arizona, bounded as follows;

On the West by the West Line of said Southeast One-Quarter (SE 1/4);

On the North by the South Line of GOLDEN ACRES MOBILE HOME PARK UNIT 2, as recorded in Book 7 of Maps and Plats, Page 15, records of Cochise County, Arizona, and the South Line of GOLDEN ACRES MOBILE HOME PARK UNIT 2, as recorded in Book 9 of Maps and Plats, Page 22, records of Cochise County, Arizona;

On the East by the East line of said Southeast One-Quarter (SE 1/4);

On the South by the South Line of said Southeast One-Quarter (SE 1/4);

EXCEPT from all of Parcel I an undivided ½ interest into all oil, gas and other minerals as recorded in Docket 256, Page 599, records of Cochise County, Arizona.

Parcel II:

That portion of the Southwest One-Quarter (SW 1/4) of Section 20, Township 22 South, Range 21 East of the Gila and Salt River Base and Meridian, Cochise County, Arizona, described as follows:

COMMENCING at the Northwest corner of said Southwest One-Quarter (SW 1/4);

THENCE N 89°55'52" E, along the North Line of said Southwest One-Quarter (SW 1/4), a distance of 936.01 feet to the POINT OF BEGINNING at the Northeast corner of GOLDEN ACRES MOBILE HOME PARK UNIT 2, as recorded in Book 9 of Maps and Plats, Page 22, records of Cochise County, Arizona;

THENCE continue N 89°55'52" E, along said North Line, a distance of 1,634.18 feet to a line,75.00 feet West of and parallel with the East Line of said Southwest One-Quarter (SW 1/4);

THENCE S 00°02'34" E, along said parallel line, a distance of 2,645.86 feet to the South Line of said Southwest One-Quarter (SW 1/4);

THENCE S 89°58'15" W, along said South Line, a distance of 1,634.14 feet to a line 1,709.14 feet Westerly of and parallel with said East Line of Southwest One-Quarter (SW 1/4);

THENCE N 00°02'34" W, along said parallel line, a distance of 2,159.88 feet to the Southeast corner of said GOLDEN ACRES MOBILE HOME PARK UNIT 2;

THENCE N 00°02'52" W, along the East Line of said GOLDEN ACRES MOBILE HOME PARK UNIT 2, a distance of 484.58 feet to the POINT OF BEGINNING;

EXCEPT an undivided ½ interest into all oil, gas and other minerals as reserved in Deed recorded in Docket 256, Page 599, records of Cochise County, Arizona.

B) BASIS OF BEARINGS: THE WEST LINE OF THE NORTHEAST QUARTER OF SECTION 19, ACCORDING TO A RECORD OF SURVEY BY BRUCE SMALL, RSL 12122, RECORDED IN THE OFFICE OF RECORDER, COCHISE COUNTY ARIZONA IN RECORD OF SURVEY BOOK 24, PAGE 64. BEARING BEING N 00°03'19" W.

C) BASIS OF ELEVATION: CITY OF SIERRA VISTA "POINT 75" (NW COR SEC 19) ACCORDING TO SECTION MAP. ELEVATION BEING 4599.90 (NGVD 29)

D) TOTAL AREA = 335.273± ACRES.

E) REFERENCES:

LEGEND

- BOUNDARY LINE
- SECTION LINE
- FENCE LINE
- SET 1/2" IRON PIN "RLS 14145" AT ALL CORNERS OF PARCEL SURVEYED, UNLESS NOTED
- FOUND SURVEY MONUMENT – AS NOTED
- WATER VALVE
- SIGN
- SEWER MANHOLE
- TEE POST
- SRP
- UTILITY POLE
- TELEPHONE PEDESTAL
- GAS MARKER
- ELECTRICAL RISER
- PARCEL I-B — DENOTES PARCEL FROM TITLE REPORT

LINE TABLE

LINE	BEARING	DISTANCE
L1	S 37°01'46" E	151.24
L2	S 08°04'51" E	48.83
L3	S 28°21'02" W	78.54
L4	S 01°12'45" E	98.84
L5	S 26°30'43" E	101.65
L6	S 55°30'58" E	95.13
L7	N 82°39'49" E	111.44
L8	N 51°20'33" E	134.53
L9	N 11°09'56" E	69.86
L10	N 56°09'56" E	35.36
L11	S 78°50'04" E	53.05
L12	N 79°21'27" E	192.89
L13	N 65°19'56" E	73.32
L14	N 62°18'56" E	107.09
L15	N 68°54'36" E	243.81
L16	N 44°14'07" E	155.09
L17	N 27°22'56" E	104.44
L18	N 13°57'27" E	101.12
L19	N 72°18'18" E	125.72
L20	N 48°12'53" E	168.09
L21	S 56°35'34" E	95.50
L22	N 33°24'26" E	75.03
L23	N 33°19'15" E	75.02
L24	N 52°59'19" E	203.17
L25	N 10°37'38" E	128.81
L26	N 59°16'25" E	19.82
L27	S 72°04'49" E	34.90
L28	N 88°31'36" E	151.73
L29	N 68°28'33" E	152.93
L30	N 52°57'36" E	59.01
L31	N 59°26'30" E	22.60
L32	N 75°41'42" E	40.72
L33	N 73°11'24" E	194.28
L34	S 82°30'00" W	200.01
L35	S 89°58'43" W	149.70
L36	S 89°47'49" E	125.00
L37	S 00°02'39" E	81.00
L38	N 89°47'49" W	125.00
L39	N 00°02'39" W	81.00

CURVE TABLE

CURVE	ARC	DELTA	RADIUS
C1	244.91	18°49'17"	745.54
C2	70.08	05°21'26"	749.54

SURVEYOR'S CERTIFICATE

To : POINEER TITLE AGENCY
This is to certify that this map or plat and the survey on which it is based were made in accordance with "Minimum Standard Detail Requirements for ALTA/ACSM Land Title Surveys," jointly established and adopted by ALTA, ACSM and NSPS in 1999, and includes items 1,4,5 of Table A thereof. Pursuant to the Accuracy Standards as adopted by ALTA, NSPS, AND ACSM and in effect on the date of this certification, undersigned further that proper field procedures, instrumentation, and adequate survey personnel were employed in order to achieve results comparable to those outlined in the "Minimum Angle, Distance, and Closure Requirements for Survey Measurements Which Control Land Boundaries for ALTA/ACSM Land Title Surveys."

Two working days before you dig CALL FOR THE BLUE STAKES 263-1100 1-800-STAKE-IT (OUTSIDE MARICOPA COUNTY)

EEC 205034

REV.	DATE	DESCRIPTION	CK. BY

A PORTION OF SECTIONS 19, 20, 29, 30,
T-22-S, R-21-E, G.& S.R.M.
COCHISE COUNTY, ARIZONA

SHEET TITLE: ALTA/ACSM LAND TITLE SURVEY

PROJECT TITLE: SIERRA VISTA

eec Engineering and Environmental Consultants, Inc.
4625 E. FT. LOWELL RD.
TUCSON, ARIZONA 85712 520-321-4625

REGISTERED LAND SURVEYOR CERTIFICATE NO. 14145 JAMES L. DEAN DATE SIGNED ARIZONA U.S.A.

DESIGN BY:	JLD
DRAWN BY:	AD
CHK'D BY:	JLD
DATE:	12/13/05
SCALE:	Hor. 1"=20' Vert.
DRAWING NO.	1 of 4

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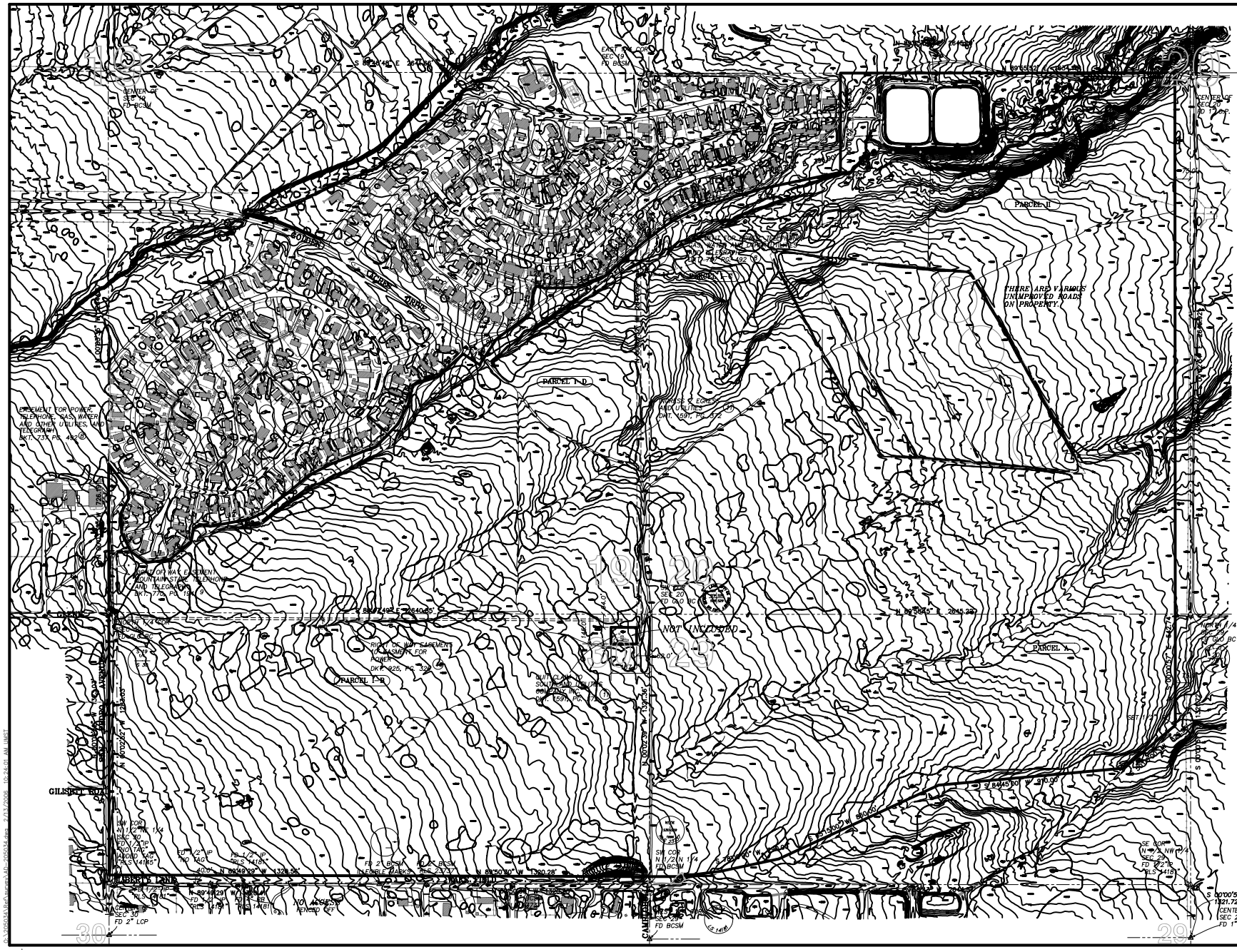

REV.	DATE	DESCRIPTION	BY

A PORTION OF SECTIONS 19, 20, 29, 30,
T-22-S, R-21-E, G.& S.R.M.
COCHISE COUNTY, ARIZONA

SHEET TITLE
ALTA/ACSM LAND TITLE SURVEY

PROJECT TITLE
SIERRA VISTA

eec
Engineering and Environmental Consultants, Inc.
4635 E. VT. LOWELL RD.
TUCSON, ARIZONA 85712 520-321-4625

REGISTERED LAND SURVEYOR
CERTIFICATE NO. 14145
JAMES L. DEAN
Date Signed 12/13/05
ARIZONA, U.S.A.

For notice two before you dig CALL FOR BLUE STAKE
263-1100
1-800-STAKE-I
(OUTSIDE MARICOPA COUNTY)

DESIGN BY:	JLD
DRAWN BY:	AD
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DATE:	12/13/05
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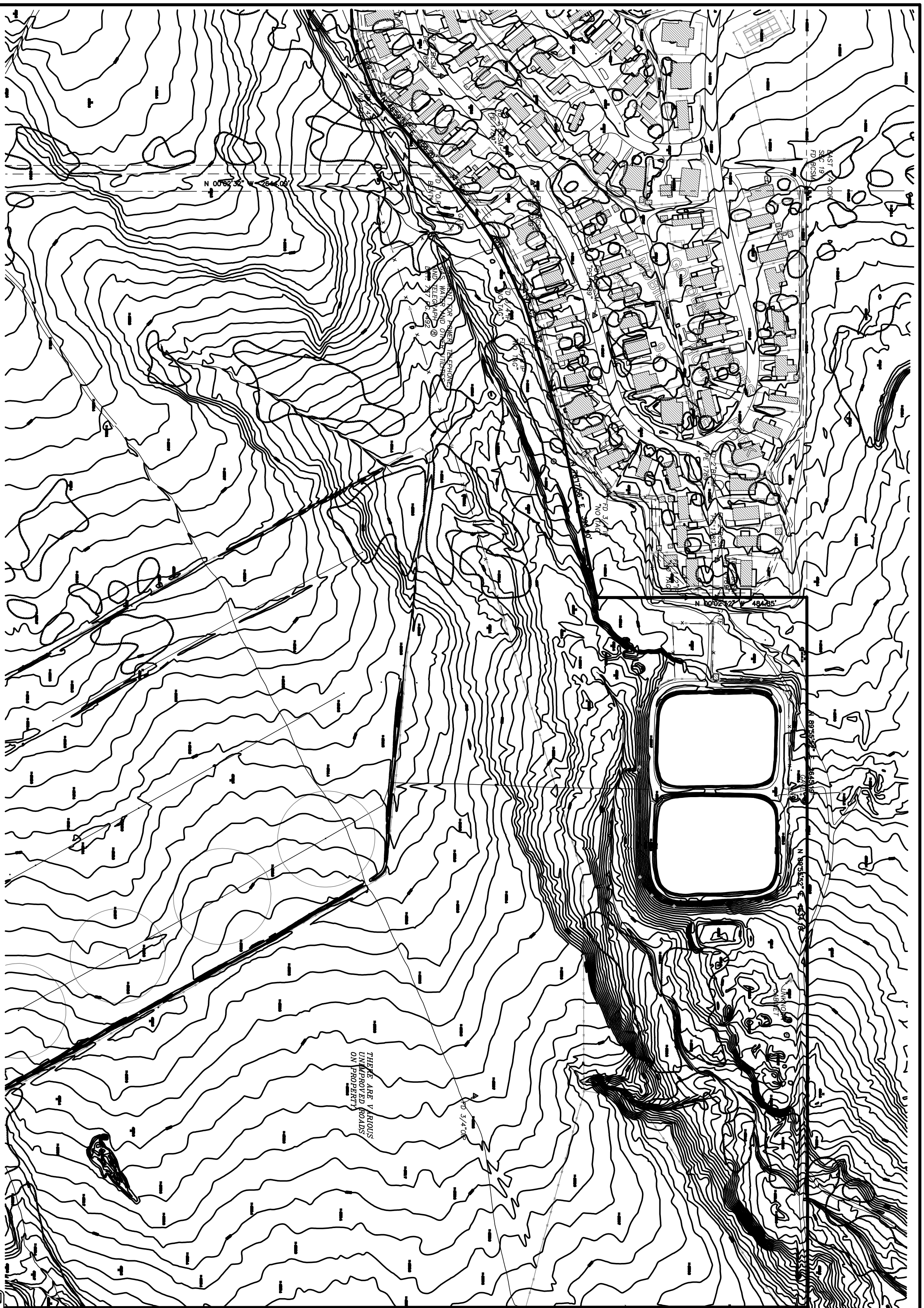

SCALE: 1"=100'

263-1100
1-800-STAKE-IT
(OUTSIDE MARICOPA COUNTY)

EEC 205034

DESIGN BY:	JLD
DRAWN BY:	AD
CHK'D BY:	JLD
DATE:	12/13/05
SCALE:	Hor. 1"=100' Vert.
DRAWING NO.	3 of 4

REGISTERED LAND SURVEYOR — 14145 JAMES L. DEAN — ARIZONA, U.S.A.

eec
Engineering and Environmental Consultants, Inc.
4625 E. FT. LOWELL RD.
TUCSON, ARIZONA 85712 520-321-4625

SHEET TITLE
ALTA/ACSM LAND TITLE SURVEY

PROJECT TITLE
SIERRA VISTA

A PORTION OF SECTION 20, 19,
T-22-S, R-21-E, G.& S.R.M.
COCHISE COUNTY, ARIZONA

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SCALE: 1"=100'

EEC 205034

Call Before You Dig
263-1100
1-800-STAKE-IT
(OUTSIDE MARICOPA COUNTY)

DESIGN BY:	JLD
DRAWN BY:	AD
CHK'D BY:	JLD
DATE:	12/13/05
SCALE:	Hor.: 1"=100' Vert.:
DRAWING NO.	4 of 4

REGISTERED LAND SURVEYOR
JAMES L. DOUGLAS
No. 13101
ARIZONA U.S.A.

eec
Engineering and Environmental Consultants, Inc.
4625 E. FT. LOWELL RD.
TUCSON, ARIZONA 85712 520-321-4625

SHEET TITLE
ALTA/ACSM LAND TITLE SURVEY

PROJECT TITLE
SIERRA VISTA

A PORTION OF SECTION 19,
T-22-S, R-21-E, G.& S.R.M.
COCHISE COUNTY, ARIZONA

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APPENDICES

A. City of Sierra Vista Plant List

B. Legal Description

C. Hydrologic and Hydraulic Report

D. Jurisdictional Delineation

E. Vegetation and Sensitive Species Report

F. Traffic Report

APPENDIX A:
City of Sierra Vista Plant List

Recommended Plants for Sierra Vista by the UA Cooperative Extension Water Wise Program

N=Cochise County Native Species, **T**=Tree, **S**=Shrub, **V**=Vine, **C**=Cactus, **Gc**=Groundcover, **Sc**=Succulent, **E**=Evergreen, **SE**=Semi-evergreen, **D**=Deciduous
FS = Full Sun, **Psh** = Partial Shade, **FR =** Flame Resistant, **FL =** Flammable, ***** = Toxic, **M** = Not cold hardy in our area, **spp.** = Species
Supplemental **Watering** Frequency: **1** = None, **2** = Little, **3** = Moderate (every 2 to 3 weeks) **Refer to Watering Guidelines in introductory comments**

Common Name	Scientific Name	Mature Size	Watering Frequency	Remarks
Trees				
Afghan Pine	*Pinus eldarica*	30-80'H 15-25'W	2	FS - E - FL - - One of best pines for desert
Argentine/Chilean Mesquite	*Prosopis alba or chilensis*	20 - 40' H & W	2 - 3	FS - SE or Evergreen mild climates -Thornless forms available
Arizona Ash	*Fraxinus velutina 'Rio Grande'*	30'H 30-40'W	3	FS - N - D - FR - 'Rio Grande', Fan-tex ash is the recommended ash for this area - Thrives in hot, dry climates and alkaline soils - Foliage resistant to wind burn
Arizona Cypress	*Cupressus arizonica*	40'H 20'W	2 - 3	FS - N - E - FL - Can be used as a windbreak
Arizona Walnut	*Juglans major*	50' H & W	3	FS - D - N - Edible nuts have a rich flavor
Blackbrush Acacia	*Acacia rigidula*	10-15' H&W	1 - 2	FS - SE - T or S - Fragrant, pale yellow flowers almost glow on a bright spring day - To train to a single stalk, trim off suckers at base
Blue Elderberry	*Sambucus mexicana*	10-30'H 8-20'W	3	FS - Psh - N - E - T or S - Drops its foliage during drought
Blue Palo Verde	*Cercidium floridum*	35'H 30'W	2 - 3	FS - D - Prune only to enhance form - Do not prune in summer
Bottlebrush	*Callistemon citrinus*	10-15' H&W	3	FS - E - T or S - M - Bruised leaves smell lemony
Buckeye Oak	*Quercus buckleyi*	35' H & W	2 - 3	FS - D - T or S - M - Trunk branches almost from base
Butterfly-leaf Acacia	*Acacia crassifolia*	10-15'H & W	2 - 3	FS - Psh - E - Leaves butterfly-winged shaped
Canyon Live Oak	*Quercus chrysolepis*	20-60' H&W	2 - 3	FS - E - Handsome round-headed or somewhat spreading tree with smooth whitish bark
Catclaw Acacia	*Acacia greggii*	15-25'H 15'W	1 - 2	FS - N - D - Thorns - Shrubby in drought, treelike with water
Chaste Tree	*Vitex agnus-castus*	25' H&W	2 - 3	FS - D - T or S - Leaves aromatic - Blooms summer to fall - Avail. with white, blue or pink flowers
Chinese Pistache	*Pistacia chinensis*	30-60' H & W	2 - 3	FS - D - FR - Reliable tree for streetside planting, lawn, patio, or garden - Good fall color
Chinquapin Oak	*Quercus muehlenbergii*	40-50'H 50-60'W	2 - 3	FS - D - Leaves turn orange and bronze in fall - Acorns edible
Chitalpa	*Chitalpa tashkentensis*	20-30' H&W	2 - 3	FS - D - Rapid grower - Flowers spring to fall - Chitalpa is a cross between Catalpa and Desert Willow - Susceptible to leaf spot, but won't harm tree
Common Hackberry	*Celtis occidentalis*	50' H&W	3	FS - Psh - D - Resistant to oak root fungus - Tree does not heave sidewalks - Good choice for street or lawn tree
Cork Oak	*Quercus suber*	30-60' H&W	2 - 3	FS - E - Handsome thick corky bark
Crape Myrtle	*Lagerstroemia spp.*	See remarks	3	FS - D - T or S - FR - All crape myrtles hardy for our zone except L. speciosa (Giant crape myrtle) - Check with nursery for sizes and colors
Deodar Cedar	*Cedrus deodora*	80'H 40'W	3	FS - E - FL - Many varieties available
Desert Museum Palo Verde	*Cercidium Desert Museum*	20 ' H & W	2 - 3	FS - D - Hybrid - Clean, thornless and few seedpods and litter - Prune only to enhance form - Don't prune in summer
Desert Olive	*Forestiera neomexicana*	12-18'H 12'W	2 - 3	FS - D -T or S - FR - Fairly fast grower - Can be trained to be a small multi-trunked tree
Desert Willow	*Chilopsis linearis*	15-30'H10-20'W	2 - 3	FS - N - D - T or S - FR - Flowers spring to fall, producing trumpet-shaped blossoms that attract hummingbirds - Sterile varieties not messy - Usually multi-trunked
Emory Oak	*Quercus emoryi*	50'H 40'W	2	FS - N - S E - Hollylike leaves - Tolerates a variety of soils - May shed leaves in spring
Eucalyptus	*Eucalyptus spp.*	See remarks	1 - 2	FS - E - T or S - FL - Check with nursery for hardiness and size - Prolonged freezes can kill even large trees - Susceptible to eucalyptus redgum lerp psyllid
Gambel Oak	*Quercus gambelii*	15-30'H 15'W	2 - 3	FS - N - D - T or S - Foliage turns yellow-red or orange in fall
Golden Ball Lead Tree	*Leucaena retusa*	12-20' H & W	2 - 3	FS - E in mild winters, D otherwise - T or S - Useful between cultivated garden and native desert - Best if planted in wind sheltered area

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Common Name	Scientific Name	Mature Size	Watering Frequency	Remarks
Goldenrain Tree	*Koelreuteria paniculata*	20 H & W	3	FS - D - Can be gawky without pruning
Guajillo	*Acacia berlandieri*	5-12'H 5-20'W	1 - 2	FS - E - FL - M - Thornless forms available
Holly Oak	*Quercus ilex*	30-60' H & W	2 - 3	FS - E - Growth can be fairly fast, but varies with soil and water conditions
Honey Mesquite	*Prosopis glandulosa*	30' H & W	2	FS - D - Little pruning needed - Often multi-trunked - Thorniness variable - Cutting grown 'Maverick' is a superior thornless form
Italian Cypress	*Cupressus sempervirens*	60H 10'W	2 - 3	FS - E - FL - Several varieties available
Italian Stone Pine	*Pinus pinea*	40-80'H 40-60'W	2 - 3	FS - E - FL - M - Eventually too large for small gardens
Juniper	*Juniperus spp.*	See remarks	2	FS - Psh - E - Some N - FL - Check with nursery for size, water requirements & hardiness - When junipers fail, it's usually from too much moisture
Little-leaf Ash	*Fraxinus greggii*	25'H 20'W	2	FS -SE - May be multi-trunked - Good size ash for small yards
Littleleaf Palo Verde	*Cercidium microphyllum*	20' H & W	2 - 3	FS - N - D - Also called foothills palo verde - Arizona state tree
Mexican Blue Oak	*Quercus oblongifolia*	30' H & W	2	FS - N - S E - Gray bark fissured in square plates - Sheds leaves in spring
Mexican Blue Palm	*Brahea armata*	40'H 25'W	2	FS - E - Takes heat & wind
Mexican Buckeye	*Ungnadia speciosa*	15' H & W	1 - 2	FS - Psh - D - T or S - * - Naturally a shrub, but can be pruned to tree form - Seeds poisonous
Mimosa (Silk Tree)	*Albizia julibrissin*	40'H 60'W	3	FS - Psh - D - Can be controlled to a 10 to 20 ' umbrella patio tree - Sometimes multi-stemmed
Mountain Mahogany	*Cercocarpus spp.*	See remarks	1 - 2	FS - E or D - T or S - Some N - Check with nursery for sizes
Netleaf Hackberry	*Celtis reticulata*	25-30 'H & W	3	FS - Psh - N - D - FR - Tree does not heave sidewalks - Good choice for street or lawn tree
New Mexican Locust	*Robinia neomexicana*	6 - 30' H & W	2	FS - N - D - T or S - FR - Thorns - Wood brittle - Fast growing - Aggressive roots - Suckers
Olive 'Swan Hill'	*Olea europaea*	25-30' H&W	2 - 3	FS - E - T - M - This is a sterile variety - Non-sterile varieties stain pavement and lawns and are allergenic
Pinyon Pine	*Pinus cembroides, edulis, monophylla*	10 - 25' H	1 - 2	FS - N - E - FL - Cones contain edible seeds -Pine nuts edible - Slow growing
Russian Olive	*Elaeagnus angustifolia*	20' H & W	2 - 3	FS - Psh - D - Can be clipped to make a hedge - Takes almost any kind of punishment
Screwbean Mesquite	*Prosopis pubescens*	30' H & W	2	FS - N - D - T or S - Seed pods tightly coiled in a spiral curl - Highly prized in dried arrangements
Shoestring Acacia	*Acacia stenophylla*	30' H 20' W	1 - 2	FS - D - FL - M - Thornless
Silverleaf Oak	*Quercus hypoleucoides*	40' H 35 'W	2 - 3	FS - N - SE - Leaves silvery white and woolly underneath - Sheds leaves in spring
Strawberry Tree	*Arbutus unedo*	8 - 35' H & W	3	FS - Psh - E -T or S - FR - Non-edible fruits resemble strawberries in texture - Several varieties
Sweet Acacia	*Acacia smallii*	10-35'H15-25'W	1 - 2	FS - D - FL - M - Thorns
Tecate Cypress	*Cupressus forbesii*	10-25'H 20'W	2 - 3	FS - E - FL - Fast grower - Keep on dry side so it won't grow so fast that it will topple
Texas Mountain Laurel	*Sophora secundiflora*	15-25'H10-15'W	3	FS - Psh - E - T or S - * - Naturally shrubby, but can be trained into a tree
Velvet Mesquite	*Prosopis velutina*	20' H 30' W	2	FS - N - D - Thorniness variable
Western Redbud	*Cercis occidentalis*	10-18 'H & W	3	FS - Psh - D - FR - Multi-stemmed T or S, magenta flowers in spring - Many seed pods in summer - 'Alba' is a 3 to 6' white-flowered shrub

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Common Name	Scientific Name	Mature Size	Watering Frequency	Remarks
Shrubs, Groundcovers, and Vines				
Agarita	*Berberis trifoliata*	6' H & W	3	FS - E - S - Some FR - Hollylike leaves - Yellow fragrant flowers Feb. thru Apr.
Apache Plume	*Fallugia paradoxa*	4-6' H 5' W	1	FS - N - E - S - Pruning usually not needed - Seed heads are feathery pink, like an Apache headdrress
Arizona Grape Ivy	*Cissus trifoliata*	Climbs to 30'&2'W	2 - 3	FS - V - * - Evergreen only in warmest locations - Useful for covering chain link fences or trellises
Arizona Rosewood	*Vauquelinia californica*	20' H 15'W	2 - 3	FS - N - E - S - Good hedge plant - Slow grower at start - Similar to oleander, but not toxic
Artemisia	*Artemisia spp.*	See remarks	2 - 3	FS - S or Gc - Some N - E - Check with nursery for hardiness and size
Autumn Sage	*Salvia greggii*	1-4' H & W	3	FS - E - S - FR - Blooms spring and fall - Many varieties covering wide color range - Deadhead - Cut back to one half in winter to keep it full
Baccharis `Starn'	*Baccharis `starn'*	3-4' H 4-5' W	2 - 3	FS - E - S - Tolerates desert heat & resists root rot - This male cultivar that does not produce seed clusters
Black Dalea	*Dalea frutescens*	3' H 4' W	2 - 3	FS - E - S - FR - Prune by one half in January - Overwatering or drought can cause partial leaf drop
Blackbrush Acacia	*Acacia rigidula*	10-15' H&W	1 - 2	FS - SE - D - T or S - Fragrant, pale yellow flowers almost glow on a bright spring day - To train to a single
Blue Elderberry	*Sambucus mexicana*	10-30'H 8-20'W	3	FS - Psh - N - E - T or S - Drops its foliage during drought
Bottlebrush	*Callistemon citrinus*	10-15' H&W	3	FS - E - T or S - Marginal - Bruised leaves smell lemony
Broom Dalea	*Psorothamnus scoparia*	3' H 4' W	2	FS - N - D - S - Requires sandy soil - Does not tolerate overwatering - Attractive erosion control
Buckwheat	*Eriogonum spp.*	See remarks	2 - 3	FS - E - S - Some N - FL - Check with nursery for size and hardiness
Bush Germander	*Teucrium fruticans*	4-8' H & W	3	FS - E - S - Blooms almost year-round
Bush Morning Glory	*Convolvulus cneorum*	2-4' H & W	3	E - FS - Psh - * - S or Gc - M - Best in sun
California Grape	*Vitis californica*	To 30'	1 - 2	FS - Psh - D - V - Leaves emerge grayish, mature to green, turn red or yellow in autumn - Several varieties
Cat's Claw	*Macfadyena unguis-cati*	25-40' spread	3	FS - Psh - E or D - V or Gc - After bloom, cut back some stems to stimulate growth lower down - Pinch back vigorous shoots as needed - Do not grow on stucco as it may pull the stucco off
Chuparosa	*Justicia californica*	3'H 4'W	2 - 3	FS - Psh - SE or D - S - M - May freeze to ground in winter, but will come back quickly in spring
Cleveland Sage	*Salvia clevelandii*	3-5' H 5-' W	3	FS - FR - E - S - Many hybrids - Remove faded spikes to encourage rebloom
Cliffrose	*Purshia mexicana*	6' H & W	2 - 3	FS - E - S - N - FL - Fragrant creamy flowers
Climbing Milkweed	*Funastrum cynanchoides*	10' long	2 - 3	FS - Psh - N - D - V - Starlike white flowers bloom May to September
Coffeeberry/Buckthorn	*Frangula californica*	3-15' H - 8' W	3	FS - Psh - E - S - N - No irigation needed when established - Check with nursery for size & color
Coral Bean	*Erythrina flabelliformis*	3-4' H - 2' W	2	FS - N - D - S - * - FR - Short spines - Seeds poisonous - Will freeze to ground in winter, but will recover
Cotoneaster	*Cotoneaster spp.*	See remarks	2 - 3	FS - D, E, or SE - S or Gc - FR - Many cotoneasters OK in our area - Check nurseries for hardiness and size
Crape Myrtle	*Lagerstroemia spp.*	See remarks	3	FS - D - S - FR - Several species, many varieties - Check with nursery for size and colors
Creeper Vines	*Parthenocissus spp.*	See remarks	3	FS - Psh - N - D - V - Handsome foliage is beautifully colored in autumn - P. henryana marginal in our zone -
Creeping Sage	*Salvia chinophylla*	4" H - 4' W	2 - 3	FS - E - Gc - FR - Interesting, attractive plant all year - Small blue flowers
Creosote Bush	*Larrea tridentata*	4-6 'H - 8' W	1 - 2	FS - N - E - S - FL - Plants in shade become leggy
Crucillo	*Condalia lycioides, mexicana, spathulata*	8-' H - 10' W	2	FS - N - E - S - Impenetrable security barrier - Slow growing

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Common Name	Scientific Name	Mature Size	Watering Frequency	Remarks
Damianita	*Chrysactinia mexicana*	2' H & W	2 - 3	FS - E - S - Shear in early spring - Cut back severely if plant too woody
Desert Broom	*Baccharis sarothroides*	5' H & W	2 - 3	FS - N - E - S - Purchase male plants only, females produce messy cottony seed clusters
Desert Hackberry	*Celtis pallida*	10' H & W	2 - 3	FS - Psh - N - D - FR - T or S - Good for screen, barrier or erosion planting
Desert Honeysuckle	*Anisacanthus quadrifidus wrightii*	3' H - 4' H	3	FS - Psh - D - S - Rabbits love new shoots, so protect - For compact shape and prolific bloom, cut back to 1/2 to 1/3 before spring growth - Attracts hummingbirds
Desert Honeysuckle	*Anisacanthus thurberi*	4' H & W	3	FS - D - N - S - Cut to ground before spring growth to rejuvenate - Attracts hummingbirds
Desert Lavender	*Hyptis emoryi*	3-10'H - 3-8'W	2 - 3	FS - E - S - M - Erect or spreading shrub - May die to roots in winter
Desert Olive	*Forestiera neomexicana*	12-18'H 12'W	2 - 3	FS - D - T or S - Fairly fast grower - Can be trained to be a small multi-trunked tree
Desert Sage	*Salvia dorrii*	1-3' H 2-4' W	3	FS - E - S - FR - Good in dry desert garden
Desert Scrub Oak	*Quercus turbinella*	10' H & W	2	FS - E - S - N - Water during dry spells - Can be trained as a small tree
Desert Spoon	*Dasylirion wheeleri*	3-5' H 4-5' W	1 - 2	FS - Psh - N - E - S - Spherical clump - In fall, 9 -15' flower spikes - Prized in dry arrangements
Dusty Miller	*Senecio cineraria*	2' H & W	2 - 3	FS - E - S - FR - Another dusty miller - Gets legggy unless sheared occasionally
Dusty Miller	*Senecio viravira*	4' H & W	2 - 3	FS - Psh - S - FR - Fuller in full sun - Tip-pinch young plants to keep them compact
Evergreen Sumac	*Rhus virens*	12' H & W	2 - 3	FS - Psh - E - S - N - Use as informal hedge or as background for other plants
Fairy Duster	*Calliandra eriophylla*	1-3' H - 4' W	1 - 2	FS - Psh - N - D - S or Gc - * - FR - No irrigation needed, but blooms will last longer with some summer water
False Mockorange	*Fendlera rupicola*	4'H & 4'W	2	FS - D - S - N - Fragrant white flowers bloom in spring
Fern Acacia	*Acacia angustissima 'Hirta'*	5' H & W	2	FS - Psh - N - D - S - May freeze to ground in winter, but will recover - Soak root zone every month or two in summer, less or not at all in winter
Fernbush	*Chamaebatiaria millefolium*	6-8'H&W	2 - 3	FS - E- SE - D - S - Fragrant, light green ferny foliage - Upright white flower clusters 4" long
Firethorn	*Pyracantha spp.*	See remarks	2 - 3	FS - E - S - FR - Many species and hybrids - Check with nursery for sizes
Four-wing Saltbush	*Atriplex canescens*	3-6' H 4-8' W	1 - 2	FS - E - S - N - FR - To keep compact, cut back by one third each year before spring growth
Gambell Oak	*Quercus gambellii*	15-30'H 15'W	2 - 3	FS - N - D - T or S - Foliage turns yellow-red or orange in fall
Giant Flowered Purple Sage	*Salvia pachyphylla*	3'H 2.5'W	2	FS - FR - E - S - Blooms all summer - Evergreen silver foliage - Prune & shape in fall
Golden Dalea	*Dalea capitata*	8"H 3'W	2 - 3	FS - E - S or Gc - FR - Cut back in winter to generate new spring growth -Overwatering or drought can cause partial leaf drop
Green Desert Spoon	*Dasylirion acrotriche*	3-4' H - 4-5' W	1 - 2	FS - Psh - E - S - Spherical clump - 10' or higher flower stalk
Green Hopbush	*Dodonaea viscosa*	10' H & 6' W	2 - 3	FS - Psh - N - E - S - S - FL - Can be trained as a small tree
Heavenly Bamboo	*Nandina domestica*	3-6' H 2-3' W	2 - 3	FS - Psh - E - S - FR - Many varieties - All types turn crimson in fall - Cut oldest canes to ground in spring before growth begins - Dwarf varieties available
Holly Redberry	*Rhamnus ilicifolia*	15' H & W	1	FS - Psh - E - S - No irrigation needed when established - Bulky shrub or shrubby tree
Indigo Bush/Silver Dalea	*Dalea bicolor*	3-4' H & W	2 - 3	FS - E - SE - D - S - FR - Rapid regrowth from hard winter pruning brings a quick crop of fresh foliage - Overwatering or drought can cause partial leaf drop
Jojoba (Goat Nut)	*Simmondsia chinensis*	3-6' H & W	2	FS - E - S - N - M - Inconspicuous flowers - Can be used as a hedge - Available in dwarf form
Juniper	*Juniperis spp.*	See remarks	2 - 3	FS - Psh - E - S or Gc - FL - Expect root rot if soil is waterlogged - Check with nursery for hardiness and size - Don't plant next to lawn sprinklers or overwater
Kidneywood	*Eysenhardtia orthocarpa*	20' H 12' W	1 - 2	FS - N - D - T or S - Excellent tree for small spaces - White vanilla scented flowers spring to summer
Lantana	*Lantana spp.*	See remarks	3	FS - D - S or Gc - * - All lantanas OK for our area - Many colors and varieties - Will die to ground in winter, but will recover - Check with nursery for size

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Lavender	*Lavandula spp.*	See remarks	3	FS - E - S - FR - Forms mounds - Many species - Check nursery for size, hardiness and color
Lion's Tail	*Leonotis leonurus*	4 - 6' H & W	1 - 2	FS - E - S - If frost hits, cut back to live growth in spring
Little-leaf Cordia	*Cordia parvifolia*	4-8' H 4-10' W	2 - 3	FS - E - S - FR - Can be used as an informal hedge
Lycium	*Lycium spp.*	6' H & W	2	FS - N - D - S - Can be used for barrier plantings
Manzanita	*Arctostaphylos pungens*	6' H & W	2 - 3	FS - Psh - N - E - S - Smooth red bark and crooked branches
Mexican Buckeye	*Ungnadia speciosa*	15' H & W	3	S - Psh - D -T or S - * - Large shrub, but can be trained into a tree - Summer irrigational optional
Mexican Grass Tree	*Dasylirion quadrangulatum*	10-16'H & 9' W	1 - 2	FS - Psh - M - E - S - Green leaves in fountainlike clump
Mojave Sage	*Salvia mohavensis*	2' H 2.5' W	2	FS - E - S or Gc - FR - Be careful not to overwater in summer - Fragrant foliage
Mormon Tea	*Ephedra spp.*	See remarks	1 - 2	FS - Some N - E - S - Erect and densely branched - Check with nursery for sizes
Mountain Mahogany	*Cercocarpus spp.*	See remarks	1 - 2	FS - E or D - T or S - Some N - Check with nursery for sizes
Muhgo Pine	*Pinus mugo mugo*	4-8' H 8-15' W	2	FS - E - S - FL - Group includes compact selections
Myoporum	*Myoporum parvifolium*	3-6" H 9' W	2 - 3	FS - E - S - Marginal - Great ground cover - Some dieback in cold winters, recovers rapidly
Myrtle	*Myrtus communis*	5-6" H 4-5' W	2 - 3	FS - Psh - E - S - FR - Many named selections - Check with nursery for size and hardiness
New Mexican Locust	*Robinia neomexicana*	6 - 30' H & W	2	FS - N - D - T or S - FR - Thorns - Wood brittle - Fast growing - Aggressive roots - Suckers
Ocotillo	*Fouquieria splendens*	8-15'H 5-10'W	1 - 2	N - D - S - Attractive long red flower clusters resemble candles - Does not regularly have leaves
Oleander	*Nerium oleander*	3-20'H 4-12'W	2 - 3	FS - E - S - * - FR - Routine pruning not necessary - Do not burn wood, smoke may cause skin irritation
Paperbag Bush	*Salazaria mexicana*	3' H & W	2	FS - D - S - Common name refers to fruit that develops into an inflated pouch
Pineleaf Milkweed	*Asclepias linaria*	2' H 3' W	2	FS - E - S - N - M - Delicate needle-like leaves, 2" white-flower clusters bloom Mar - Dec.
Quail Bush	*Atriplex lentiformis*	3-10'H 6-12'W	1 - 2	FS - D - S - FR - Cut back by one third before spring growth
Rabbitbrush	*Chrysothamnus nauseosus*	6 ' H 3' W	1 - 2	FS - N - E - S - FR - Leaves and stems aromatic - Good for natural plantings - C. viscidiflorus also available - Important: must have good drainage
Rasberry Delignt	*Salvia hybrid*	3' H & W	3	FS - Psh - E - S - FR - The deep green foliage has an herbal fragrance when crushed
Red Barberry	*Berberis haematocarpa*	5' H & W	3	FS - Psh - N - E - S - Attractive foliage, pretty flowers, showy berries - Other barberrys not water wise
Red Bird of Paradise	*Caesalpinia pulcherrima*	2-4' H & W	1 - 2	FS - D - S - M - Dies to ground in winter - Prune before spring growth - Red flowers
Rosemary	*Rosmarinus officinalis*	See remarks	2 - 3	FS - E - S or Gc - Many varieties - Check nursery for size and characteristics
Royal Purple Sage	*Salvia muelleri*	2-3'H 4-6'W	3	FS - E - S - FR - Drought tolerant - Spring to fall flowers
Santolina	*Santolina spp.*	See remarks	2	FS - E - S - FR - Size varies by species - Cut back yearly before spring growth
Scarlet Creeper	*Ipomoea coccinea*	8' H	2	FS - N - Vine - * - Bright red tubular flowers frequented by hummingbirds
Scarlet Sage	*Salvia microphylla*	4' H & 3' W	3	FS - E - S - Usually 3-4'H 3-6'W - Available in various colors
Screwbean Mesquite	*Prosopis pubescens*	30' H & W	2 - 3	FS - D - T or S - N - Can be trained as a tree - Can be multi-stemmed - Spirally twisted seed pods
Shrubby Cinquefoil	*Potentilla fruticosa*	1-3'H 3-4'W	3	Psh in hottest climates - D - S - Many varieties, white pink, red and yellow flowers
Shrubby Senna	*Cassia wislizenii*	5-8'H 5-10-'W	2 - 3	FS - N - D - S - Brilliant yellow-flowers in late summer
Silk Tassel	*Garrya wrightii*	8' H 6'W	1 - 2	FS - Psh - N - E - S - FR -Can be used as an informal hedge
Smoke Bush/Indigo Bush	*Dalea pulchra*	8'H 5'W	2 - 3	FS - E - S - N - Spectacular spring bloom of purple flower clusters - Allow ample room to grow
Snakeweed	*Gutierrezia sarothrae*	18' H 2' W	1 - 2	FS - N - E - S - Low-growing shrub with July to Sept flowers can brighten a desert garden
Strawberry Tree	*Arbutus unedo*	8 - 35' H & W	3	FS - Psh - E - T or S - FR - Fruits resemble strawberries in texture - Several varieties

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Common Name	Scientific Name	Mature Size	Watering Frequency	Remarks
Sumac	*Rhus spp.*	See remarks	2 - 3	FS - E & D - T or S - Some N - FR - Check with nursery for size and hardiness
Sun Rose	*Helianthemum nummularium*	6" H 18" W	3	FS - Psh - E - Gc - Several colors - Shear after flowering for light repeat blooming
Texas Mountain Laurel	*Sophora secundiflora*	15-25'H10-15'W	3	FS - Psh - E - T or S - * - Naturally shrubby, but can be trained into a tree
Texas Ranger/Sage	*Leucophyllum spp.*	See remarks	2 - 3	FS - E - S - Many species - Requires little or no pruning - Check nursery for size
Texas Sotol	*Dasylirion texanum*	5' H & W	1	FS - E - S - 15' H flower stalk
Threadleaf Grounsel	*Senecio longilobus*	3'H 2'W	1 - 2	FS - N - E - S - * - Poisonous to livestock - Common on overgrazed grasslands - Do not overwater
Tombstone Rose	*Rosa banksiae*	See remarks	3	FS - E - S - Can grow to humongous size, but can be controlled - Local experience says moderate water OK
Trailing Indigo Bush	*Dalea greggii*	1.5'H 6'W	2 - 3	FS - E - Gc - N - FR - Mounding habit - Overwatering or drought can cause partial leaf drop
Turpentine Bush	*Ericameria laricifolia*	2 - 3' H	2	FS - N - E - S - FL - If the plant becomes lanky, prune it back and it will regrow with dense foliage
White Thorn Acacia	*Acacia constricta*	6 - 20' H & W	2	FS - N - D - S - Bark looks red in winter when wet
Whitebrush	*Aloysia gratissima*	6'H 8'W	3	FS - Psh - D - S - Flowers strongly vanilla scented
Wild Cotton	*Gossypium thurberi*	2 - 6' H 3' W	2 - 3	FS - Psh - N - D - S - FL - Head back fast growing terminal branches to side buds for a more compact plant
Winter Fat	*Ceratoides lanata*	1.5 - 3' H & W	2 - 3	FS - Psh - N - E - S - Can be used in dry arrangements
Wisteria	*Wisteria spp.*	See remarks	2 - 3	FS - D - S - * - Check nursery for exposure and size for different species and varieties - Control size & shape and encourage bloom production by pruning and training - W. sinensis will bloom in FS or in Psh
Wooly Butterfly Bush	*Buddleja marrubiifolia*	5' H & W	2 - 3	FS - E - S - Small, balll shaped, orange flower clusters in spring and summer - Prune after bloom
Wright's Bee Bush	*Aloysia wrightii*	5' H & W	3	FS - Psh, but prefers sun - N - D - S - Blooms spring through fall
Xylosma	*Xylosma congestum*	8-10' H & W	3	FS - Psh - E or D -T or S - Single or multi-stemmed - Stems zigzag and branches droop - X. compacta grows slowly to half the size of species
Yellow Bells	*Tecoma stans*	8' H 5' W	3	FS - Psh - N - E - S - M - Will die back in winter, but will recover quickly
Yellow Bird of Paradise	*Caesalpinia gilliesii*	5-10 'H 4' W	1 - 2	FS - D - T or S - * - Yellow flowers with red stamens - Naturalized
Annuals (A) *(flowers first year, then dies)* **, Biennials (B)** *(flowers 2nd year, then dies)* **, Perennials (P)** *(flowers every year)*				
Includes some flowers that can be used as groundcovers ***(Gc)***				
Agastache	*Agastache spp.*	2-4' H & W	3	FS - Psh - P - Check nursery for interesting hybrids and water requirements - Reblooms if deadheaded
Albert's Buckwheat	*Eriogonum alberti*	1.5' H 1'W	1	FS - N - P - FL - Tiny pink flowers appear in clusters mid-summer through fall
Alyssum	*Alyssum wulfenianum*	1.5' W mound	3	FS - Psh - P - Prostrate & trailing with pale yellow flowers
Angelita Daisy	*Tetraneuris acaulis*	8" H 12' W	2 - 3	FS - E - P - 1' stems - Daisy yellow flowers nearly all year in mild winter climates - Cut off faded flowers to prolong bloom
Arizona Blue Eyes	*Evolvulus arizonicus*	1' H & 1' W	1	FS - N - P - Gc - Usually grown as an annual
Artemisia spp.	*Artemisia spp.*	See remarks	2 - 3	FS - E - P - Many species - Some N - Inquire at nursery for size, exposure and hardiness - Perennials & evergreen shrubs
Bahia	*Bahia absinthifolia*	1' H & W	1	FS - N - E -P - Gc - Shallow caliche soil OK - Fast growth rate - New plants volunteer readily

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Basket of Gold	*Aurinia saxatilis/Alyssum*	8-12" H mound	3	FS - Psh - P - Many varieties - E - Shear lightly to one half right after bloom
Bear Grass	*Nolina microcarpa*	3'H 6'W	1 - 2	FS - N - P - Strong vertical silhouette - Good for dry landscapes
Blackfoot Daisy	*Melampodium leucanthum*	1' H & W	2 - 3	FS - N - P - If straggly, cut back in fall - Grows best in decomposed granite
Blue Sage	*Salvia chamaedryoides*	1-2' H 2-3' W	3	FS - E - P - M - FR - Deadhead to encourage rebloom
'Boothill'	*Conoclinium (Eupatorium) greggii*	1.5 -2'H 1-3'W	2	FS - Psh - N - P - First found near Tombstone - Fluffy lavender flowers late spring to fall
Butterfly Weed	*Asclepias tuberosa*	3' H 1' W	3	FS - N - P - Long lasting cut flowers
Californica Poppy	*Eschscholzia californica ssp. mexicana*	8" H 1' W	2 - 3	FS - FR - N - A - Deep golden flowers in spring
Catmint/Catnip	*Nepeta spp.*	See remarks	3	FS - Psh - P - Great for attracting every cat in the neighborhood into your yard - Many varieties, check for height width and hardiness
Chamomile	*Chamaemelum nobile*	3-12" mat	3	FS - Psh - P - Small yellow button flowers - Useful between stepping stones
Chocolate Flower	*Berlandiera lyrata*	1.5 - 3' H & W	2	FS - E - N - P - Shear seedheads lightly to encourage more bloom - Dry for winter bouquets
Clary Sage	*Salvia sclarea*	3-4' Flower Stalks & 2-3' W	2 - 3	FS - FR - B or short-lived P - Cutting stems before seeds form produces rebloom and may prolong plant's life
Clustered Goldflower	*Tetraneuris scaposa*	8"H 12"W	2 - 3	FS - E - P - 16" stems - Cut off faded flowers to prolong bloom
Common Yarrow	*Achillea millefolium*	See remarks	2 - 3	FS - E - P - FR - Many varieties of different colors - Spreads by underground runners
Coreopsis	*Coreopsis spp.*	See remarks	2 - 3	FS - FR - A and P - Many species - Check with nursery for hardiness, size and interesting varieties
Cosmos	*Cosmos spp.*	See remarks	3	FS - A and P - Several varieties from 1 to 7' H - Various colors
Desert Marigold	*Baileya multiradiata*	1.5' H & 1' W	2	FS - N - E - A or P - FR - Short-lived, but freely reseeds
Desert Phlox	*Phlox tenuifolia*	2' H & W	3	FS - Psh - N - P - Mounded white flowers
Dusty Miller	*Centaurea, Artemisia, Senecio spp.*	See remarks	2 - 3	FS - E - A, P or B - Common name given to many plants with lovely gray foliage - H & W varies
Dyssodia (Includes Dogweeds,Dahlberg Daisy and Golden Fleece))	*Thymophylla spp.*	4"-1'H 4"-1.5'W	3	FS - E - Some N - P - Some grown as annuals - Mounds - Blooms summer to fall - When plants get ragged, pull them out - Can easily be started from seed
Euphorbia	*Euphorbia spp.*	See remarks	2	Water requirements, exposure, size vary by species - Some native - Some D, Some E - A, B or P - * - ,About 2000 species in genus - Only buy plant species that use moderate or less water - Can be trees, shrubs, perennials, or annuals - All euphorbias have a milky white sap that is toxic on contact, including gopher plants and poinsettias
Evening Primrose	*Oenothera spp.*	See remarks	2 - 3	FS - Psh - N - P - FR - Some native - Open during day - Stems die back in winter All except Oenothera elata hookeri OK for our area - Sizes variable, check with nursery
Fernleaf Yarrow	*Achillea filipendulina*	4-5'H 3'W	2 - 3	FS - E - P - Deep green fernlike leaves - Bright yellow flowers - Several varieties
Firewitch	*Dianthus gratianopolitanus*	1' W mat	3	FS - Psh - P - Gc - Gray-blue foliage, hot-pink flowers
Flame Flower	*Phemeranthus calycinum*	8-12" H 5' W	3	FS - P - Long summer bloomer - Often goes dormant before first frost

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Fleabane	*Erigeron spp.*	See remarks	2 - 3	FS - Psh - E - P - Some N - FR - Check with nursery for sizes and hardiness
Fringed Wormwood	*Artemisia frigida*	1.5' H & W	2 - 3	FS - E - P - Cut back as needed
Gaillardia	*Gaillardia spp.*	2-4' H 1 1/2' W	2 - 3	FS - Some N - A or P - FR - Height of the several species vary - Check with nursery
Gaura	*Gaura lindheimeri*	2-4' H 2-3' W	2 - 3	FS - P - FR - Several varieties - Remove seed-bearing spikes to improve appearance - Long bloom period
Germander	*Teucrium x lucidrys*	1' H 2' W	3	FS - E - P - Thin and cut back before spring growth begins - T. prostratum is 4 to 6" Hi and 3' or more wide
Gilia	*Gilia spp.*	See remarks	2 - 3	FS - Some N - A - Check nursery for sizes - Flowers late spring to early fall
Globe Thistle	*Echinops spp.*	2-4' H 2' W	3	FS - P - Several species - Check with nursery - Excellent for dry arrangements
Globemallow	*Sphaeralcea spp.*	2-4' H 1.5-3' W	1 - 2	FS - D - P - Some N - Cut old stems almost to ground in spring - Many colors available
Goldeneye	*Heliomeris (Viguiera) spp.*	3' H & 3' W	2 - 3	FS - Some N - A or P - Cut back after bloom or before new growth begins - Can be grown from seed
Goldenrod	*Solidago spp.*	1-3'H 2'W	3	FS - Psh - P - * - Four native Solidago species in Cochise County - 1 1/2 to 3'H 2"W - Does not cause hay feve
Hardy Hummingbird Trumpet/California Fuschia	*Zauchneria californica latifolia*	1.5' H 2' W	2 - 3	FS - P - 'Everett's Choice' is an improved variety - 'Arizonica' is 3' high and has bright orange flowers
Hardy Jerusalem Sage	*Phlomis russeliana*	36" H 20" W	3	FS - Psh - P - Yellow flowers, olive-green leaves
Hens and Chickens	*Sempervivum tectorum*	2-5"W rosettes	2	Psh - E - Sc - P - Water only to prevent shriveling
Ice Plant	*Delosperma spp.*	See remarks	2 - 3	FS - Psh - P - Sc - E - FR - Several species - Check with nurseries for size and hardiness
Jupiter's Beard	*Centranthus ruber*	3' H & W	2 - 3	FS - Psh - P - Not fussy about growing conditions - Blooms late spring through summer
Keller's Yarrow	*Achillea X kellereri*	6" H 12 ' W	3	FS - P - FR - Large white flower clusters continue through summer
Lambs Ears	*Stachys byzantina*	18" H	3	FS - Psh - E - P - Tongue-shaped woolly white leaves - Spreads by surface runners
Lavender	*Lavandula spp.*	See remarks	3	FS - A or P - FR - Many species and varieties available - All are water wise, but some are not hardy in our zone - Check with nursery for hardiness and size
Leadplant	*Amorpha canescens*	2-4' H 3' W	3	FS - P - Prune to one foot in fall to increase flowers
Logan Calhoun	*Callirhoe alcaeoides*	6" H 18-24"W	3	FS - P - Summer bloomer - White flowers
Mexican Catchfly	*Silene laciniata*	15" H & W	3	FS - N - P - Summer blooming - Too much water after established will cause plant to get floppy
Milkweeds	*Asclepias spp.*	See remarks	1 - 2	FS - Psh - P - Some N - Some E - Some V - Height and width vary by species
Moonshine Yarrow	*Achillea 'moonshine'*	1.5' - 2' H 2' W	2 - 3	FS - E - FR - P - Silver-gray foliage, deep yellow flowers
Mount Atlas Daisy	*Anacyclus depressus*	3" H 15" W	2 - 3	FS - E - P - Silvery-gray foliage with white daisy flowers - Good plant for edging pathways
Mountain Gold Alyssum	*Alyssum montanum*	4"H 18""W	3	FS - P - Gc - FR - After blooming is finished, sheer off the faded flowers just above the foliage and enjoy the texture of its low-growing gray-green mat of leaves
Mountain Marigold	*Tagetes lemmonii*	3-6' H & W	3	FS - E, SE or D - P - N - Leaves fragrant when rubbed - Can flower all year- Cut back after heavy bloom - Can get frost damage
Mullein	*Verbascum olympicum*	5' H 3' W	3	FS - P - Soft downy-white leaves, bright yellow flowers
Old Woman/Dusty Miller	*Artemisia stellerana*	2.5' 'H 3'W	2 - 3	FS - E - P - Another dusty miller
Oregano	*Origanum spp.*	2' H & W	2 - 3	FS usually - P - Many species, some not hardy in our area - Check with nursery for exposure and hardiness
Oriental Speedwell	*Veronica orientalis*	8" H 18" W	3	FS - P - Compact mounds of gray-green foliage, deep blue flowers
Paper Flower	*Psilostrophe spp.*	18" H & W	1 - 2	FS - E - N - P - Dried flowers can be used in arrangements

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Penstemon	*Penstemon spp.*	See remarks	2 - 3	FS - Psh - P - FR - Over 250 species, many natives - Check nursery for size, hardiness and water requirements If plants require regular water, then they are not acceptable.
Perennial Blue Statice	*Limonium latifolium*	30" H 24" W	3	FS - Psh - A or P - Airy summer bloomer with lavender-blue sprays - Good dried cut flower
Poppy Mallow	*Callirhoe involucrata*	5" H 24-30"W	2 - 3	FS - P - Wine-red flowers with a white eye all summer - Good cascader
Prairie Skullcap	*Scutellaria spp.*	See remarks	2 - 3	FS -Some N - E - P - Neat mound of lavender-blue flowers in late spring - Check with nursery for size
Prairie Zinnia	*Zinnia grandiflora*	4"H 15"W	1 - 2	FS - N - A in our zone - Late summer bloomer - Can be difficult to grow
Prince's Plume	*Stanleya pinnata*	36"H 18"W	2	FS - P - Clear yellow flowers - Cut off entire flower spike after blooming to fill out the plant
Purple Prairie Clover	*Dalea purpurea*	18" H & W	2 - 3	FS - M - P - Heavy summer bloomer
Red Hot Poker	*Kniphofia uvaria*	3' H & W	3	FS - P - M - Easy to grow - Grasslike foliage - Red & yellow spikes in summer
Red Yucca	*Hesperaloe parviflora*	3 - 4 ' H & W	2 - 3	FS - Psh - E - P - Heat tolerant - Red flowers - There are yellow and yellow-red -flowered forms
Russian Sage	*Perovskia*	3-4' H & W	2 - 3	FS - E - P - FR - Trim spent blossoms to extend bloom season - Several varieties
Sand Sagebrush	*Artemisia filifolia*	4' H 5' W	1 - 2	FS - * - P -many-branched shrub - Yellowish-white flowers bloom spring through fall
Sante Fe Helianthus	*Helianthus maximiliana*	6-8' H 4' W	3	FS - A or P - Fall bloomer has large golden-yellow flowers - Grows in any soil
Sedum/Stonecrop	*Sedum spp.*	See remarks	2 - 3	FS - Psh - E - P - Some N - FR - Many species - Check nursery for sizes - Will not take foot traffic
Serbian Yarrow	*Achillea serbica*	4" H 15" W	3	FS - P - FR - Slow-growing mats of evergreen leaves covered with numerous white flowers
Shrubby Ice Plant	*Ruschia calvinia pink*	18"H & W	3	FS - E - P - Shrublet - Clear pink flowers - Winter foliage is purple
Silver Speedwell	*Veronica incana*	10" H 15" W	3	FS - Psh - P - Blooms late spring, but will keep flowering all summer if deadheaded
Skeletonleaf Goldeneye	*Viguiera stenoloba*	3' H & W	1 - 2	FS - Psh - E - P - Differs in both culture & foliage from other desert plants - Can be utilized in medians, parking lot parking strips, and planter boxes
Stachys	*Stachys spp.*	Sizes vary	3	FS - Psh - P - FR - S.- Coccinea native in Cochise County - Not fussy about soil type - Needs good drainage
Sulfur Flower	*Eriogonum umbellatum*	1.5' H 3' W	2 - 3	FS - P - Prune to shape when plants are young
Sundrops	*Calylophus spp.*	1.5 'H 2' W	2 - 3	FS - Psh - Some N - P - FR - Prune just before spring growth begins - Flowers in spring and from late summer to late fall (actually into winter)
Thyme	*Thymus spp.*	See remarks	3	FS - Psh - P - Some grown as A - Many species and varieties - Check water use and size - Small space groundcovers
Tree Bear Grass	*Nolina matapensis*	10-25'H 10'W	2	FS - P - Lush looking species - Allow ample space for growth
Verbena	*Verbena bipinnatifida*	8-16"H 18"W	2 - 3	FS - FR - Gc - P - Some grown as annuals - Eight native verbenas in Cochise County - Fast-growing ground covers - Attractive in crevices and hanging baskets - V. bonariensis, V. gooddingii, V..x hortensis, V. peruviana, also attractive and acceptable
Verbena	*Verbena peruviana*	1'H 3'W	3	FS - E - P - Pink, red, white or purple flowers - Spreads by above-ground runners
Violet Cloud'	*Scutellaria x hybrid*	6" H 15" W	3	FS - Psh - E - P - Mounding habit - Water regularly first season
Western Blue Flax	*Linum lewisii*	3' H 1' W	3	FS - N - A or P - FR - Easy to grow from seed - Hard to divide - Other linums OK
Woolly Thyme	*Thymus lanuginosus*	2" H 18" W	3	FS - E - P - Low maintenance variety with tiny, felted, gray leaves - Good for high traffic areas -
Wright's Buckwheat	*Eriogonum wrightii*	18" H 24" W	1 - 2	FS - N - P - FL - Tiny white or pink flowers appear in clusters midsummer through fall
Yellow Stork's Bill	*Erodium chrysanthum*	5" H 12"W	3	FS - P - Late spring blooming - Primrose yellow flowers with lacy greeen foliage
Zexmenia	*Zexmenia hispida*	2-3' H & W	2 - 3	FS - Psh - P - Can lose leaves in cold winters

Recommended Plants for Sierra Vista by the UA Cooperative Extension Water Wise Program

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FS = Full Sun, **Psh** = Partial Shade, **FR =** Flame Resistant, **FL =** Flammable, ***** = Toxic, **M** = Not cold hardy in our area, **spp.** = Species
Supplemental **Watering** Frequency: **1** = None, **2** = Little, **3** = Moderate (every 2 to 3 weeks) **Refer to Watering Guidelines in introductory comments**

Common Name	Scientific Name	Mature Size	Watering Frequency	Remarks
Succulents				
Hundreds available, check with nursery for water requirements & hardiness - In general, succulents are FR				
Agaves: Most agaves die after flowering, may take five to forty years to flower.				
Agave Parviflora	*Agave parviflora*	6"H 8"W	1 - 2	FS - Psh - E - Sc - Petite plants ideal for pots or small patio areas
Agave Utah	*Agave utahensis*	1'H 2'W	1 - 2	FS - E - Sc - This species highly variable in form, size, and color - Often forms large clumps
Agave Victoria	*Agave victoriae reginae*	Clumps 1' W	1 - 2	FS - Psh - E - Sc - Slow growing, can stand in ground or pot 20 years before flowering, and then die
Arizona or Texas	*Echinocereus pectinatus*	1' H	1	FS - Psh - Some N - E - C - Alternating reddish and pale yellow horizontal bands on stem
Banana Yucca	*Yucca baccata*	3' H 5' W	1	FS - N - E - Sc - T or S - FR - Fruits look like short green bananas
Beaked Yucca	*Yucca rostrata*	12' H 9' W	1 - 2	FS - Sc - E - Treelike - Trunk covered with soft gray fuzz - Showy spikes of creamy white flowers
Beavertail Cactus	*Opuntia basilaris*	1' H 4' W	1	FS - E - C - Purplish pads - Very common in Arizona landscapes
Blue Yucca	*Yucca rigida*	12' H 5' W	1 - 2	FS - E - Sc - S or T - M - Dense spikes appear in spring or early summer
Cane Cholla	*Opuntia spinosior*	8' H 4' W	1	FS - N - E - C - Favored nesting plant for cactus wrens and thrashers - Magenta flowers, yellow fruit
Century Plant	*Agave americana*	6' H 10' W	1 - 2	FS - Psh - E - Sc - Variegated varieties available - Be sure you want a large plant before you buy it
Claret Cup	*Echinocereus triglochidiatus*	6"H	1	FS - N - E - C - One of nearly 50 hedgehogs - Showy red flowers - Forms clumps
Desert Christmas Cactus	*Opuntia leptocaulis*	2 - 3' H & W	1	FS - C - E - Thin stems with bright red fruit
Engleman's Prickly	*Opuntia englemannii*	15' spread	1	FS - N - E - C - Most common prickly pear in Arizona
Fishhook Barrel Cactus	*Ferocactus wislizenii*	10' H 3' W	1	FS - N - E - C - Yellow or yellow-edged flowers in fall - Hooked spines like fishhooks
Golden Barrel Cactus	*Echinocactus grusonii*	3' H 2' W	1	FS - Psh - E - C - M - Best known barrel - Combines well with other cacti and succulents
Huachuca Agave	*Agave parryi var. huachucensis*	2 - 3' W	1 - 2	FS - Psh - N - E - Sc - Common in the Huachuca Mountains
Lechuguilla	*Agave lechuguilla*	10-20"H 8"W	1 - 2	FS - Psh - E - Sc - Note small size - Colonizes
Mountain Yucca	*Yucca schottii*	6-15' H 3-4'W	1 - 2	FS - Psh - N - Sc - E - Clusters of white flowers from spring to midsummer
Palmer's Agave	*Agave palmeri*	3-4' H & W	1 - 2	FS - Psh - N - E - Sc -The most common agave found in the grasslands in this area
Parry's Agave	*Agave parryi*	2-3' W	1 - 2	FS - Psh - N - E - Sc - 2 - 3' rosettes - Several varieties available
Pincushions	*Mammillaria spp.*	2 - 6" H	1 - 2	Psh - Some N - E - C - Many species - Globe or cylindrical shape - Keep dry in winter to induce bloom - Many
Plain Soapweed	*Yucca glauca*	3-4' H & W	1 - 2	FS - Sc - E - In the summer green-white flowers are borne on narrow spikes 4' above foliage
Purple Prickly Pear	*Opuntia macrocentra*	4'H 6'W	1	FS - N - E - C - Spines are half white and half dark - 'Tubac' is said to hold purple color throughtout year
Rough-leaved Agave	*Agave scabra*	4' H & W	1 - 2	FS - Sc - E - Wide gray-green leaves rough on the back
Santa Rita Prickly Pear	*Opuntia santa-rita*	4'H 6'W	1	FS - N - E - C - The purple coloration of this prickly pear becomes more pronounced with drought or cold weather
Silver Cholla	*Opuntia echinocarpa*	3' H & W	1	FS - E - C - Spines not sharply barbed

Recommended Plants for Sierra Vista by the UA Cooperative Extension Water Wise Program

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FS = Full Sun, **Psh** = Partial Shade, **FR =** Flame Resistant, **FL =** Flammable, ***** = Toxic, **M** = Not cold hardy in our area, **spp.** = Species

Supplemental **Watering** Frequency: **1** = None, **2** = Little, **3** = Moderate (every 2 to 3 weeks) **Refer to Watering Guidelines in introductory comments**

Common Name	Scientific Name	Mature Size	Watering Frequency	Remarks
Soaptree Yucca	*Yucca elata*	6-20'H 8-10'W	1	FS - N - Sc - E - T or S - FR - Slow grower - 2' flowers on 3' annual spikes - Very common in grasslands
Teddybear Cholla	*Opuntia bigelovii*	3-6' H 3' W	1	FS - E - C -M - Beautiful, but treacherous
Tiger Tongue	*Opuntia ellisiana*	4'H 6'W	1	FS - E - C - Spineless small pads - Tidy prickly pear
Tree Cholla	*Opuntia imbricata*	6- 8 'H 10'W	1	FS - E - C - Deep pink flowers followed by green fruit - Shrubby when young, then treelike

Recommended Plants for Sierra Vista by the UA Cooperative Extension Water Wise Program

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FS = Full Sun, **Psh** = Partial Shade, **FR =** Flame Resistant, **FL =** Flammable, ***** = Toxic, **M** = Not cold hardy in our area, **spp.** = Species
Supplemental **Watering** Frequency: **1** = None, **2** = Little, **3** = Moderate (every 2 to 3 weeks) **Refer to Watering Guidelines in introductory comments**

Common Name	Scientific Name	Mature Size	Watering Frequency	Remarks
Grasses				
More available - Check nurseries for availablity, water needs & hardiness - All grasses flammable when dry - Almost all grasses are allergenic to some extent - Mowing grasses before they develop seedheads will reduce their tendency to be allergenic - Grasses listed below are bunch grasses unless noted				
Alkali Sacaton	*Sporobolus airoides*	3' H & W	2 - 3	FS - N - Warm season grass - Showy five foot tall, feather-like panicles in summer
Arizona Cottontop	*Digitaria californica*	2'H 1'W	1 - 2	FS - N - Warm season grass - Lovely silvery seedheads
Big Sacaton	*Sporobulos wrightii*	4-5'H & W	2 - 3	FS - N - Warm season grass - Showy seven foot tall, feather-like panicles in summer
Blue Grama Grass	*Bouteloua gracilis*	1.5' H 1' W	2	FS - N - Warm season turf and pasture grass - If used as turf it is not low water use
Bull Grass	*Muhlenbergia emersleyi*	1.5'H 3-4'W	2	FS - Psh - N - Warm season grass - Feathery spikes are purplish to reddish, fading to cream with age
Cane Beardgrass	*Bothriochloa barbinodis*	3'H 1.5'W	1 - 2	FS - Psh - Warm season grass - Can be scattered throughout a desert landscape
Indian Rice grass	*Achnatherum hymenoides*	1-2' H & W	1 - 2	FS - Cool season grass - Leaves green in cool weather, golden brown in summer heat - Useful plant in desert landscapes
Jose Select Tall Wheatgrass	*Elytrigia elongata 'Jose Select'*	4-5'H 1.5"W	3	FS - Warm season grass - Grows in any soil including highly alkaline clay
Mexican Feather Grass/Needle Grass	*Nassella tenuissima*	2'H 2-3'W	2	FS - Warm season grass - Among finest textured and most billowy looking of all grasses - Can be invasive
Muhly/Deer Grass	*Muhlenbergia spp.*	Size varies	2	FS - Psh - Some E in mild winters - Some N - Warm season grass
Pink Muhly	*Muhlenbergia capillaris*	3'H - 6'W	2	FS - Psh - Warm season grass - Very drought tolerant, looks better and bigger if given some water
Prairie Sky	*Panicum virgatum 'Prairie Sky'*	4 - 5'H 2'W	3	FS - Warm season grass - Tight growing upright columns of sky blue foliage
Purple Fountain Grass	*Pennisetum setaceum 'Rubrum'*	5' H & W	2	FS - Psh - Warm season grass - This attractive pennisetum variety usually does not self-sow - The green variety is invasive
Purple Three-Awn	*Aristida purpurea*	12 to 24"H 1' W	1 - 2	FS - N - Warm and cool season grass - Purple-tinted stems and flowers
Regal Mist	*Muhlenbergia capellensis*	3' H & W	2	FS - Warm season grass - Spectacular dusky pink in the fall
Side-oats Grama	*Bouteloua curtipendula*	1-2' H 2' W	1 - 2	FS - N - -Warm season grass - Grows from seed or division - Use in borders or rock gardens
Turf:				
Warm Season Grass				Blue Grama, Buffalo, Bermuda, etc.; 19.5 gallons/sq ft/year
Cool Season Grass				Fescue, Rye, etc.; 30.75 gallons/sq ft/year
Overseeded Cool & Warm				Overseeded Cool & Warm Season Grass - 29 gallons/sq ft/year

Wetting Areas Trees and Shrubs and Ground Covers/Vines:

Gallons needed to penetrate to root system based on wetting band of 2 feet around dripline

Canopy Diameter:	1' depth GC/Vines
0	0.0
0.5	0.6
1	1.3
1.5	1.3
2	1.3
3	5.9
4	7.9
5	9.8
6	11.8
7	13.7
8	15.7
9	17.6
10	19.6
11	21.6
12	23.5
13	25.5
14	27.4
15	29.4

Canopy Diameter:	2' depth Shrubs
0	0
0.5	1.2
1	2.5
1.5	2.5
2	2.5
3	11.7
4	15.7
5	19.6
6	23.5
7	27.4
8	31.3
9	35.2
10	39.2
11	43.1
12	47
13	50.9
14	54.8
15	58.7
16	62.6
17	66.6
18	70.5
19	74.4
20	78.3
25	97.9
30	117.5
35	137

Canopy Diameter:	3' depth Trees
0	0
0.5	1.9
1	3.7
1.5	3.7
2	3.7
3	17.6
4	23.5
5	29.4
6	35.2
7	41.1
8	47
9	52.9
10	58.7
11	64.6
12	70.5
13	76.3
14	82.2
15	88.1
16	94
17	99.8
18	105.7
19	111.6
20	117.5
21	123.3
22	129.2
23	135.1
24	140.9
25	146.8
30	176.2
35	205.5
40	234.9
45	264.3
50	293.7
55	323.1
60	352.5

Type Key:

T: Tree

S: Shrub

G: Groundcover/Vine/Grass

Watering Frequency Key:

3: Moderate Water Use Plant - 14 waterings/year

2 -3: Low to Moderate Water Use Plant - 11 waterings/year

2: Low Water Use Plant - 6 waterings/year

1-2: Very Low to Low Water Use Plant - 3 waterings/year

1: Very Low Water Use Plant - no supplemental watering

APPENDIX B:
Legal Description

Exhibit A

Parcel I:

(Parcel A)
That portion of the North one-half of the Northwest quarter of Section 29, Township 22 South, Range 21 East of the Gila and Salt River Base and Meridian, Cochise County, Arizona, described as follows:

BEGINNING at the Northwest corner of said Section 29;
thence North 89°58'15" East, along the North line of said Northwest quarter, a distance of 2,570.22 feet to a line 75.00 feet Westerly of and parallel with the East line of said Northwest quarter;
thence South 00°00'57" East, along said parallel line, a distance of 542.74 feet;
thence South 50°00'00" West, 326.95 feet;
thence South 84°45'00" West, 910.00 feet;
thence South 65°15'00" West, 860.00 feet;
thence South 78°00'00" West, 290.00 feet;
thence South 82°30'00" West 200.01 feet to a line 40.00 feet North of and parallel with the South line of said North one-half of Northwest quarter;
thence South 89°58'43" West, along said parallel line, a distance of 149.70 feet to a line 40.00 feet North of and parallel with the South line of the North one-half of the Northeast quarter of Section 30, Township 22 South, Range 21 East of the Gila and Salt River Base and Meridian, Cochise County, Arizona;
thence North 89°50'31" West, along said parallel line, a distance of 0.08 feet with West line of said Northwest quarter;
thence North 00°02'39" West, along said West line, a distance of 1,281.36 feet to the POINT OF BEGINNING;

TOGETHER WITH:

(Parcel B)
The North one-half of the Northeast quarter of Section 30, Township 22 South, Range 21 East of the Gila and Salt River Base and Meridian, Cochise County, Arizona;

EXCEPT from the North one-half of the Northeast quarter of Section 30, the following described parcels (a and b)

(a) The South 40.00 feet of said North one-half of the Northeast quarter; and
(b) The North 145.00 feet of the East 187.00 feet of the Northeast
EXCEPT the North 64.00 feet thereof; and
EXCEPT the East 62.00 feet thereof.

(Parcel C)
That portion of the Southwest quarter of Section 20, Township 22 South, Range 21 East of the Gila and Salt River Base and Meridian, Cochise County, Arizona, bounded as follows:

Bounded on the West by the West line of said Southwest quarter;

Bounded on the North by the South line of GOLDEN ACRES MOBILE HOME PARK UNIT 2, as recorded in Book 9 of Maps and Plats, page 22, records of Cochise County, Arizona;
Bounded on the East by a line 1709.14 feet West of and parallel with the East line of said Southwest quarter;
And bounded on the South by the South line of said Southwest quarter;

TOGETHER WITH:

(Parcel D)
That portion of the Southeast quarter of Section 19, Township 22 South, Range 21 East of the Gila and Salt River Base and Meridian, Cochise County, Arizona, bounded as follows;

Bounded on the West by the West line of said Southeast quarter;
Bounded on the North by the South line of GOLDEN ACRES MOBILE HOME PARK as recorded in Book 7 of Maps and Plats, page 15, records of Cochise County, Arizona, and the South line of GOLDEN ACRES MOBILE HOME PARK UNIT 2, as recorded in Book 9 of Maps and Plats, page 22, records of Cochise County, Arizona;
Bounded on the East by the East line of said Southeast quarter;
And bounded on the South by the South line of said Southeast quarter;

EXCEPT from all of Parcel I an undivided 1/2 interest into all oil, gas and other minerals as recorded in Docket 256, page 599, records of Cochise County, Arizona.

Parcel II:

That portion of the Southwest quarter of Section 20, Township 22 South, Range 21 East of the Gila and Salt River Base and Meridian, Cochise County, Arizona, described as follows:

COMMENCING at the Northwest corner of said Southwest quarter;
thence North 89°55'52" East, along the North line of said Southwest quarter, a distance of 936.01 feet to the POINT OF BEGINNING at the Northeast corner of GOLDEN ACRES MOBILE HOME PARK UNIT 2 as recorded in Book 9 of Maps and plats, page 22, records of Cochise County, Arizona;
thence continue North 89°55'52" East, along said North line, a distance of 1,634.18 feet to a line, 75.00 feet West of and parallel with the East line of said Southwest quarter;
thence South 00°02'34" East, along said parallel line, a distance of 2,645.86 feet to the South line of said Southwest quarter;
thence South 89°58'15" West, along said South line, a distance of 1,634.14 feet to a line 1,709.14 feet Westerly of and parallel with said East line of Southwest quarter;
thence North 00°02'34" West, along said parallel line, a distance of 2,159.88 feet to the Southeast corner of said GOLDEN ACRES MOBILE HOME PARK UNIT 2;
thence North 00°02'52" West, along the East line of said GOLDEN ACRES MOBILE HOME PARK UNIT 2, a distance of 484.58 feet to the POINT OF BEGINNING;

EXCEPT an undivided 1/2 interest into all oil, gas and other minerals as reserved in Deed recorded in Docket 256, page 599, records of Cochise County, Arizona.

APPENDIX C:
Hydrologic and Hydraulic Report

PRELIMINARY
HYDROLOGIC AND HYDRAULIC REPORT
FOR
GOLDEN ACRES PARCEL
SIERRA VISTA, ARIZONA

Prepared for:

EEC, Inc.
4625 E. Fort Lowell Road
Tucson, Arizona 85712
(520) 321-4625

Prepared by:

Arroyo Engineering, LLC
5675 N. Oracle Road
Suite 3203
Tucson, Arizona 85704
(520) 882-0206

Arroyo Job # EEC17

Registered Professional Engineer (Civil)
CERTIFICATE NO.
18683
ROBERT J.
SMOLINSKY
Date Signed 9-13-05
ARIZONA, U.S.A.

September, 2005

ARROYO ENGINEERING, LLC

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Registered Professional Engineer (Civil)
CERTIFICATE NO.
18683
ROBERT J.
SMOLINSKY
Date Signed 9-13-05
ARIZONA, U.S.A.

I. INTRODUCTION

1.1 Project Location

This drainage report was prepared for a parcel of land, located within portions of Sections 19, 20, 29 and 30 of T22S, R21E, Cochise County, Arizona . The property, which is located southeast of the intersection of State Route 92 and Golden Acres Drive, is approximately 350 acres in area and is currently vacant land. Figure 1 of this Report provides a location map for the parcel.

1.2 Purpose

This project was undertaken to assess the impacts that stormwater runoff will have with respect to future development of the property. A hydrologic and hydraulic assessment was performed using methodologies specified by The City of Sierra Vista drainage design standards. 100-year peak discharges have been estimated for all drainage concentration points entering and exiting the parcel. Floodplain limits have been established for all on-site flows that have 100-year peak discharge of 100 cfs, or greater.

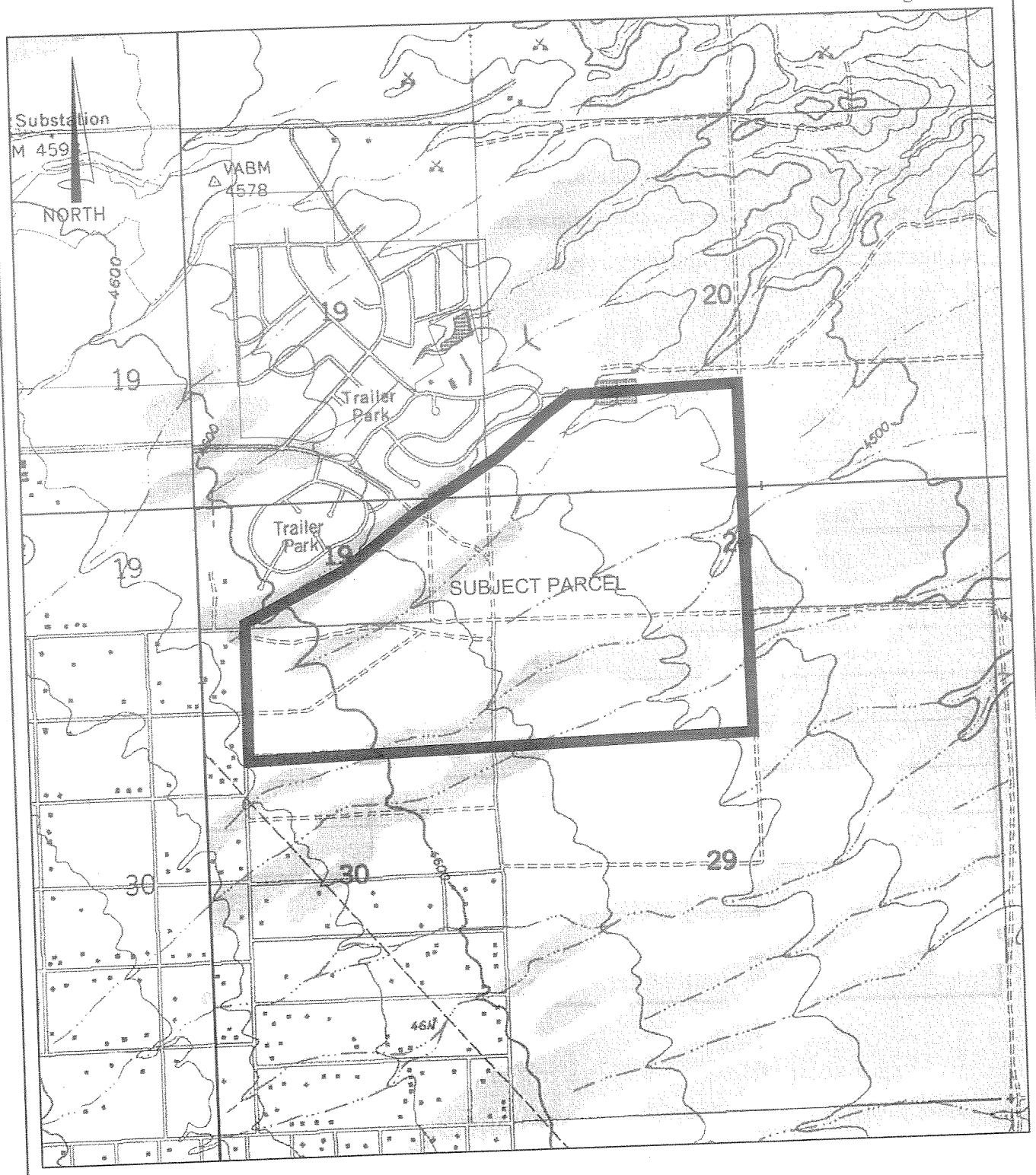


FIGURE 1
LOCATION MAP

II. HYDROLOGIC ANALYSIS

Two watersheds impact this project, as shown on Figure 2 of this report. This off-site runoff combines with on-site runoff and flows northeasterly across the parcel within existing watercourses. Table 1 of this report provides a summary of the existing 100-year peak discharges used for this project. Appendix A of this report provides the hydrologic calculations which support the summary presented within Table 1.

TABLE 2.1
SUMMARY OF EXISTING 100-YEAR PEAK DISCHARGES

C.P.	DRAINAGE AREA (acres)	Q_{100} (cfs)
10E	259	291
10.1E	69	93
10.2E	154	199
10.3E	76	158
20E	32	50
30E	129	163
30.1E	68	88
30.2E	61	77
40E	341	391
40.1E	253	374

III. FLOODPLAIN ANALYSIS

Three watercourses are located on the parcel that have 100-year peak discharges of 100 cfs, or greater (i.e. Wash 10, Wash 30 & Wash 40). The 100-year floodplains for these watercourses were developed using the U.S. Army Corps of Engineers HEC-RAS computer model, in conjunction with the 100-year peak discharges documented within Section II of this report. Appendix B of this report provides HEC-RAS reports which summarize the hydraulic parameters associated with the hydraulic cross-sections shown on Figure 3. Table 3.1 of this report provides a summary of the hydraulic parameters associated with the 100-year peak rate of flow on these watercourses.

Wash 40 has also been mapped as a regulatory 100-year floodplain, in conjunction with the Flood Insurance Study (FIS) for Cochise County. The watercourse is mapped as an "Un-numbered Zone A" on Flood Insurance Rate Map (FIRM) Number 0400121253 E, Revised April 2, 2003. Figure 3 of this report provides a delineation of the FEMA floodplain, as well as the more detailed 100-year floodplain limits developed by Arroyo Engineering.

TABLE 3.1
100-YEAR FLOODPLAIN
HYDRAULIC PARAMETERS

SECNO	WSEL	DEPTH (feet)	VELOCITY (fps)
WASH 10			
100	4503.5	1.5	6.9
101	4510.9	0.9	5.3
102	4519.6	1.6	7.1
103	4528.6	0.6	5.1
104	4537.1	1.1	4.7
105	4547.7	1.7	5.7
106	4558.8	0.8	4.9
107	4572.8	0.8	5.1
108	4585.0	1.0	6.4
109	4595.0	1.0	6.6
110	4612.2	0.2	2.5
WASH 30			
300	4520.9	0.9	5.2
301	4526.6	0.6	4.3
WASH 40			
400	4530.6	0.6	4.4
401	4539.7	1.7	4.4
402	4544.6	0.6	4.2
403	4556.8	0.8	3.1
404	4564.5	0.5	3.3
405	4574.7	0.7	2.8

APPENDIX A
HYDROLOGIC CALCULATIONS

Project Name:	**Golden Acres Parcel**
Concentration Point:	**10E**

Drainage Area (acres)	259	
P1 (100-year)	2.45	inches
Lc	8420	feet
delta Y	154	feet
C	0.33	
Slope	1.829	%
Tc	38	min
i	3.4	in/hr
Q=	**290.6**	**cfs**

ARROYO ENGINEERING, LLC

Project Name:	**Golden Acres Parcel**
Concentration Point:	**10.1E**

Drainage Area (acres)	69	
P1 (100-year)	2.45	inches
Lc	4300	feet
delta Y	78	feet
C	0.3	
Slope	1.814	%
Tc	23	min
i	4.5	in/hr
Q=	**93.2**	**cfs**

ARROYO ENGINEERING, LLC

Project Name:	**Golden Acres Parcel**
Concentration Point:	**10.2E**

Drainage Area (acres)	154	
P1 (100-year)	2.45	inches
Lc	6600	feet
delta Y	122	feet
C	0.35	
Slope	1.848	%
Tc	32	min
i	3.7	in/hr
Q=	**199.4**	**cfs**

ARROYO ENGINEERING, LLC

Project Name:	**Golden Acres Parcel**
Concentration Point:	**10.3E**

Drainage Area (acres)	76
P1 (100-year)	2.45 inches
Lc	2900 feet
delta Y	52 feet
C	0.4
Slope	1.793 %
Tc	17 min
i	5.2 in/hr
Q=	**158.1 cfs**

ARROYO ENGINEERING, LLC

Project Name:	**Golden Acres Parcel**
Concentration Point:	**20E**

Drainage Area (acres)	32	
P1 (100-year)	2.45	inches
Lc	2670	feet
delta Y	40	feet
C	0.3	
Slope	1.498	%
Tc	17	min
i	5.2	in/hr
Q=	**49.9**	**cfs**

ARROYO ENGINEERING, LLC

Project Name:	**Golden Acres Parcel**
Concentration Point:	**30E**

Drainage Area (acres)	129	
P1 (100-year)	2.45	inches
Lc	4920	feet
delta Y	88	feet
C	0.3	
Slope	1.789	%
Tc	26	min
i	4.2	in/hr
Q=	**162.5**	**cfs**

ARROYO ENGINEERING, LLC

Project Name:	**Golden Acres Parcel**
Concentration Point:	**30.1E**

Drainage Area (acres)	68	
P1 (100-year)	2.45	inches
Lc	4570	feet
delta Y	78	feet
C	0.3	
Slope	1.707	%
Tc	25	min
i	4.3	in/hr
Q=	**87.7**	**cfs**

ARROYO ENGINEERING, LLC

Project Name:	**Golden Acres Parcel**
Concentration Point:	**30.2E**

Drainage Area (acres)	61
P1 (100-year)	2.45 inches
Lc	4920 feet
delta Y	88 feet
C	0.3
Slope	1.789 %
Tc	26 min
i	4.2 in/hr
Q=	**76.9 cfs**

ARROYO ENGINEERING, LLC

Project Name:	**Golden Acres Parcel**
Concentration Point:	**40E**

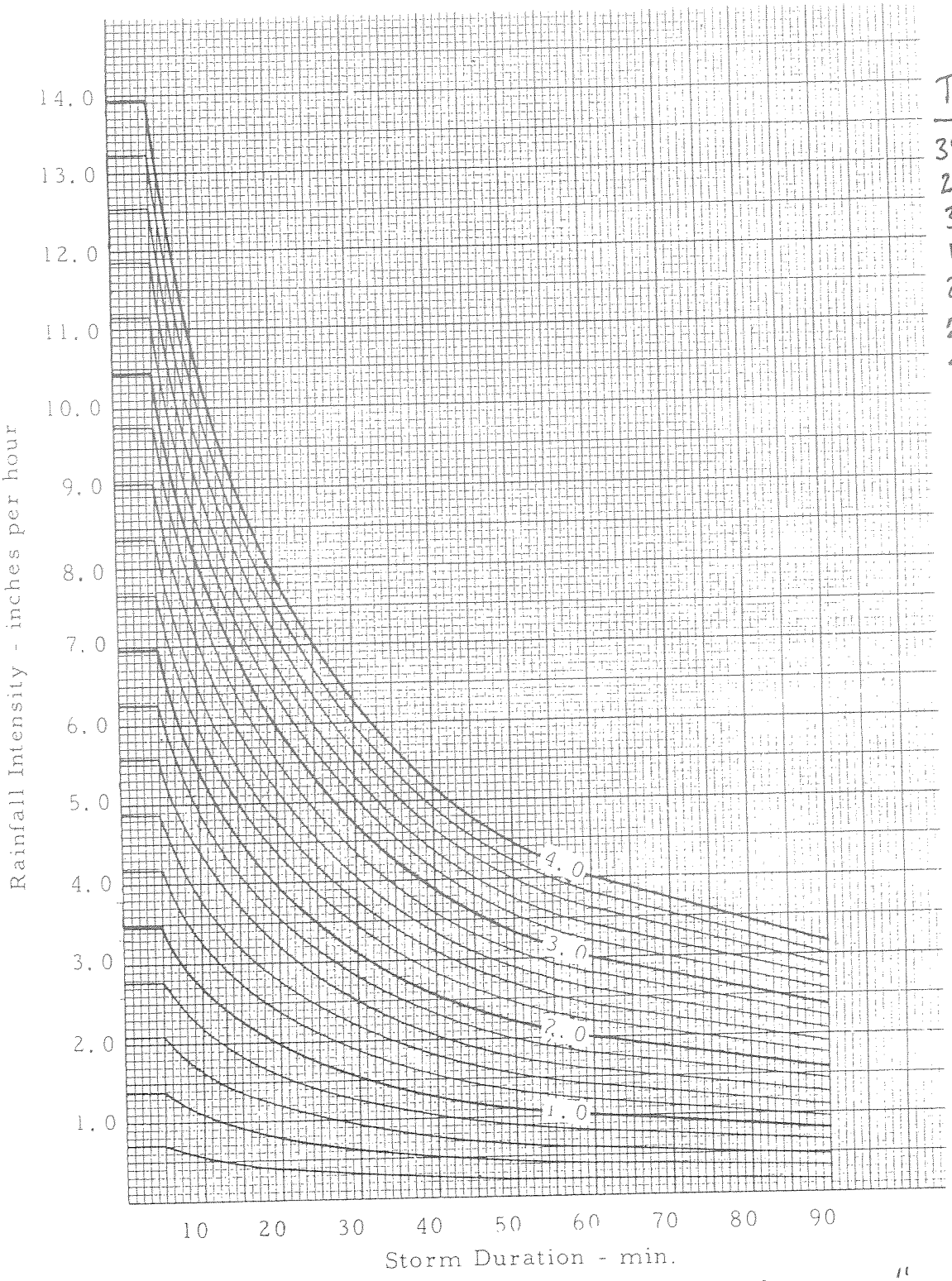
Drainage Area (acres)	341
P1 (100-year)	2.45 inches
Lc	9200 feet
delta Y	160 feet
C	0.37
Slope	1.739 %
Tc	42 min
i	3.1 in/hr
Q=	**391.1 cfs**

ARROYO ENGINEERING, LLC

Project Name:	**Golden Acres Parcel**
Concentration Point:	**40.1E**

Drainage Area (acres)	253
P1 (100-year)	2.45 inches
Lc	6460 feet
delta Y	108 feet
C	0.4
Slope	1.672 %
Tc	32 min
i	3.7 in/hr
Q=	**374.4 cfs**

ARROYO ENGINEERING, LLC



T_c	i
38	3.4
23	4.5
32	3.7
17	5.2
26	4.2
25	4.3
42	3.1

@ $T_c = 10$ min

$I_{100} = 6.7$ in/hr

$I_{10} = 4.7$ in/hr

$P_1^{100} = 2.45''$

$P_1^{10} = 1.72''$

Fig. 3-2

STANDARD DURATION RAINFALL - INTENSITY CURVES

Based on:
Weather Bureau
Technical Paper No. 40

Streets	
Asphaltic	0.70 - 0.95
Concrete	0.80 - 0.95
Gravel roadways & shoulders	0.40 - 0.60
Industrial Areas	
Flat commercial - about 90% of area impervious	0.80
Heavy areas	0.60 - 0.90
Light areas	0.50 - 0.80
Business Areas	
Downtown areas	0.70 - 0.95
Neighborhood areas	0.50 - 0.70
Residential Areas	
Lawns - flat	0.05 - 0.15
- steep	0.15 - 0.35
Suburban areas	0.25 - 0.40
Single family areas	0.30 - 0.50
Multi-unit areas	0.40 - 0.60
Apartment areas	0.50 - 0.70
Parks, Cemeteries	0.10 - 0.25
Playgrounds	0.20 - 0.35

Fig. 3-3

VALUES OF RUNOFF COEFFICIENT C

APPENDIX B
FLOODPLAIN MODELING DATA

HEC-RAS Version 3.0.1 Mar 2001
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

```
X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X        X    X       X   X     X  X    X
X     X  X        X            X   X    X    X   X
XXXXXXX  XXXX     X       XXX  XXXX     XXXXXX    XXXX
X     X  X        X            X  X     X    X        X
X     X  X        X    X       X   X    X    X        X
X     X  XXXXXX    XXXX        X    X   X    X   XXXXX
```

****

PROJECT DATA
Project Title: Golden Acres
Project File : WASH 10.prj
Run Date and Time: 9/13/2005 9:10:23 AM

Project in English units

Project Description:
WASH 10

****

ROYO ENGINEERING, LLC

PLAN DATA

Plan Title: WASH 10
Plan File : C:\Projects\EEC17-GoldenAcres2\HECRAS\WASH 10.P01

Geometry Title: Base Conditions Geometry
Geometry File : C:\Projects\EEC17-GoldenAcres2\HECRAS\WASH 10.G01

Flow Title : 1 Flow Profiles
Flow File : C:\Projects\EEC17-GoldenAcres2\HECRAS\WASH 10.F01

Plan Summary Information:

Number of:	Cross Sections	= 11	Mulitple Openings	=	0
	Culverts	= 0	Inline Weirs	=	0
	Bridges	= 0			

Computational Information

Water surface calculation tolerance	=	0.01
Critical depth calculaton tolerance	=	0.01
Maximum number of interations	=	20
Maximum difference tolerance	=	0.3
Flow tolerance factor	=	0.001

Computation Options

Critical depth computed only where necessary	
Conveyance Calculation Method:	At breaks in n values only
Friction Slope Method:	Average Conveyance
Computational Flow Regime:	Subcritical Flow

ROYO ENGINEERING, LLC

****

FLOW DATA

Flow Title: 1 Flow Profiles
Flow File : C:\Projects\EEC17-GoldenAcres2\HECRAS\WASH 10.F01

Flow Data (cfs)

River	Reach	RS	PF 1
Reach #1	WASH 10	110	154
Reach #1	WASH 10	104	291

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Reach #1	WASH 10	PF 1		Critical

****

ROYO ENGINEERING, LLC

GEOMETRY DATA

Geometry Title: Base Conditions Geometry
Geometry File : C:\Projects\EEC17-GoldenAcres2\HECRAS\WASH 10.G01

CROSS SECTION RIVER: Reach #1
REACH: WASH 10 RS: 110

INPUT
Description:
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	4614	165.91	4612	483.96	4612	689.79	4614

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.045	165.91	.025	483.96	.045

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
165.91	483.96	840.5	864.84	856.96	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	4612.29	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.09	Wt. n-Val.	0.045	0.025	0.045
W.S. Elev (ft)	4612.19	Reach Len. (ft)	840.50	864.84	856.96
Crit W.S. (ft)	4612.19	Flow Area (sq ft)	1.53	61.03	1.89
E.G. Slope (ft/ft)	0.015662	Area (sq ft)	1.53	61.03	1.89
Q Total (cfs)	154.00	Flow (cfs)	1.32	151.04	1.64
Top Width (ft)	353.72	Top Width (ft)	15.92	318.05	19.75
Vel Total (ft/s)	2.39	Avg. Vel. (ft/s)	0.87	2.47	0.87
Max Chl Dpth (ft)	0.19	Hydr. Depth (ft)	0.10	0.19	0.10
Conv. Total (cfs)	1230.5	Conv. (cfs)	10.6	1206.9	13.1
Length Wtd. (ft)	858.47	Wetted Per. (ft)	15.92	318.05	19.75
Min Ch El (ft)	4612.00	Shear (lb/sq ft)	0.09	0.19	0.09

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```
* Alpha                  *    1.05  * Stream Power (lb/ft s) *    0.08  *    0.46  *    0.08  *
* Frctn Loss (ft)        *   12.41  * Cum Volume (acre-ft)   *    1.67  *    4.06  *    1.91  *
* C & E Loss (ft)        *    0.02  * Cum SA (acres)         *    3.68  *    7.32  *    4.29  *
*****************************************************************************************************

Warning: The energy equation could not be balanced within the specified number of iterations.  The
         program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross
         section.  This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to
         critical depth, the calculated water surface came back below critical depth.  This indicates
         that there is not a valid subcritical answer.  The program defaulted to critical depth.

CROSS SECTION          RIVER: Reach #1
REACH: WASH 10            RS: 109

INPUT
Description:
Station Elevation Data    num=      11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
       0    4600   14.57    4600   172.3    4598  294.66    4596  322.66    4596
  364.86    4596  485.62    4594  492.24    4594  588.17    4596  766.48    4598
   962.3    4600

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
       0    .045  485.62    .025  492.24    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.  Expan.
        485.62  492.24            524.75  526.54  567.48            .1        .3

CROSS SECTION OUTPUT    Profile #PF 1
*****************************************************************************************************
* E.G. Elev (ft)         * 4595.19  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.24  * Wt. n-Val.              *   0.045  *   0.025  *   0.045  *
```

W.S. Elev (ft)	4594.95	Reach Len. (ft)	524.75	526.54	567.48	
Crit W.S. (ft)	4594.95	Flow Area (sq ft)	27.03	6.26	21.48	
E.G. Slope (ft/ft)	0.013379	Area (sq ft)	27.03	6.26	21.48	
Q Total (cfs)	154.00	Flow (cfs)	62.69	41.51	49.80	
Top Width (ft)	109.15	Top Width (ft)	57.14	6.62	45.39	
Vel Total (ft/s)	2.81	Avg. Vel. (ft/s)	2.32	6.63	2.32	
Max Chl Dpth (ft)	0.95	Hydr. Depth (ft)	0.47	0.95	0.47	
Conv. Total (cfs)	1331.4	Conv. (cfs)	542.0	358.9	430.5	
Length Wtd. (ft)	533.67	Wetted Per. (ft)	57.14	6.62	45.40	
Min Ch El (ft)	4594.00	Shear (lb/sq ft)	0.40	0.79	0.40	
Alpha	1.99	Stream Power (lb/ft s)	0.92	5.24	0.92	
Frctn Loss (ft)	6.73	Cum Volume (acre-ft)	1.40	3.39	1.68	
C & E Loss (ft)	0.00	Cum SA (acres)	2.98	4.10	3.65	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: Reach #1
REACH: WASH 10 RS: 108

INPUT
Description:
Station Elevation Data num= 12

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	4590	14.8	4590	223.88	4588	273.57	4586	443.24	4584
451.13	4584	470.55	4586	494.51	4586	508.53	4586	688.64	4588
856.79	4590	881.13	4590						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val

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```
************************************************
      0     .045  443.24     .025  451.13     .045

Bank Sta: Left    Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
        443.24  451.13            718.43  736.35  715.96             .1          .3

CROSS SECTION OUTPUT    Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 4585.25  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.26  * Wt. n-Val.              *   0.045  *   0.025  *   0.045  *
* W.S. Elev (ft)         * 4584.99  * Reach Len. (ft)         *  718.43  *  736.35  *  715.96  *
* Crit W.S. (ft)         * 4584.99  * Flow Area (sq ft)       *   41.39  *    7.79  *    4.74  *
* E.G. Slope (ft/ft)     *0.011917  * Area (sq ft)            *   41.39  *    7.79  *    4.74  *
* Q Total (cfs)          *  154.00  * Flow (cfs)              *   93.21  *   50.16  *   10.63  *
* Top Width (ft)         *  101.28  * Top Width (ft)          *   83.80  *    7.89  *    9.59  *
* Vel Total (ft/s)       *    2.86  * Avg. Vel. (ft/s)        *    2.25  *    6.44  *    2.24  *
* Max Chl Dpth (ft)      *    0.99  * Hydr. Depth (ft)        *    0.49  *    0.99  *    0.49  *
* Conv. Total (cfs)      *  1410.7  * Conv. (cfs)             *   853.9  *   459.5  *    97.4  *
* Length Wtd. (ft)       *  725.89  * Wetted Per. (ft)        *   83.81  *    7.89  *    9.64  *
* Min Ch El (ft)         * 4584.00  * Shear (lb/sq ft)        *    0.37  *    0.73  *    0.37  *
* Alpha                  *    2.07  * Stream Power (lb/ft s)  *    0.83  *    4.73  *    0.82  *
* Frctn Loss (ft)        *    7.98  * Cum Volume (acre-ft)    *    0.98  *    3.31  *    1.51  *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)          *    2.13  *    4.01  *    3.29  *
*****************************************************************************************

Warning: The energy equation could not be balanced within the specified number of iterations.  The
         program selected the water surface that had the least amount of error between computed
         and assumed values.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross
         section.  This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to
         critical depth, the calculated water surface came back below critical depth.  This indicates
         that there is not a valid subcritical answer.  The program defaulted to critical depth.

CROSS SECTION          RIVER: Reach #1
REACH: WASH 10            RS: 107
```

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INPUT
Description:
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	4578	209.49	4578	328.44	4576	375.53	4574	419.24	4572
440.84	4572	637.33	4574	751.74	4576	905.9	4578		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.045	419.24	.025	440.84	.045

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
419.24	440.84	742.14	767.52	816.64	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	4573.04	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.25	Wt. n-Val.	0.045	0.025	0.045
W.S. Elev (ft)	4572.79	Reach Len. (ft)	742.14	767.52	816.64
Crit W.S. (ft)	4572.79	Flow Area (sq ft)	6.80	17.03	30.55
E.G. Slope (ft/ft)	0.010170	Area (sq ft)	6.80	17.03	30.55
Q Total (cfs)	154.00	Flow (cfs)	12.16	87.15	54.69
Top Width (ft)	116.31	Top Width (ft)	17.23	21.60	77.47
Vel Total (ft/s)	2.83	Avg. Vel. (ft/s)	1.79	5.12	1.79
Max Chl Dpth (ft)	0.79	Hydr. Depth (ft)	0.39	0.79	0.39
Conv. Total (cfs)	1527.0	Conv. (cfs)	120.6	864.1	542.3
Length Wtd. (ft)	777.93	Wetted Per. (ft)	17.25	21.60	77.48
Min Ch El (ft)	4572.00	Shear (lb/sq ft)	0.25	0.50	0.25
Alpha	2.02	Stream Power (lb/ft s)	0.45	2.56	0.45
Frctn Loss (ft)	7.72	Cum Volume (acre-ft)	0.59	3.10	1.22
C & E Loss (ft)	0.00	Cum SA (acres)	1.29	3.76	2.57

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.

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Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: Reach #1
REACH: WASH 10 RS: 106

INPUT
Description:
Station Elevation Data num= 12

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	4568	42.03	4566	153.13	4564	238.16	4562	268.05	4562
276.86	4562	339	4560	452.45	4558	477.9	4558	604.5	4560
724.41	4562	775.77	4564						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.045	452.45	.025	477.9	.045

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
452.45	477.9	589.38	532.28	480.67	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	4559.01	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.24	Wt. n-Val.	0.045	0.025	0.045
W.S. Elev (ft)	4558.76	Reach Len. (ft)	589.38	532.28	480.67
Crit W.S. (ft)	4558.76	Flow Area (sq ft)	16.46	19.39	18.36
E.G. Slope (ft/ft)	0.009682	Area (sq ft)	16.46	19.39	18.36
Q Total (cfs)	154.00	Flow (cfs)	28.09	94.56	31.35
Top Width (ft)	116.88	Top Width (ft)	43.21	25.45	48.22
Vel Total (ft/s)	2.84	Avg. Vel. (ft/s)	1.71	4.88	1.71
Max Chl Dpth (ft)	0.76	Hydr. Depth (ft)	0.38	0.76	0.38

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* Conv. Total (cfs)	*	1565.1	* Conv. (cfs)	*	285.5	*	961.0	*	318.6	*
* Length Wtd. (ft)	*	532.24	* Wetted Per. (ft)	*	43.22	*	25.45	*	48.22	*
* Min Ch El (ft)	*	4558.00	* Shear (lb/sq ft)	*	0.23	*	0.46	*	0.23	*
* Alpha	*	1.95	* Stream Power (lb/ft s)	*	0.39	*	2.25	*	0.39	*
* Frctn Loss (ft)	*	5.12	* Cum Volume (acre-ft)	*	0.39	*	2.78	*	0.76	*
* C & E Loss (ft)	*	0.03	* Cum SA (acres)	*	0.78	*	3.35	*	1.39	*

****

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: Reach #1
REACH: WASH 10 RS: 105

INPUT
Description:
Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	4558	7.24	4558	66.88	4558	142.35	4558	278.47	4556
301.51	4554	380.82	4552	432.27	4552	438.55	4552	494.83	4550
572.22	4548	583.02	4546	587.56	4546	603.17	4548	754	4550
767.02	4552	817.02	4554	882.57	4556	885.47	4556	903.52	4556
911.88	4556								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.045	572.22	.025	603.17	.045

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
572.22	603.17	481.8	555.52	562.91	.1	.3

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CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	4548.21	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.51	Wt. n-Val.		0.025	
W.S. Elev (ft)	4547.70	Reach Len. (ft)	481.80	555.52	562.91
Crit W.S. (ft)	4547.70	Flow Area (sq ft)		26.82	
E.G. Slope (ft/ft)	0.009541	Area (sq ft)		26.82	
Q Total (cfs)	154.00	Flow (cfs)		154.00	
Top Width (ft)	27.00	Top Width (ft)		27.00	
Vel Total (ft/s)	5.74	Avg. Vel. (ft/s)		5.74	
Max Chl Dpth (ft)	1.70	Hydr. Depth (ft)		0.99	
Conv. Total (cfs)	1576.6	Conv. (cfs)		1576.6	
Length Wtd. (ft)	555.52	Wetted Per. (ft)		27.26	
Min Ch El (ft)	4546.00	Shear (lb/sq ft)		0.59	
Alpha	1.00	Stream Power (lb/ft s)		3.36	
Frctn Loss (ft)	5.68	Cum Volume (acre-ft)	0.28	2.49	0.66
C & E Loss (ft)	0.05	Cum SA (acres)	0.49	3.03	1.13

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: Reach #1
REACH: WASH 10 RS: 104

INPUT
Description:
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

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0	4550	63.93	4548	98.87	4546	136.81	4544	150.72	4544
178.59	4544	212.14	4542	264.38	4540	277.81	4538	382.52	4536
399.36	4536	428.54	4538	622.19	4540	656.41	4542	669.65	4544
682.88	4546	764.02	4548	901.79	4550				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.045	277.81	.025	428.54	.045

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
277.81	428.54	603.83	543.09	472.99	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	4537.48	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.34	Wt. n-Val.		0.025	
W.S. Elev (ft)	4537.13	Reach Len. (ft)	603.83	543.09	472.99
Crit W.S. (ft)	4537.13	Flow Area (sq ft)		62.08	
E.G. Slope (ft/ft)	0.010627	Area (sq ft)		62.08	
Q Total (cfs)	291.00	Flow (cfs)		291.00	
Top Width (ft)	92.71	Top Width (ft)		92.71	
Vel Total (ft/s)	4.69	Avg. Vel. (ft/s)		4.69	
Max Chl Dpth (ft)	1.13	Hydr. Depth (ft)		0.67	
Conv. Total (cfs)	2822.9	Conv. (cfs)		2822.9	
Length Wtd. (ft)	533.82	Wetted Per. (ft)		92.76	
Min Ch El (ft)	4536.00	Shear (lb/sq ft)		0.44	
Alpha	1.00	Stream Power (lb/ft s)		2.08	
Frctn Loss (ft)	6.35	Cum Volume (acre-ft)	0.28	1.93	0.66
C & E Loss (ft)	0.01	Cum SA (acres)	0.49	2.26	1.13

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to

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critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: Reach #1
REACH: WASH 10 RS: 103

INPUT
Description:
Station Elevation Data num= 14

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	4536	37.79	4534	67.95	4532	83.26	4530	115.39	4528
179.16	4528	196.42	4528	223.65	4528	251.83	4530	289.17	4532
337.81	4534	398.76	4536	446.41	4538	467.91	4540		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.045	115.39	.025	179.16	.045

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
115.39	179.16	605.67	526.89	508.05	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	4528.94	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.31	Wt. n-Val.	0.045	0.025	0.045
W.S. Elev (ft)	4528.63	Reach Len. (ft)	605.67	526.89	508.05
Crit W.S. (ft)	4528.63	Flow Area (sq ft)	3.20	40.23	30.87
E.G. Slope (ft/ft)	0.013387	Area (sq ft)	3.20	40.23	30.87
Q Total (cfs)	291.00	Flow (cfs)	5.65	203.50	81.85
Top Width (ft)	127.28	Top Width (ft)	10.13	63.77	53.38
Vel Total (ft/s)	3.92	Avg. Vel. (ft/s)	1.77	5.06	2.65
Max Chl Dpth (ft)	0.63	Hydr. Depth (ft)	0.32	0.63	0.58
Conv. Total (cfs)	2515.1	Conv. (cfs)	48.9	1758.8	707.4
Length Wtd. (ft)	527.37	Wetted Per. (ft)	10.15	63.77	53.40
Min Ch El (ft)	4528.00	Shear (lb/sq ft)	0.26	0.53	0.48

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* Alpha	* 1.30	* Stream Power (lb/ft s)	* 0.47	* 2.67	* 1.28 *
* Frctn Loss (ft)	* 5.17	* Cum Volume (acre-ft)	* 0.26	* 1.29	* 0.49 *
* C & E Loss (ft)	* 0.04	* Cum SA (acres)	* 0.42	* 1.29	* 0.84 *

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: Reach #1
REACH: WASH 10 RS: 102

INPUT
Description:
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	4532	9.3	4530	17	4528	24.58	4526	32.2	4524
42	4522	54.54	4520	67.68	4518	90.36	4518	99.01	4520
108.98	4522	118.82	4524	149.48	4526	176.71	4528	206.13	4530

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.045	67.68	.025	90.36	.045

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
67.68	90.36	504.11	562.35	632.89	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 4520.30	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 0.69	* Wt. n-Val.	* 0.045	* 0.025	* 0.045 *

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W.S. Elev (ft)	4519.61	Reach Len. (ft)	504.11	562.35	632.89	
Crit W.S. (ft)	4519.61	Flow Area (sq ft)	8.46	36.40	5.57	
E.G. Slope (ft/ft)	0.007494	Area (sq ft)	8.46	36.40	5.57	
Q Total (cfs)	291.00	Flow (cfs)	20.73	256.76	13.51	
Top Width (ft)	40.17	Top Width (ft)	10.54	22.68	6.94	
Vel Total (ft/s)	5.77	Avg. Vel. (ft/s)	2.45	7.05	2.43	
Max Chl Dpth (ft)	1.60	Hydr. Depth (ft)	0.80	1.60	0.80	
Conv. Total (cfs)	3361.4	Conv. (cfs)	239.5	2965.8	156.1	
Length Wtd. (ft)	563.56	Wetted Per. (ft)	10.67	22.68	7.12	
Min Ch El (ft)	4518.00	Shear (lb/sq ft)	0.37	0.75	0.37	
Alpha	1.34	Stream Power (lb/ft s)	0.91	5.30	0.89	
Frctn Loss (ft)	4.68	Cum Volume (acre-ft)	0.17	0.83	0.28	
C & E Loss (ft)	0.09	Cum SA (acres)	0.27	0.77	0.49	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: Reach #1
REACH: WASH 10 RS: 101

INPUT
Description:
Station Elevation Data num= 12

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	4520	52.07	4518	129.45	4516	136.73	4514	143.89	4512
170.05	4510	224.62	4510	282.71	4512	326.36	4514	342.54	4516
353.75	4518	366.29	4520						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val

```
************************************************
       0     .045  170.05     .025  224.62     .045

Bank Sta: Left    Right     Lengths: Left Channel   Right      Coeff Contr.    Expan.
        170.05  224.62              313.28  326.71  336.19            .1          .3

CROSS SECTION OUTPUT     Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 4511.29  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.40  * Wt. n-Val.              *   0.045  *   0.025  *   0.045  *
* W.S. Elev (ft)          * 4510.90  * Reach Len. (ft)         *  313.28  *  326.71  *  336.19  *
* Crit W.S. (ft)          * 4510.90  * Flow Area (sq ft)       *    5.24  *   48.87  *   11.65  *
* E.G. Slope (ft/ft)      *0.009256  * Area (sq ft)            *    5.24  *   48.87  *   11.65  *
* Q Total (cfs)           *  291.00  * Flow (cfs)              *    9.73  *  259.62  *   21.65  *
* Top Width (ft)          *   92.29  * Top Width (ft)           *   11.71  *   54.57  *   26.01  *
* Vel Total (ft/s)        *    4.43  * Avg. Vel. (ft/s)         *    1.86  *    5.31  *    1.86  *
* Max Chl Dpth (ft)       *    0.90  * Hydr. Depth (ft)         *    0.45  *    0.90  *    0.45  *
* Conv. Total (cfs)       *  3024.7  * Conv. (cfs)              *   101.2  *  2698.5  *   225.0  *
* Length Wtd. (ft)        *  326.77  * Wetted Per. (ft)         *   11.75  *   54.57  *   26.03  *
* Min Ch El (ft)          * 4510.00  * Shear (lb/sq ft)         *    0.26  *    0.52  *    0.26  *
* Alpha                   *    1.30  * Stream Power (lb/ft s)   *    0.48  *    2.75  *    0.48  *
* Frctn Loss (ft)         *    2.81  * Cum Volume (acre-ft)     *    0.09  *    0.28  *    0.15  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)           *    0.14  *    0.27  *    0.25  *
*****************************************************************************************

Warning: The energy equation could not be balanced within the specified number of iterations.  The
         program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross
         section.  This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to
         critical depth, the calculated water surface came back below critical depth.  This indicates
         that there is not a valid subcritical answer.  The program defaulted to critical depth.

CROSS SECTION            RIVER: Reach #1
REACH: WASH 10              RS: 100

INPUT
```

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Description:

Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	4510	43.45	4508	65.59	4506	89.44	4504	127.73	4502
144.45	4502	195.41	4504	247.02	4506	262.88	4508	272.13	4510
281.29	4512	290.16	4514	300.73	4516	318.75	4518	336.83	4520
365.09	4522								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.045	127.73	.025	144.45	.045

Bank Sta: Left	Right	Coeff Contr.	Expan.
127.73	144.45	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

				Left OB	Channel	Right OB
E.G. Elev (ft)	4503.96	Element				
Vel Head (ft)	0.48	Wt. n-Val.		0.045	0.025	0.045
W.S. Elev (ft)	4503.49	Reach Len. (ft)				
Crit W.S. (ft)	4503.49	Flow Area (sq ft)		21.13	24.84	28.13
E.G. Slope (ft/ft)	0.007987	Area (sq ft)		21.13	24.84	28.13
Q Total (cfs)	291.00	Flow (cfs)		51.11	171.84	68.05
Top Width (ft)	83.03	Top Width (ft)		28.45	16.72	37.86
Vel Total (ft/s)	3.93	Avg. Vel. (ft/s)		2.42	6.92	2.42
Max Chl Dpth (ft)	1.49	Hydr. Depth (ft)		0.74	1.49	0.74
Conv. Total (cfs)	3256.0	Conv. (cfs)		571.9	1922.7	761.4
Length Wtd. (ft)		Wetted Per. (ft)		28.49	16.72	37.89
Min Ch El (ft)	4502.00	Shear (lb/sq ft)		0.37	0.74	0.37
Alpha	1.99	Stream Power (lb/ft s)		0.89	5.12	0.90
Frctn Loss (ft)		Cum Volume (acre-ft)				
C & E Loss (ft)		Cum SA (acres)				

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SUMMARY OF MANNING'S N VALUES

River:Reach #1

Reach	River Sta.	n1	n2	n3
WASH 10	110	.045	.025	.045
WASH 10	109	.045	.025	.045
WASH 10	108	.045	.025	.045
WASH 10	107	.045	.025	.045
WASH 10	106	.045	.025	.045
WASH 10	105	.045	.025	.045
WASH 10	104	.045	.025	.045
WASH 10	103	.045	.025	.045
WASH 10	102	.045	.025	.045
WASH 10	101	.045	.025	.045
WASH 10	100	.045	.025	.045

SUMMARY OF REACH LENGTHS

River: Reach #1

Reach	River Sta.	Left	Channel	Right
WASH 10	110	840.5	864.84	856.96
WASH 10	109	524.75	526.54	567.48
WASH 10	108	718.43	736.35	715.96
WASH 10	107	742.14	767.52	816.64
WASH 10	106	589.38	532.28	480.67
WASH 10	105	481.8	555.52	562.91
WASH 10	104	603.83	543.09	472.99
WASH 10	103	605.67	526.89	508.05
WASH 10	102	504.11	562.35	632.89
WASH 10	101	313.28	326.71	336.19

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*WASH 10          *    100          *          *          *          *
*************************************************************

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SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Reach #1

*******************************************************
*     Reach       *   River Sta.   * Contr.  * Expan.  *
*******************************************************
*WASH 10          *    110     *       .1*       .3*
*WASH 10          *    109     *       .1*       .3*
*WASH 10          *    108     *       .1*       .3*
*WASH 10          *    107     *       .1*       .3*
*WASH 10          *    106     *       .1*       .3*
*WASH 10          *    105     *       .1*       .3*
*WASH 10          *    104     *       .1*       .3*
*WASH 10          *    103     *       .1*       .3*
*WASH 10          *    102     *       .1*       .3*
*WASH 10          *    101     *       .1*       .3*
*WASH 10          *    100     *       .1*       .3*
*******************************************************
```

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Profile Output Table - Standard Table 1

Reach	River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
WASH 10	110	154.00	4612.00	4612.19	4612.19	4612.29	0.015662	2.47	64.45	353.72	1.00
WASH 10	109	154.00	4594.00	4594.95	4594.95	4595.19	0.013379	6.63	54.77	109.15	1.20
WASH 10	108	154.00	4584.00	4584.99	4584.99	4585.25	0.011917	6.44	53.92	101.28	1.14
WASH 10	107	154.00	4572.00	4572.79	4572.79	4573.04	0.010170	5.12	54.38	116.31	1.02
WASH 10	106	154.00	4558.00	4558.76	4558.76	4559.01	0.009682	4.88	54.21	116.88	0.98
WASH 10	105	154.00	4546.00	4547.70	4547.70	4548.21	0.009541	5.74	26.82	27.00	1.02
WASH 10	104	291.00	4536.00	4537.13	4537.13	4537.48	0.010627	4.69	62.08	92.71	1.01
WASH 10	103	291.00	4528.00	4528.63	4528.63	4528.94	0.013387	5.06	74.30	127.28	1.12
WASH 10	102	291.00	4518.00	4519.61	4519.61	4520.30	0.007494	7.05	50.43	40.17	0.98
WASH 10	101	291.00	4510.00	4510.90	4510.90	4511.29	0.009256	5.31	65.76	92.29	0.99
WASH 10	100	291.00	4502.00	4503.49	4503.49	4503.96	0.007987	6.92	74.10	83.03	1.00

Profile Output Table - Standard Table 2

Reach	River Sta	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
WASH 10	110	4612.29	4612.19	0.09	12.41	0.02	1.32	151.04	1.64	353.72
WASH 10	109	4595.19	4594.95	0.24	6.73	0.00	62.69	41.51	49.80	109.15
WASH 10	108	4585.25	4584.99	0.26	7.98	0.00	93.21	50.16	10.63	101.28
WASH 10	107	4573.04	4572.79	0.25	7.72	0.00	12.16	87.15	54.69	116.31
WASH 10	106	4559.01	4558.76	0.24	5.12	0.03	28.09	94.56	31.35	116.88
WASH 10	105	4548.21	4547.70	0.51	5.68	0.05		154.00		27.00
WASH 10	104	4537.48	4537.13	0.34	6.35	0.01		291.00		92.71
WASH 10	103	4528.94	4528.63	0.31	5.17	0.04	5.65	203.50	81.85	127.28
WASH 10	102	4520.30	4519.61	0.69	4.68	0.09	20.73	256.76	13.51	40.17
WASH 10	101	4511.29	4510.90	0.40	2.81	0.01	9.73	259.62	21.65	92.29
WASH 10	100	4503.96	4503.49	0.48			51.11	171.84	68.05	83.03

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HEC-RAS Version 3.0.1 Mar 2001
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

```
X     X  XXXXXX    XXXX        XXXX        XX      XXXX
X     X  X        X    X       X   X      X  X    X
X     X  X        X            X   X     X    X   X
XXXXXXX  XXXX     X       XXX  XXXX     XXXXXX    XXXX
X     X  X        X            X  X      X    X        X
X     X  X        X    X       X   X     X    X        X
X     X  XXXXXX    XXXX        X    X    X    X   XXXXX
```

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PROJECT DATA
Project Title: No title
Project File : WASH30.prj
Run Date and Time: 9/13/2005 9:12:52 AM

Project in English units

****

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PLAN DATA

Plan Title:
Plan File : C:\Projects\EEC17-GoldenAcres2\HECRAS\WASH30.P01

Geometry Title: Base Conditions Geometry
Geometry File : C:\Projects\EEC17-GoldenAcres2\HECRAS\WASH30.G01

Flow Title : 0 Flow Profiles
Flow File : C:\Projects\EEC17-GoldenAcres2\HECRAS\WASH30.F01

Plan Summary Information:

Number of:	Cross Sections =	2	Mulitple Openings =	0
	Culverts =	0	Inline Weirs =	0
	Bridges =	0		

Computational Information

Water surface calculation tolerance =	0.01
Critical depth calculaton tolerance =	0.01
Maximum number of interations =	20
Maximum difference tolerance =	0.3
Flow tolerance factor =	0.001

Computation Options

Critical depth computed only where necessary	
Conveyance Calculation Method:	At breaks in n values only
Friction Slope Method:	Average Conveyance
Computational Flow Regime:	Subcritical Flow

****

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FLOW DATA

Flow Title: 0 Flow Profiles
Flow File : C:\Projects\EEC17-GoldenAcres2\HECRAS\WASH30.F01

Flow Data (cfs)

River	Reach	RS	PF 1
Reach #30	Reach #30	301	163

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Reach #30	Reach #30	PF 1		Critical

GEOMETRY DATA

Geometry Title: Base Conditions Geometry
Geometry File : C:\Projects\EEC17-GoldenAcres2\HECRAS\WASH30.G01

CROSS SECTION RIVER: Reach #30
REACH: Reach #30 RS: 301

INPUT
Description:
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	4532	118.45	4530	179.99	4528	205.67	4526	266.13	4526
291.2	4528	311.5	4530	486.11	4532				

Manning's n Values num= 3

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Sta	n Val	Sta	n Val	Sta	n Val
0	.045	205.67	.03	266.13	.045

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
205.67	266.13	288.84	284.11	284	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	4526.87	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.28	Wt. n-Val.	0.045	0.030	0.045
W.S. Elev (ft)	4526.59	Reach Len. (ft)	288.84	284.11	284.00
Crit W.S. (ft)	4526.59	Flow Area (sq ft)	2.27	35.93	2.21
E.G. Slope (ft/ft)	0.015167	Area (sq ft)	2.27	35.93	2.21
Q Total (cfs)	163.00	Flow (cfs)	4.10	154.90	4.00
Top Width (ft)	75.54	Top Width (ft)	7.63	60.46	7.45
Vel Total (ft/s)	4.03	Avg. Vel. (ft/s)	1.81	4.31	1.81
Max Chl Dpth (ft)	0.59	Hydr. Depth (ft)	0.30	0.59	0.30
Conv. Total (cfs)	1323.5	Conv. (cfs)	33.3	1257.8	32.5
Length Wtd. (ft)	284.29	Wetted Per. (ft)	7.65	60.46	7.47
Min Ch El (ft)	4526.00	Shear (lb/sq ft)	0.28	0.56	0.28
Alpha	1.10	Stream Power (lb/ft s)	0.51	2.43	0.51
Frctn Loss (ft)	4.01	Cum Volume (acre-ft)	0.02	0.21	0.02
C & E Loss (ft)	0.01	Cum SA (acres)	0.06	0.30	0.05

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: Reach #30
REACH: Reach #30 RS: 300

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INPUT
Description:
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	4526	8.53	4526	30.41	4524	52.04	4522	72.49	4520
104.54	4520	121.19	4522	137.84	4524	154.49	4526		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.045	72.49	.03	104.54	.045

Bank Sta: Left	Right	Coeff Contr.	Expan.
72.49	104.54	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	4521.27	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.39	Wt. n-Val.	0.045	0.030	0.045
W.S. Elev (ft)	4520.88	Reach Len. (ft)			
Crit W.S. (ft)	4520.88	Flow Area (sq ft)	3.97	28.23	3.23
E.G. Slope (ft/ft)	0.013140	Area (sq ft)	3.97	28.23	3.23
Q Total (cfs)	163.00	Flow (cfs)	8.66	147.29	7.04
Top Width (ft)	48.39	Top Width (ft)	9.01	32.05	7.33
Vel Total (ft/s)	4.60	Avg. Vel. (ft/s)	2.18	5.22	2.18
Max Chl Dpth (ft)	0.88	Hydr. Depth (ft)	0.44	0.88	0.44
Conv. Total (cfs)	1422.0	Conv. (cfs)	75.6	1284.9	61.4
Length Wtd. (ft)		Wetted Per. (ft)	9.05	32.05	7.39
Min Ch El (ft)	4520.00	Shear (lb/sq ft)	0.36	0.72	0.36
Alpha	1.18	Stream Power (lb/ft s)	0.79	3.77	0.78
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

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SUMMARY OF MANNING'S N VALUES

River:Reach #30

Reach	River Sta.	n1	n2	n3
Reach #30	301	.045	.03	.045
Reach #30	300	.045	.03	.045

SUMMARY OF REACH LENGTHS

River: Reach #30

Reach	River Sta.	Left	Channel	Right
Reach #30	301	288.84	284.11	284
Reach #30	300			

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Reach #30

Reach	River Sta.	Contr.	Expan.
Reach #30	301	.1	.3
Reach #30	300	.1	.3

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Profile Output Table - Standard Table 1

Reach	River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach #30	301	163.00	4526.00	4526.59	4526.59	4526.87	0.015167	4.31	40.41	75.54	0.99
Reach #30	300	163.00	4520.00	4520.88	4520.88	4521.27	0.013140	5.22	35.43	48.39	0.98

Profile Output Table - Standard Table 2

Reach	River Sta	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Reach #30	301	4526.87	4526.59	0.28	4.01	0.01	4.10	154.90	4.00	75.54
Reach #30	300	4521.27	4520.88	0.39			8.66	147.29	7.04	48.39

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HEC-RAS Version 3.0.1 Mar 2001
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

```
X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X        X    X       X   X     X  X    X
X     X  X        X            X   X    X    X   X
XXXXXXX  XXXX     X       XXX  XXXX     XXXXXX    XXXX
X     X  X        X            X  X     X    X        X
X     X  X        X    X       X   X    X    X        X
X     X  XXXXXX    XXXX        X    X   X    X   XXXXX
```

****

PROJECT DATA
Project Title: Golden Acres
Project File : WASH40.prj
Run Date and Time: 9/13/2005 9:13:23 AM

Project in English units

Project Description:
Wash 40

****

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PLAN DATA

Plan Title: Wash 40
Plan File : C:\Projects\EEC17-GoldenAcres2\HECRAS\WASH40.P01

Geometry Title: Base Conditions Geometry
Geometry File : C:\Projects\EEC17-GoldenAcres2\HECRAS\WASH40.G01

Flow Title : 1 Flow Profiles
Flow File : C:\Projects\EEC17-GoldenAcres2\HECRAS\WASH40.F01

Plan Summary Information:

Number of:	Cross Sections	= 6	Mulitple Openings	=	0
	Culverts	= 0	Inline Weirs	=	0
	Bridges	= 0			

Computational Information

Water surface calculation tolerance	= 0.01
Critical depth calculaton tolerance	= 0.01
Maximum number of interations	= 20
Maximum difference tolerance	= 0.3
Flow tolerance factor	= 0.001

Computation Options

Critical depth computed only where necessary	
Conveyance Calculation Method:	At breaks in n values only
Friction Slope Method:	Average Conveyance
Computational Flow Regime:	Subcritical Flow

****

FLOW DATA

Flow Title: 1 Flow Profiles
Flow File : C:\Projects\EEC17-GoldenAcres2\HECRAS\WASH40.F01

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Flow Data (cfs)

River	Reach	RS	PF 1
Reach #4	Wash 40	405	391

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Reach #4	Wash 40	PF 1		Critical

GEOMETRY DATA

Geometry Title: Base Conditions Geometry
Geometry File : C:\Projects\EEC17-GoldenAcres2\HECRAS\WASH40.G01

CROSS SECTION RIVER: Reach #4
REACH: Wash 40 RS: 405

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	4576	66.29	4576	271.51	4574	421.9	4574	635.44	4576

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.045	271.51	.045	421.9	.045

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
271.51	421.9	625.64	638.33	600.21	.1	.3

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CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	4574.81	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.11	Wt. n-Val.	0.045	0.045	0.045
W.S. Elev (ft)	4574.70	Reach Len. (ft)	625.64	638.33	600.21
Crit W.S. (ft)	4574.53	Flow Area (sq ft)	25.33	105.67	26.36
E.G. Slope (ft/ft)	0.011748	Area (sq ft)	25.33	105.67	26.36
Q Total (cfs)	391.00	Flow (cfs)	45.13	298.90	46.96
Top Width (ft)	297.51	Top Width (ft)	72.10	150.39	75.02
Vel Total (ft/s)	2.48	Avg. Vel. (ft/s)	1.78	2.83	1.78
Max Chl Dpth (ft)	0.70	Hydr. Depth (ft)	0.35	0.70	0.35
Conv. Total (cfs)	3607.4	Conv. (cfs)	416.4	2757.7	433.3
Length Wtd. (ft)	633.89	Wetted Per. (ft)	72.10	150.39	75.02
Min Ch El (ft)	4574.00	Shear (lb/sq ft)	0.26	0.52	0.26
Alpha	1.11	Stream Power (lb/ft s)	0.46	1.46	0.46
Frctn Loss (ft)	10.10	Cum Volume (acre-ft)	1.12	5.36	0.78
C & E Loss (ft)	0.00	Cum SA (acres)	3.00	8.10	1.65

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION RIVER: Reach #4
REACH: Wash 40 RS: 404

INPUT
Description:
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	4566	47.61	4566	297.95	4564	486.24	4564	594.62	4566
867.25	4566	1008.31	4566						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.045	297.95	.045	486.24	.045

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Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
297.95	486.24	507.7	491.54	354.89	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	4564.70	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.16	Wt. n-Val.	0.045	0.045	0.045
W.S. Elev (ft)	4564.54	Reach Len. (ft)	507.70	491.54	354.89
Crit W.S. (ft)	4564.48	Flow Area (sq ft)	18.25	101.68	7.90
E.G. Slope (ft/ft)	0.022836	Area (sq ft)	18.25	101.68	7.90
Q Total (cfs)	391.00	Flow (cfs)	38.05	336.48	16.47
Top Width (ft)	285.15	Top Width (ft)	67.60	188.29	29.26
Vel Total (ft/s)	3.06	Avg. Vel. (ft/s)	2.08	3.31	2.08
Max Chl Dpth (ft)	0.54	Hydr. Depth (ft)	0.27	0.54	0.27
Conv. Total (cfs)	2587.4	Conv. (cfs)	251.8	2226.6	109.0
Length Wtd. (ft)	488.98	Wetted Per. (ft)	67.60	188.29	29.27
Min Ch El (ft)	4564.00	Shear (lb/sq ft)	0.38	0.77	0.38
Alpha	1.07	Stream Power (lb/ft s)	0.80	2.55	0.80
Frctn Loss (ft)	7.77	Cum Volume (acre-ft)	0.81	3.84	0.54
C & E Loss (ft)	0.01	Cum SA (acres)	2.00	5.61	0.94

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION RIVER: Reach #4
REACH: Wash 40 RS: 403

INPUT
Description:
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	4558	250.55	4556	376.71	4556	415.27	4558	444.72	4558
481.2	4558	733.59	4560	738.09	4560	810.46	4560		

Manning's n Values num= 3

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Sta	n Val	Sta	n Val	Sta	n Val
0	.045	250.55	.045	376.71	.045

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
250.55	376.71	512.05	655.06	672.81	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	4556.92	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.13	Wt. n-Val.	0.045	0.045	0.045
W.S. Elev (ft)	4556.79	Reach Len. (ft)	512.05	655.06	672.81
Crit W.S. (ft)	4556.60	Flow Area (sq ft)	39.10	99.67	6.02
E.G. Slope (ft/ft)	0.011702	Area (sq ft)	39.10	99.67	6.02
Q Total (cfs)	391.00	Flow (cfs)	75.18	304.26	11.56
Top Width (ft)	240.36	Top Width (ft)	98.97	126.16	15.23
Vel Total (ft/s)	2.70	Avg. Vel. (ft/s)	1.92	3.05	1.92
Max Chl Dpth (ft)	0.79	Hydr. Depth (ft)	0.40	0.79	0.40
Conv. Total (cfs)	3614.5	Conv. (cfs)	695.0	2812.7	106.9
Length Wtd. (ft)	640.28	Wetted Per. (ft)	98.98	126.16	15.25
Min Ch El (ft)	4556.00	Shear (lb/sq ft)	0.29	0.58	0.29
Alpha	1.11	Stream Power (lb/ft s)	0.55	1.76	0.55
Frctn Loss (ft)	12.09	Cum Volume (acre-ft)	0.48	2.71	0.49
C & E Loss (ft)	0.01	Cum SA (acres)	1.03	3.84	0.75

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION RIVER: Reach #4
REACH: Wash 40 RS: 402

INPUT
Description:
Station Elevation Data num= 9

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Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	4550	282.01	4548	310.54	4546	351.75	4544	514.73	4544
560.01	4546	614.05	4548	726.15	4550	943.8	4552		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.045	351.75	.045	514.73	.045

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
351.75	514.73	272.59	259.12	279.75	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	4544.81	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.26	Wt. n-Val.	0.045	0.045	0.045
W.S. Elev (ft)	4544.55	Reach Len. (ft)	272.59	259.12	279.75
Crit W.S. (ft)	4544.55	Flow Area (sq ft)	3.11	89.61	3.42
E.G. Slope (ft/ft)	0.035440	Area (sq ft)	3.11	89.61	3.42
Q Total (cfs)	391.00	Flow (cfs)	8.18	373.83	8.99
Top Width (ft)	186.76	Top Width (ft)	11.33	162.98	12.45
Vel Total (ft/s)	4.07	Avg. Vel. (ft/s)	2.63	4.17	2.63
Max Chl Dpth (ft)	0.55	Hydr. Depth (ft)	0.27	0.55	0.27
Conv. Total (cfs)	2077.0	Conv. (cfs)	43.4	1985.8	47.7
Length Wtd. (ft)	263.35	Wetted Per. (ft)	11.34	162.98	12.46
Min Ch El (ft)	4544.00	Shear (lb/sq ft)	0.61	1.22	0.61
Alpha	1.02	Stream Power (lb/ft s)	1.60	5.07	1.60
Frctn Loss (ft)	4.26	Cum Volume (acre-ft)	0.23	1.28	0.41
C & E Loss (ft)	0.01	Cum SA (acres)	0.38	1.67	0.54

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross

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section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: Reach #4
REACH: Wash 40 RS: 401

INPUT
Description:
Station Elevation Data num= 12

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	4544	129.08	4542	160.14	4542	218.54	4542	243.11	4540
272.39	4538	303.17	4538	360.62	4540	409.6	4542	468.94	4544
508.26	4546	692.85	4548						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.045	272.39	.045	303.17	.045

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
272.39	303.17	510.49	558.5	599.39	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	4539.88	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.23	Wt. n-Val.	0.045	0.045	0.045
W.S. Elev (ft)	4539.65	Reach Len. (ft)	510.49	558.50	599.39
Crit W.S. (ft)	4539.31	Flow Area (sq ft)	20.02	50.90	39.28
E.G. Slope (ft/ft)	0.009209	Area (sq ft)	20.02	50.90	39.28
Q Total (cfs)	391.00	Flow (cfs)	55.80	225.58	109.62
Top Width (ft)	102.50	Top Width (ft)	24.21	30.78	47.51
Vel Total (ft/s)	3.55	Avg. Vel. (ft/s)	2.79	4.43	2.79
Max Chl Dpth (ft)	1.65	Hydr. Depth (ft)	0.83	1.65	0.83
Conv. Total (cfs)	4074.5	Conv. (cfs)	581.5	2350.7	1142.3

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* Length Wtd. (ft)	* 559.83	* Wetted Per. (ft)	* 24.27	* 30.78	* 47.53	*
* Min Ch El (ft)	* 4538.00	* Shear (lb/sq ft)	* 0.47	* 0.95	* 0.48	*
* Alpha	* 1.16	* Stream Power (lb/ft s)	* 1.32	* 4.21	* 1.33	*
* Frctn Loss (ft)	* 8.98	* Cum Volume (acre-ft)	* 0.16	* 0.87	* 0.28	*
* C & E Loss (ft)	* 0.01	* Cum SA (acres)	* 0.27	* 1.09	* 0.35	*

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION RIVER: Reach #4
REACH: Wash 40 RS: 400

INPUT
Description:
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	4536	18.75	4534	49.57	4532	121.24	4530	260.42	4530
270.71	4532	286.79	4534	448.25	4536				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.045	121.24	.045	260.42	.045

Bank Sta: Left	Right	Coeff Contr.	Expan.
121.24	260.42	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 4530.90	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (ft)	* 0.29	* Wt. n-Val.	* 0.045	* 0.045	* 0.045	*
* W.S. Elev (ft)	* 4530.61	* Reach Len. (ft)	*	*	*	*
* Crit W.S. (ft)	* 4530.61	* Flow Area (sq ft)	* 6.56	* 84.20	* 0.94	*

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E.G. Slope (ft/ft)	0.034660	Area (sq ft)	6.56	84.20	0.94
Q Total (cfs)	391.00	Flow (cfs)	18.16	370.26	2.58
Top Width (ft)	163.97	Top Width (ft)	21.68	139.18	3.11
Vel Total (ft/s)	4.26	Avg. Vel. (ft/s)	2.77	4.40	2.74
Max Chl Dpth (ft)	0.60	Hydr. Depth (ft)	0.30	0.60	0.30
Conv. Total (cfs)	2100.2	Conv. (cfs)	97.6	1988.8	13.8
Length Wtd. (ft)		Wetted Per. (ft)	21.69	139.18	3.17
Min Ch El (ft)	4530.00	Shear (lb/sq ft)	0.65	1.31	0.64
Alpha	1.03	Stream Power (lb/ft s)	1.81	5.76	1.76
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

SUMMARY OF MANNING'S N VALUES

River:Reach #4

Reach	River Sta.	n1	n2	n3
Wash 40	405	.045	.045	.045
Wash 40	404	.045	.045	.045
Wash 40	403	.045	.045	.045
Wash 40	402	.045	.045	.045
Wash 40	401	.045	.045	.045
Wash 40	400	.045	.045	.045

SUMMARY OF REACH LENGTHS

River: Reach #4

Reach	River Sta.	Left	Channel	Right

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*Wash 40	*	405	* 625.64*	638.33*	600.21*
*Wash 40	*	404	* 507.7*	491.54*	354.89*
*Wash 40	*	403	* 512.05*	655.06*	672.81*
*Wash 40	*	402	* 272.59*	259.12*	279.75*
*Wash 40	*	401	* 510.49*	558.5*	599.39*
*Wash 40	*	400	* *	*	*

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Reach #4

* Reach	*	River Sta.	* Contr.	* Expan.	*
*Wash 40	*	405	* .1*	.3*	
*Wash 40	*	404	* .1*	.3*	
*Wash 40	*	403	* .1*	.3*	
*Wash 40	*	402	* .1*	.3*	
*Wash 40	*	401	* .1*	.3*	
*Wash 40	*	400	* .1*	.3*	

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Profile Output Table - Standard Table 1

Reach	River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Wash 40	405	391.00	4574.00	4574.70	4574.53	4574.81	0.011748	2.83	157.35	297.51	0.59
Wash 40	404	391.00	4564.00	4564.54	4564.48	4564.70	0.022836	3.31	127.84	285.15	0.79
Wash 40	403	391.00	4556.00	4556.79	4556.60	4556.92	0.011702	3.05	144.78	240.36	0.61
Wash 40	402	391.00	4544.00	4544.55	4544.55	4544.81	0.035440	4.17	96.14	186.76	0.99
Wash 40	401	391.00	4538.00	4539.65	4539.31	4539.88	0.009209	4.43	110.21	102.50	0.61
Wash 40	400	391.00	4530.00	4530.61	4530.61	4530.90	0.034660	4.40	91.70	163.97	1.00

Profile Output Table - Standard Table 2

Reach	River Sta	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Wash 40	405	4574.81	4574.70	0.11	10.10	0.00	45.13	298.90	46.96	297.51
Wash 40	404	4564.70	4564.54	0.16	7.77	0.01	38.05	336.48	16.47	285.15
Wash 40	403	4556.92	4556.79	0.13	12.09	0.01	75.18	304.26	11.56	240.36
Wash 40	402	4544.81	4544.55	0.26	4.26	0.01	8.18	373.83	8.99	186.76
Wash 40	401	4539.88	4539.65	0.23	8.98	0.01	55.80	225.58	109.62	102.50
Wash 40	400	4530.90	4530.61	0.29			18.16	370.26	2.58	163.97

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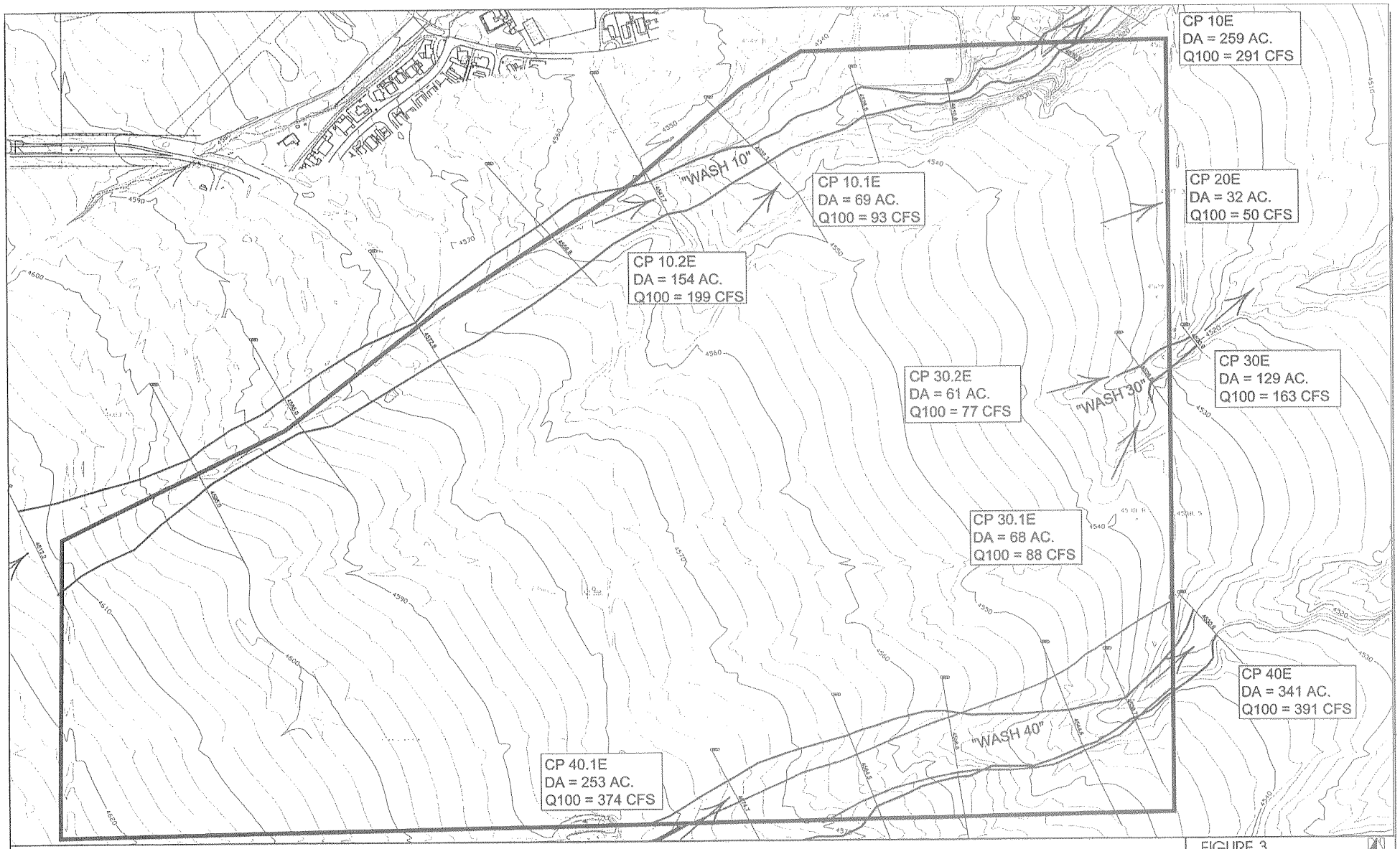

LEGEND

FLOW DIRECTION

PARCEL BOUNDARY

100-YEAR FLOODPLAIN

FEMA ZONE A

CROSS-SECTION & 100-YR WSEL

FIGURE 3

1" = 200'

GOLDEN ACRES PARCEL
EXISTING FLOODPLAIN MAP

ARROYO ENGINEERING, LLC
Water Resources & Civil Engineering Consultants

9/13/2005

APPENDIX D:
Jurisdictional Delineation Report

Jurisdictional Delineation
For
Golden Acres
Cochise County, Arizona
December 2005

Prepared By:
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On Behalf of:
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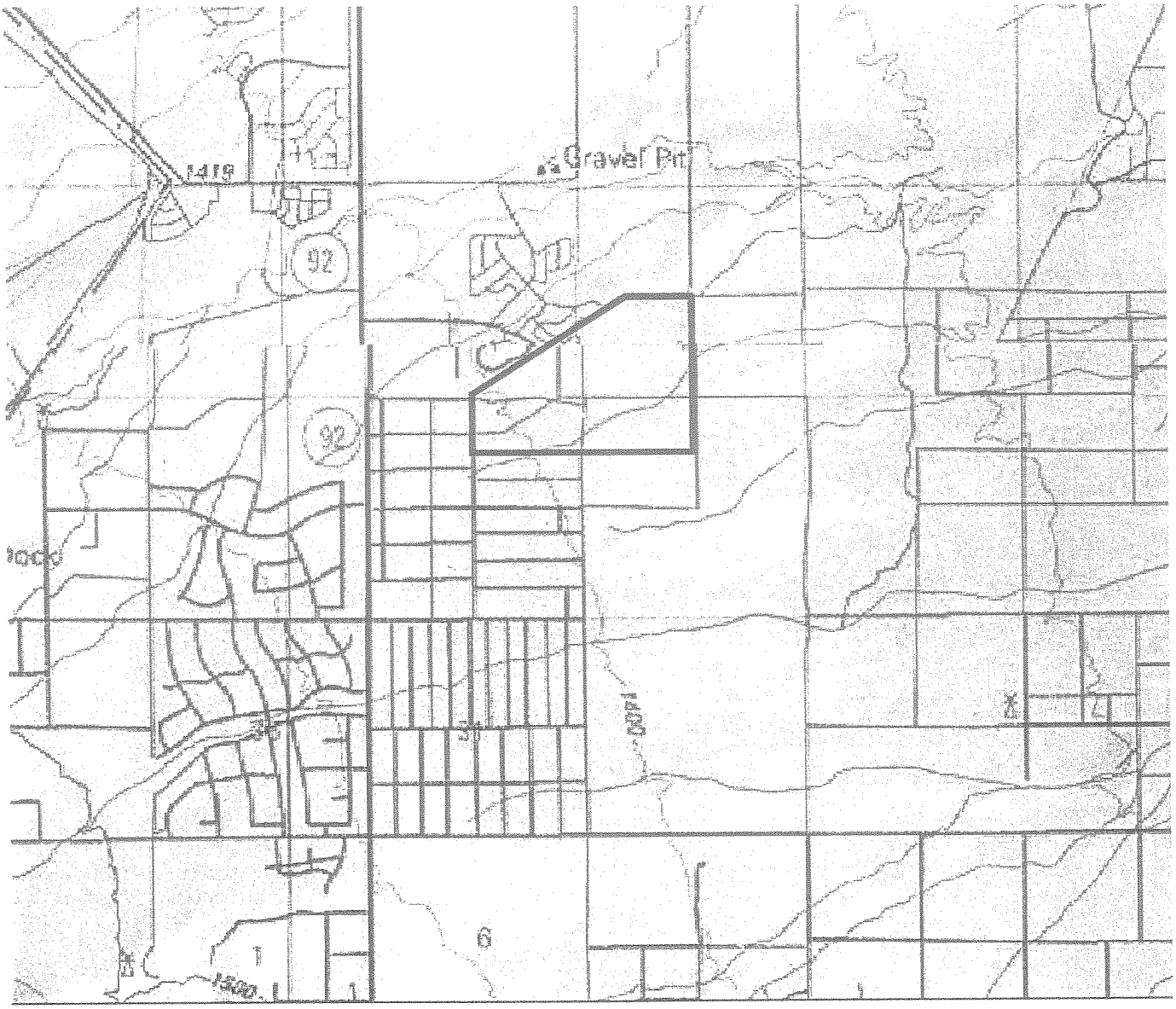
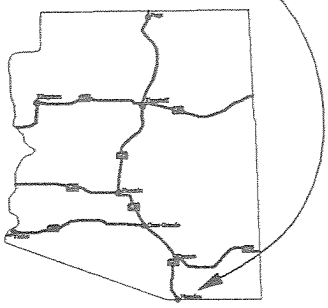
Table 1. Golden Acres Date: *12/8/05*

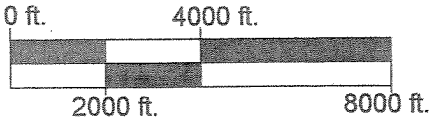
			Jurisdictional Indicators										
Site	Photopoints	Ground Photo numbers	Changes in soil	Waterline mark on bank	Shelving or cut banks	Exposed Roots	Sediment deposits	Presence of litter debris	Wash Width (feet)	Wash Depth (feet)	Vegetation Description (Type A, B, C)	Wash Width Category	Comments
A	**1,2,3**	1-1, 1-2, 1-3, 2 1, 2-2, 3-1, 3-2	Y	Y	Y	Y	Y	Y	ud	<0.5-2.2	A	ud	Potentially Non-Jurisdictional, lacks connectivity very braided, width is variable, sediment sandy deposits, grasses growing in drainage. Some deeper (2.2'), narrow channels
B	**4,5,6,7,19**	4-1,4-2,5-1,5-2,6-1,6-2,7-1,7 2, 19-1, 19-2	N	N	N	Y	some	Y	ud	< 1	B	ud	Potentially Non-jurisdictional, wide, shallow flow area. Mesquite, yucca, and grasses
C	**8**	8-1, 8-2, 8-3	N	N	N	Y	Y	Y	ud	0.5	A	ud	Potentially Non-Jurisdictional. Some narrow channels, but wide drainage with slight slope, grass, shrubs, trees
D	**9,10,11,12**	9-1, 9-2, 10-1, 10-2, 10-3, 11-1, 11-2, 12-1	N	Y, staining	N	Y	some	Y	ud	<1	B	ud	Potentially Non-Jurisdictional. Wide area of shallow flow. Catclaw, upland area is grassy, slopes gently up, lots of veg in wash, very wide >50 feet, shallow areas of sheet flow some small areas of channeling
E	**13,14,15**	13-1,13-2, 13-3, 14-1, 14-2, 15-1, 15-2, 15-3	N	N	N	Y	Y	Y	ud	3	B	ud	Potentially Non-Jurisdictional. Wide shallow drainage with a few slightly depressed channels
F	**16**	16-1, 16-2, 16-3	N	N	N	Y	Y	Y	ud	<1	C	ud	Potentially Non-Jurisdictional. Braided, channels in areas of wide but shallow flow. Acacia,mesquite, grassy
G	**17**	17-1, 17-2	N	N	N	Y	Y	Minimal	ud	1	B	ud	Potentially Non-Jurisdictional. Area is very messy, grassy and some channels
H	**18**	18-1, 18-2, 18-3	N	some stains	N	Y	some	Y	ud	<0.5	B	ud	Potentially Non-Jurisdictional. Wide shallow area of flow.

ud = undetermined width; limits to drainage are unclear due to wide, shallow pattern
Wash Width Classification (Level 1=greater than 15 feet, Level 2 = 10 to 14 feet, Level 3 = 5 to 9, Level 4 = Less than 5 feet)
Vegetation type classification (Type A=relatively dense stand of trees, Type B=Relatively open stand of trees with interspersed shrubs, Type C = Vegetation predominately shrubby, Trees absent or occuring at widely-spaced intervals.)



PROJECT LOCATION

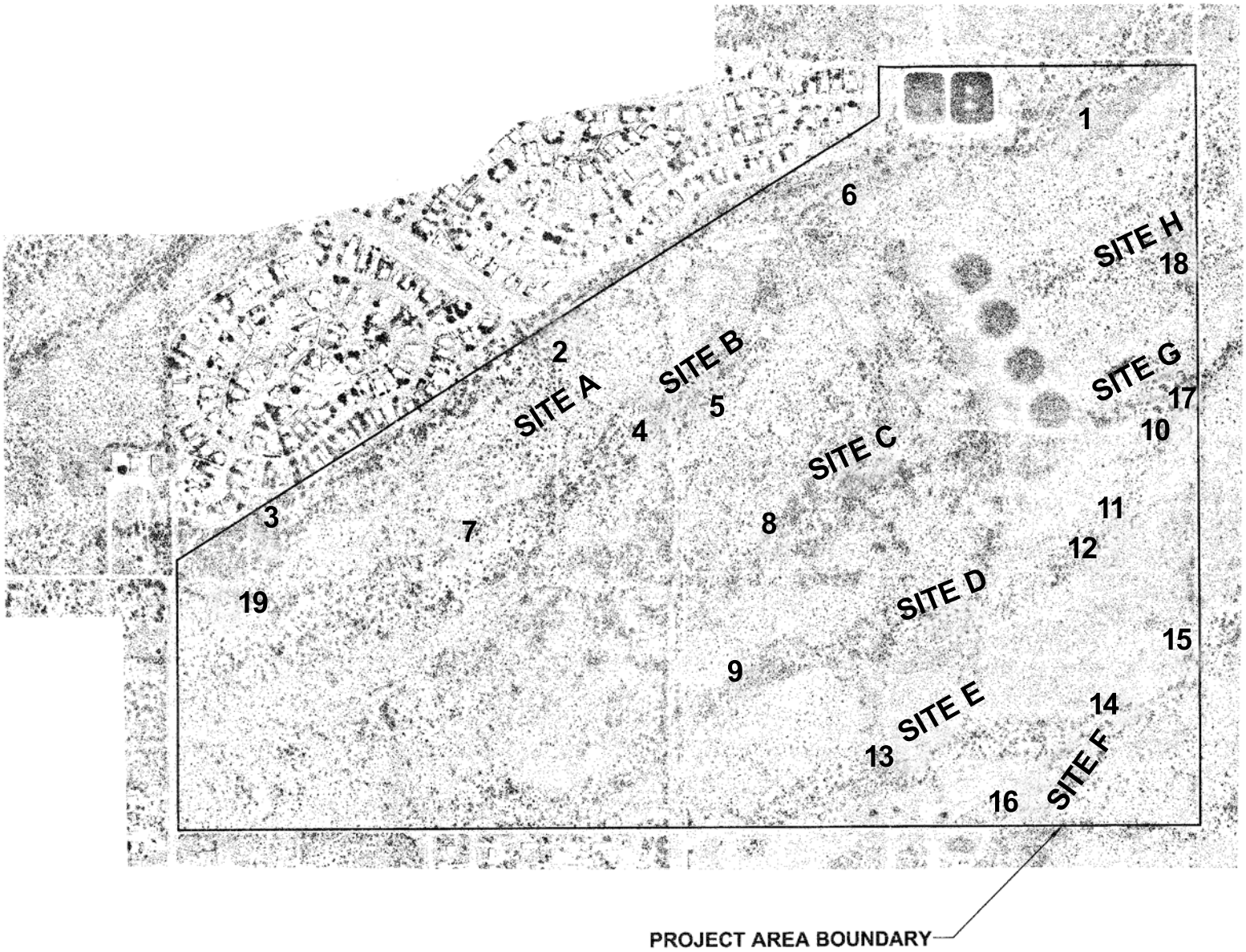




Golden Acres

Figure 1. Project Location

TOWNSHIP/RANGE: T22S R21E
SECTION: 19, 20, 29, 30
COUNTY: COCHISE
SCALE: 1"=4000'-0"



PROJECT LOCATION

LEGEND

• PHOTOPOINT

GOLDEN ACRES

Jurisdictional Waters Delineation

TOWNSHIP/RANGE: T22S R21E section 19, 20, 29, 30
COUNTY: COCHISE
AERIAL SOURCE: SUN MAPPING, LLC
AERIAL DATE: NOVEMBER 2005
SCALE: 1"=300'-0" (1 INCH = 300 FEET)

SCALE 1"=300' 0"
0 150' 300' 600'

SAGE
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1435 W. BROADWAY, SUITE 206
TEMPE, ARIZONA 85282
TEL 480.894.2399
FAX 480.874.3395
www.sagelandscape.com

Photo point: 1-1: Upstream Site A

Photo point: 1-2: Upstream Site A

Photo point 1-3: Downstream Site A

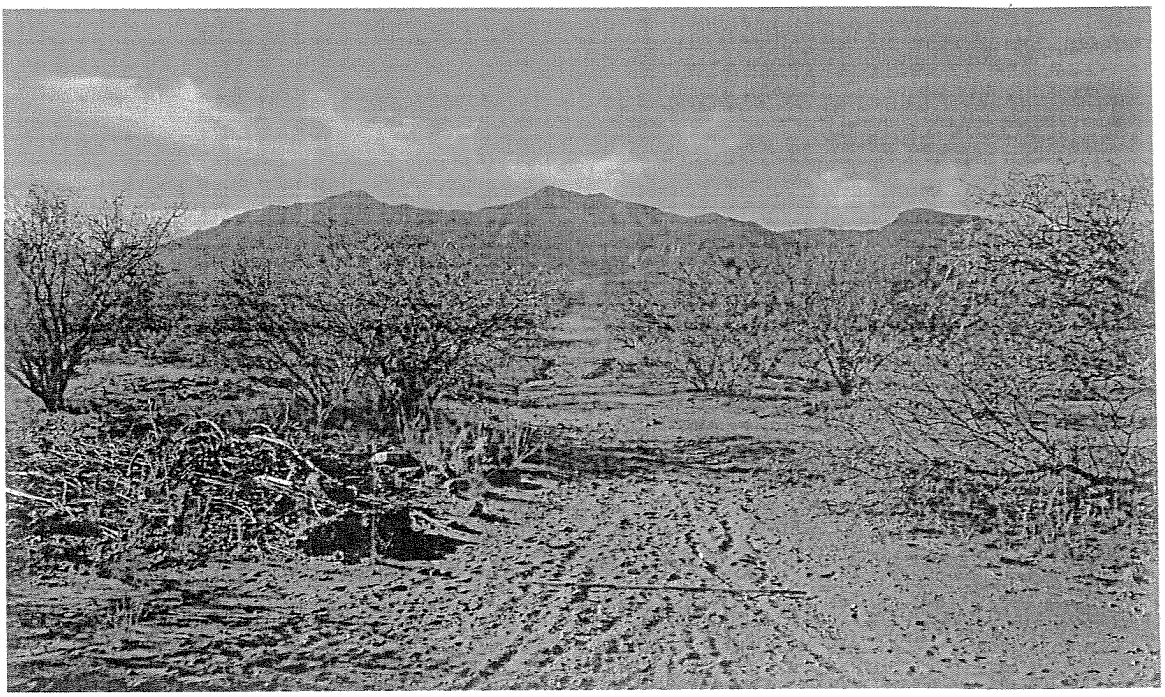


Photo point: 2-1: Upstream Site A

Photo point 2-2: Downstream Site A

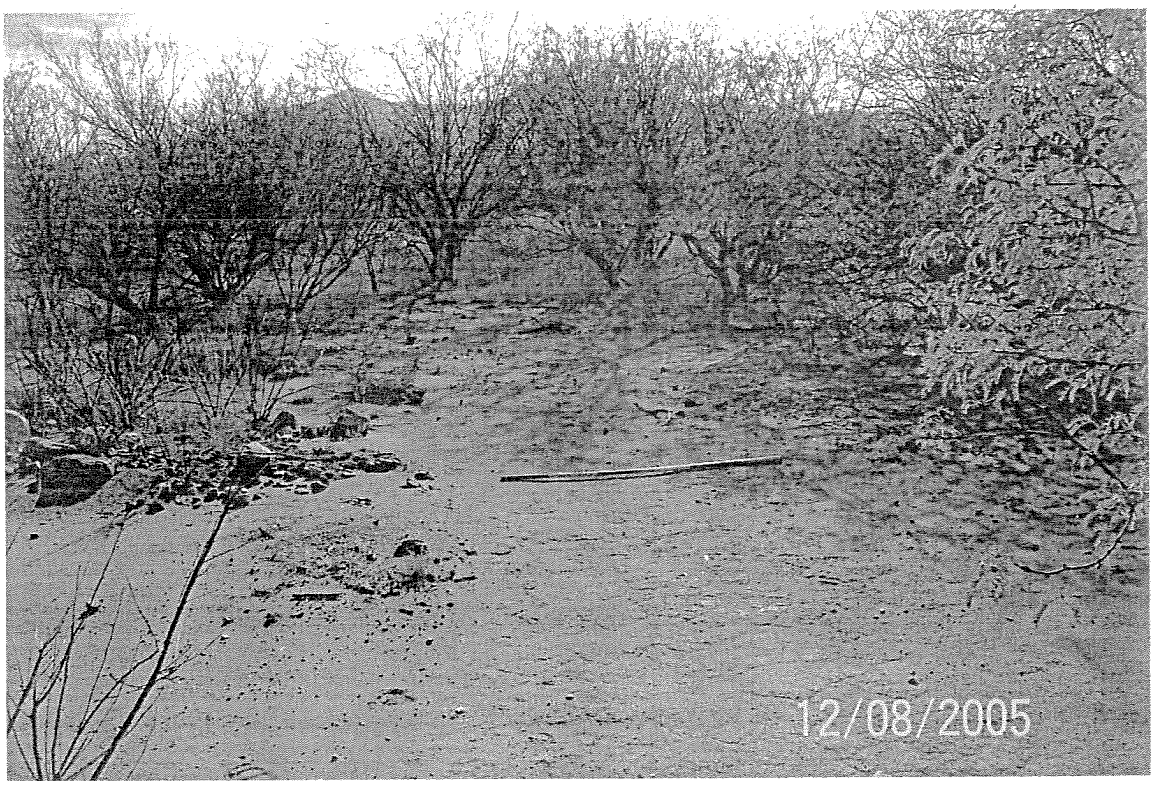


Photo point 3-1: Upstream Site A

Photo point 3-2: Downstream Site A

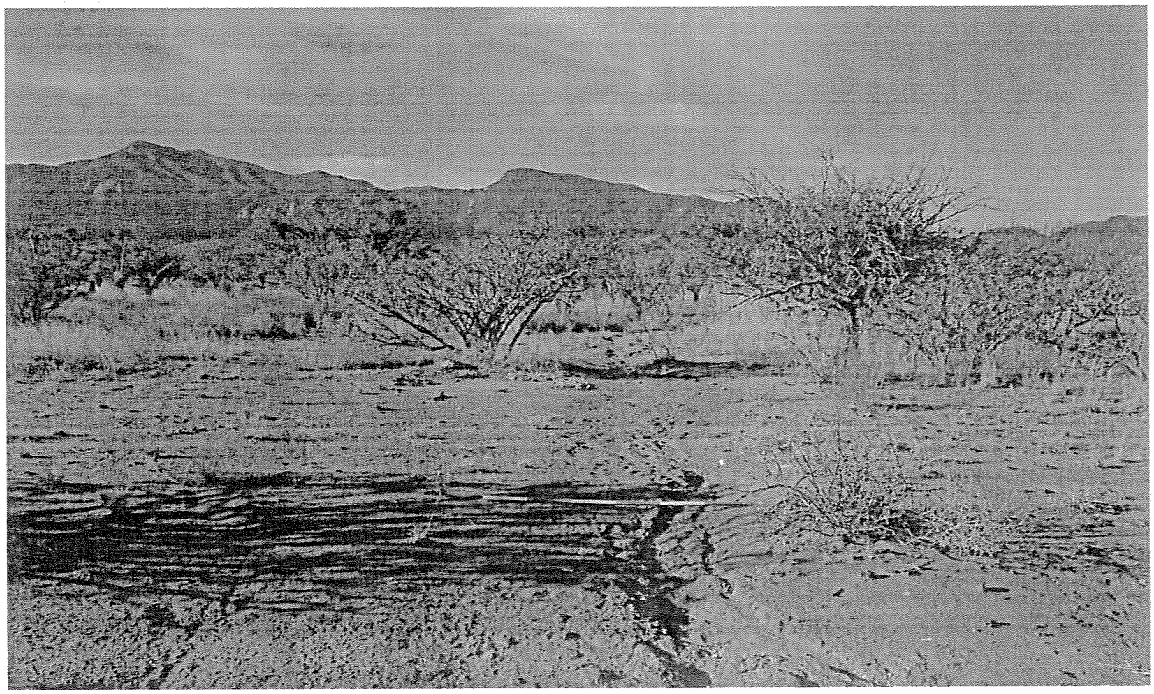


Photo point 4-1: Upstream Site B

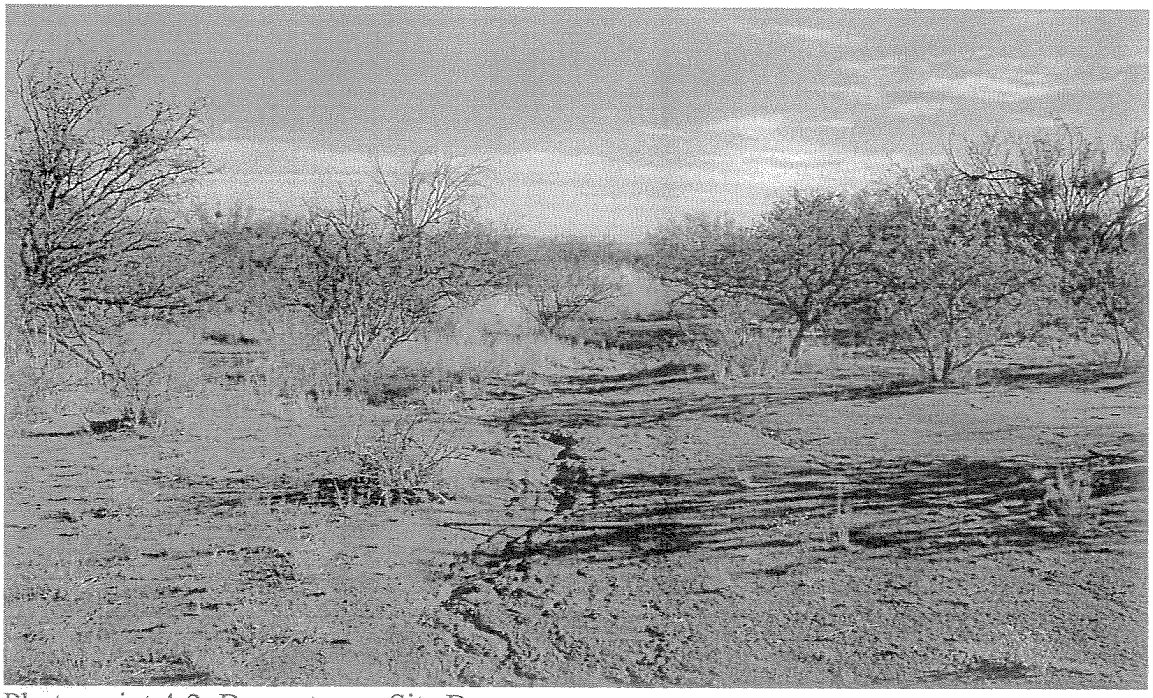


Photo point 4-2: Downstream Site B

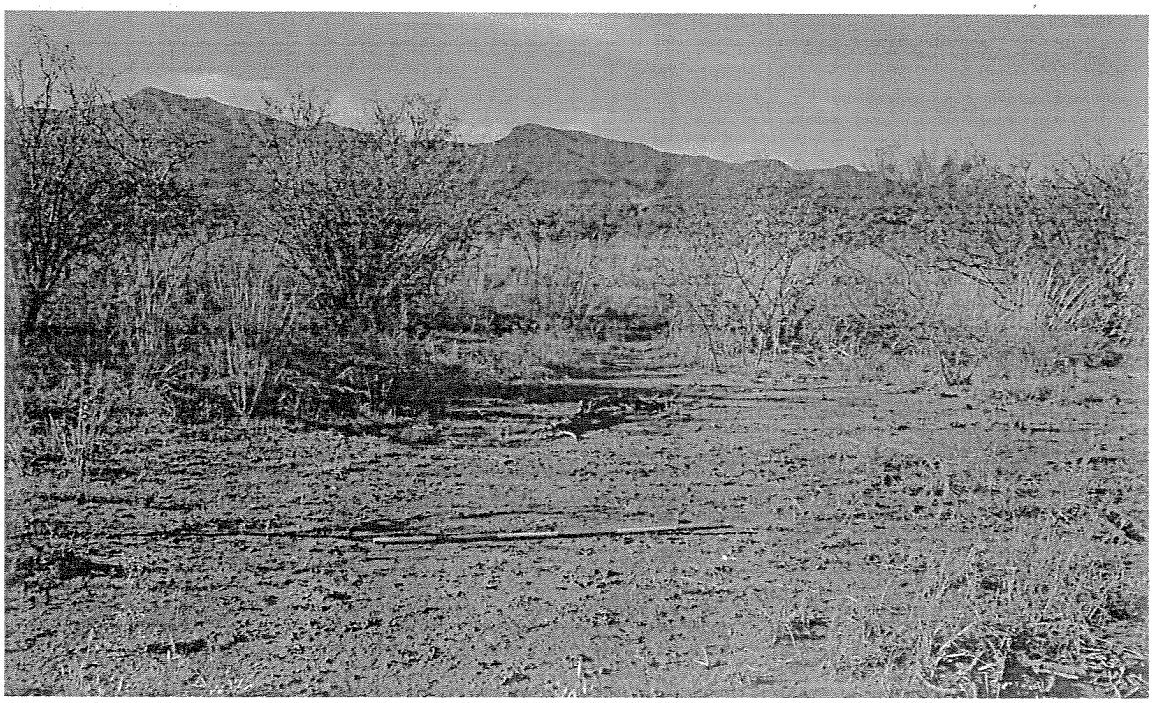


Photo point 5-1: Upstream Site B

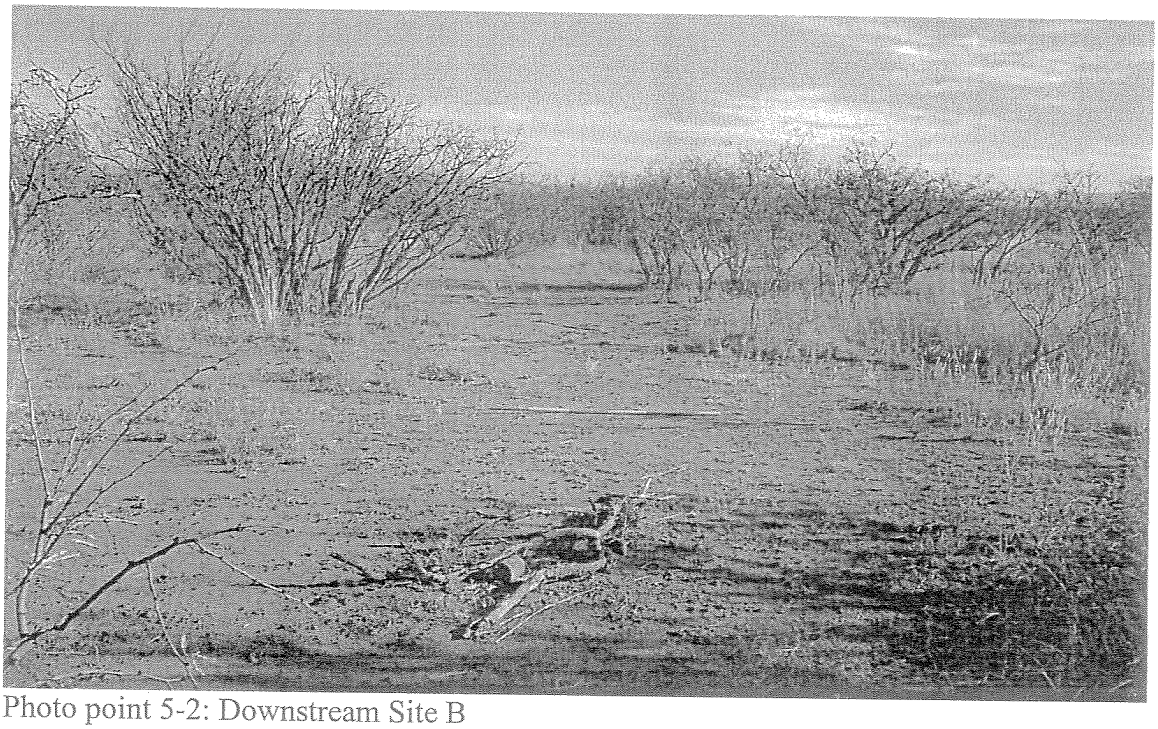


Photo point 5-2: Downstream Site B

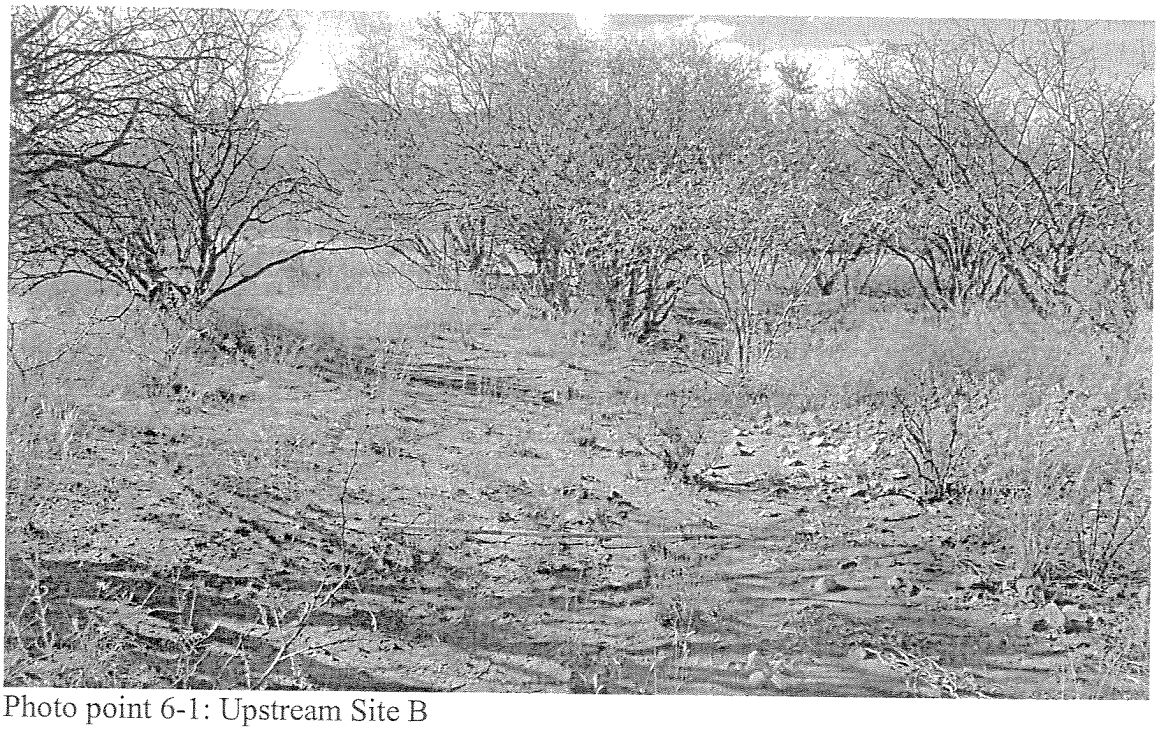


Photo point 6-1: Upstream Site B

Photo point 6-2: Downstream Site B

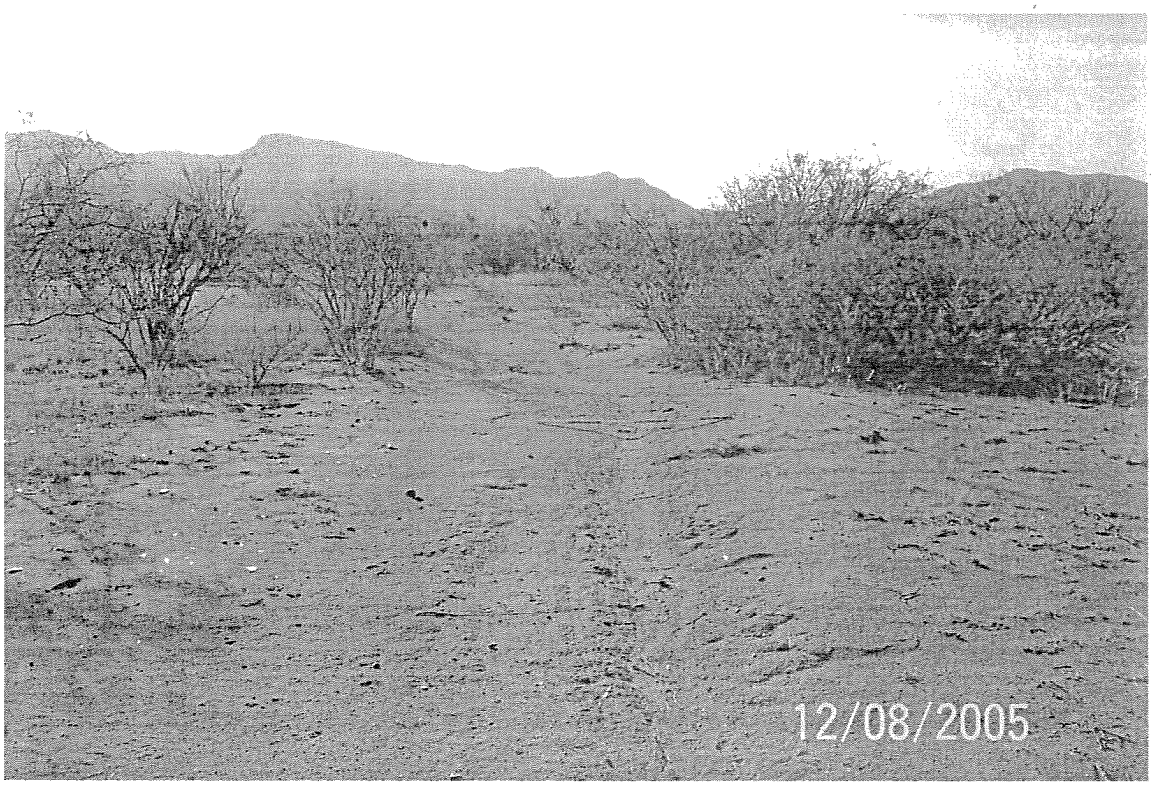
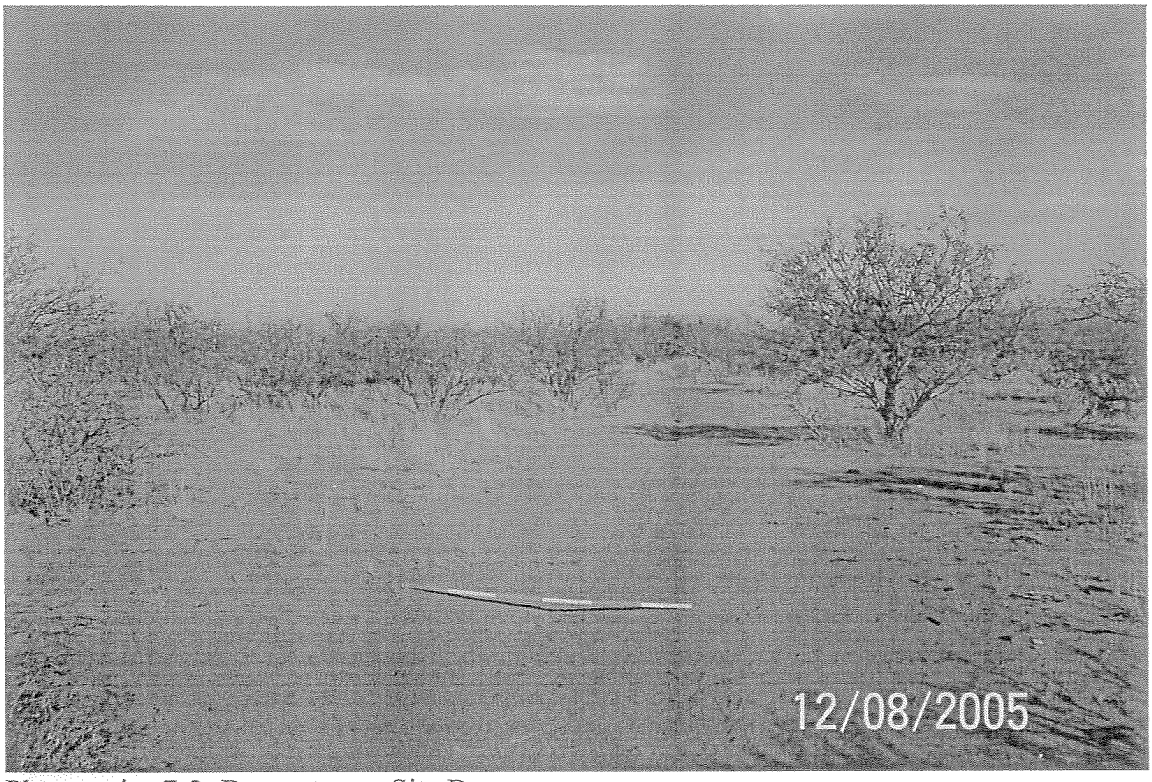


Photo point 7-1: Upstream Site B



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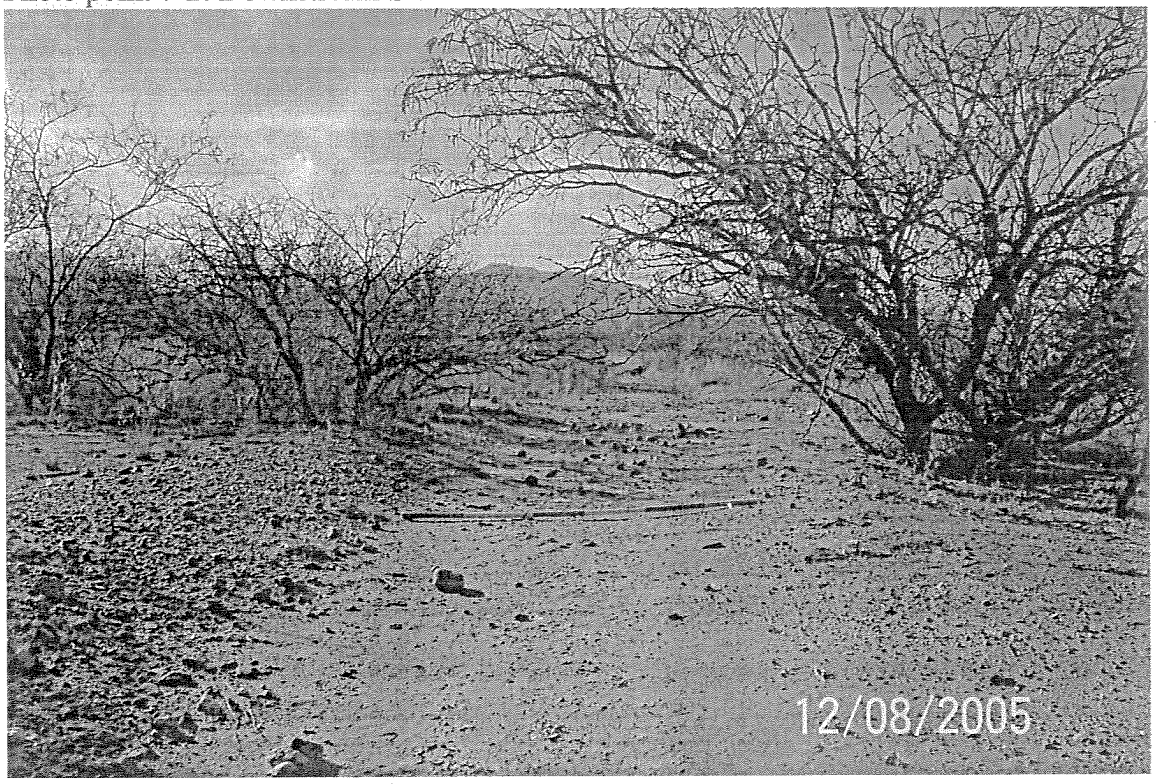


Photo point 19-1: Upstream Site B

Photo point 19-2: Downstream Site B

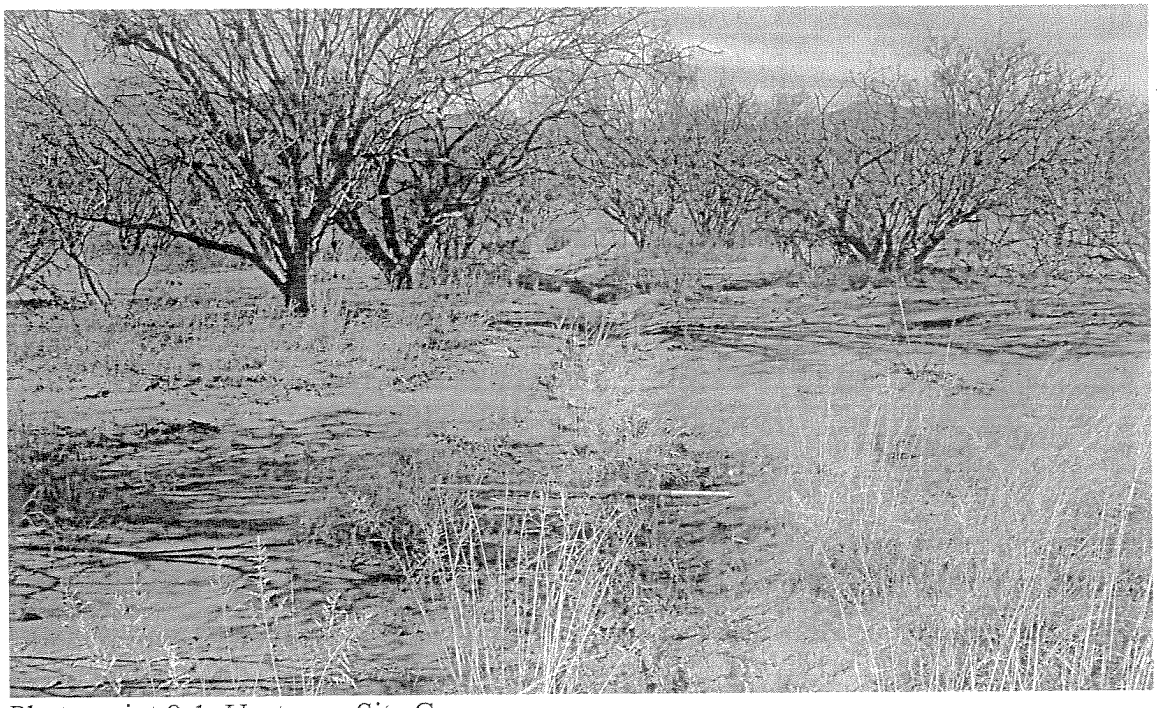
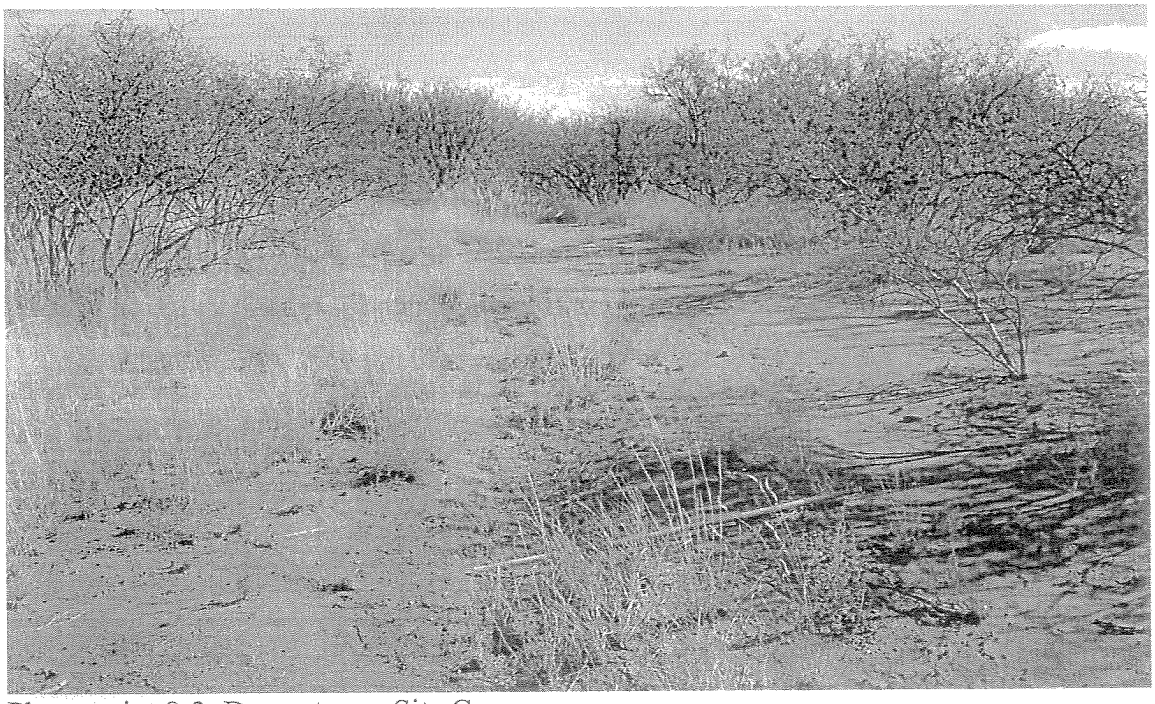


Photo point 8-1: Upstream Site C



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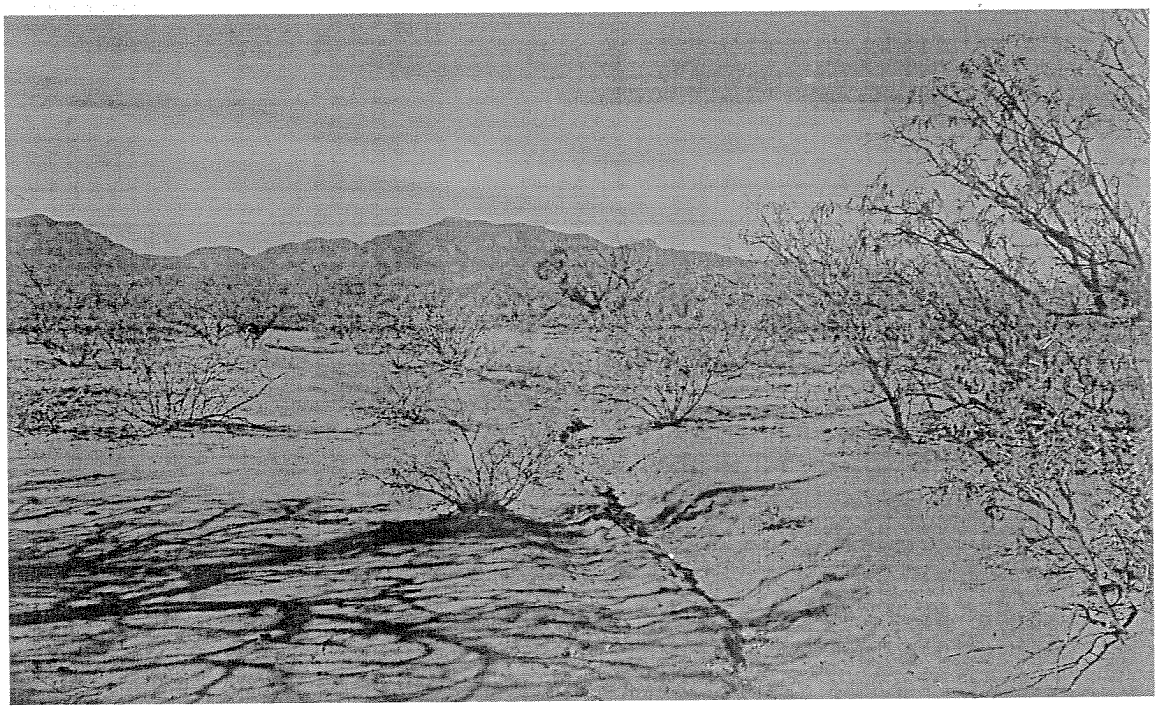

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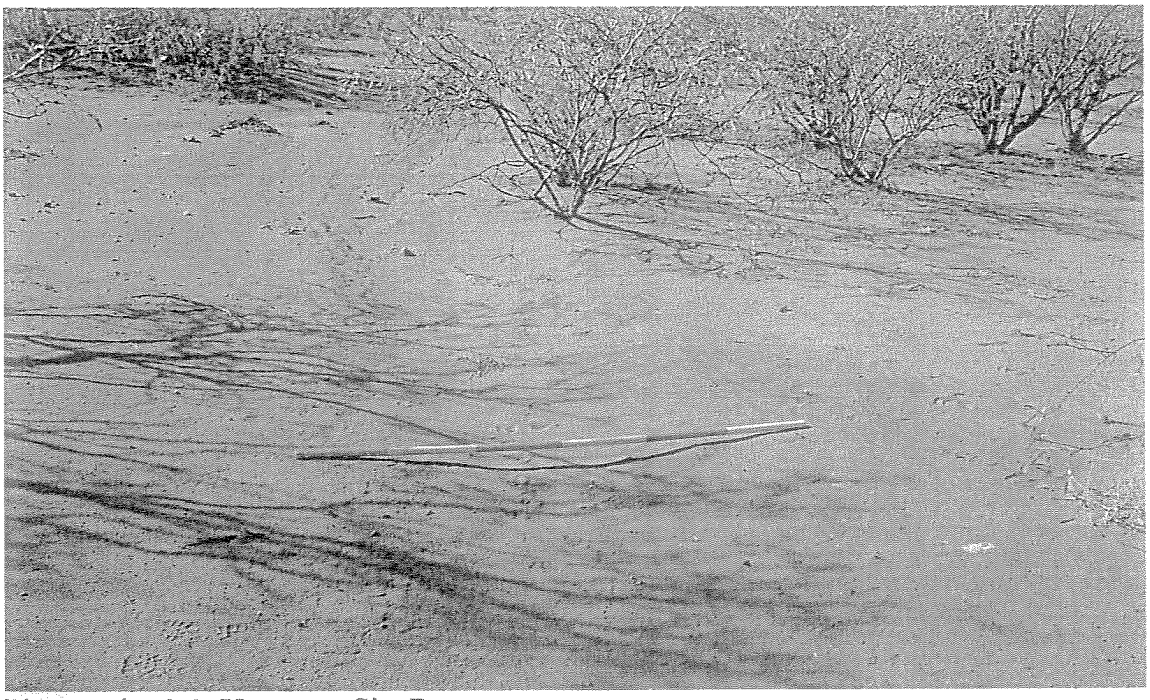
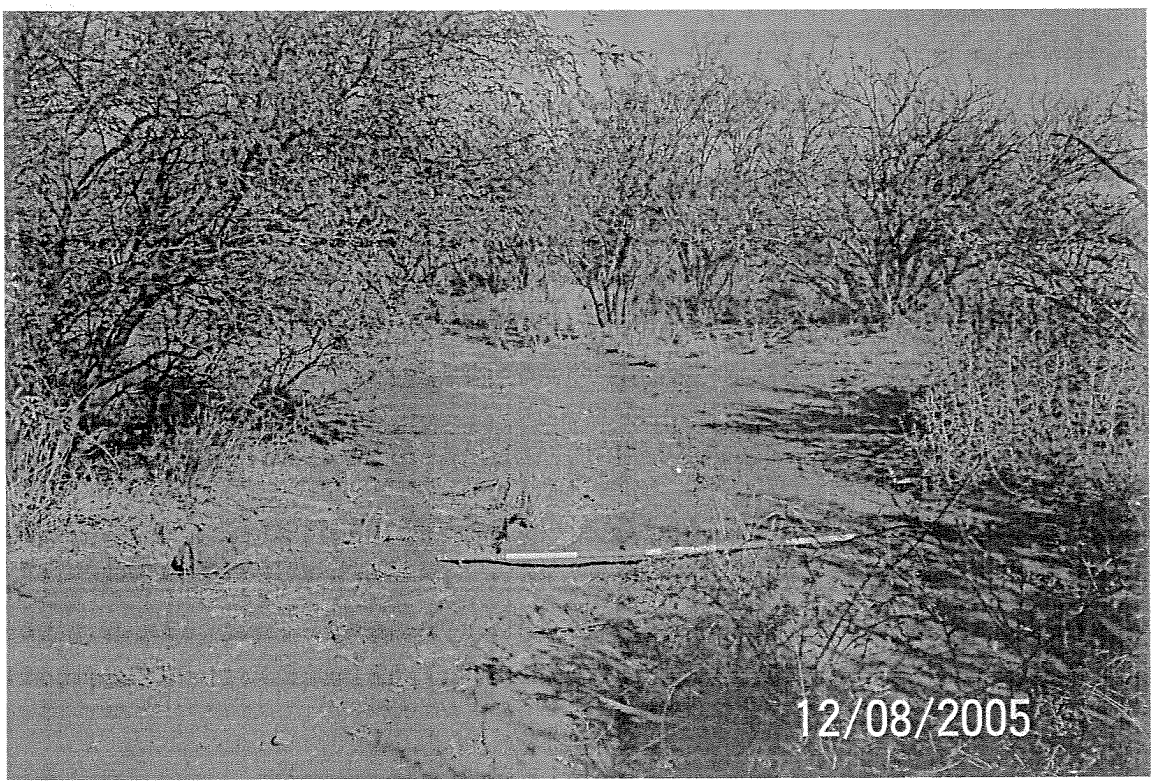


Photo point 9-1: Upstream Site D

Photo point 9-2: Downstream Site D

Photo point 10-1: Upstream Site D



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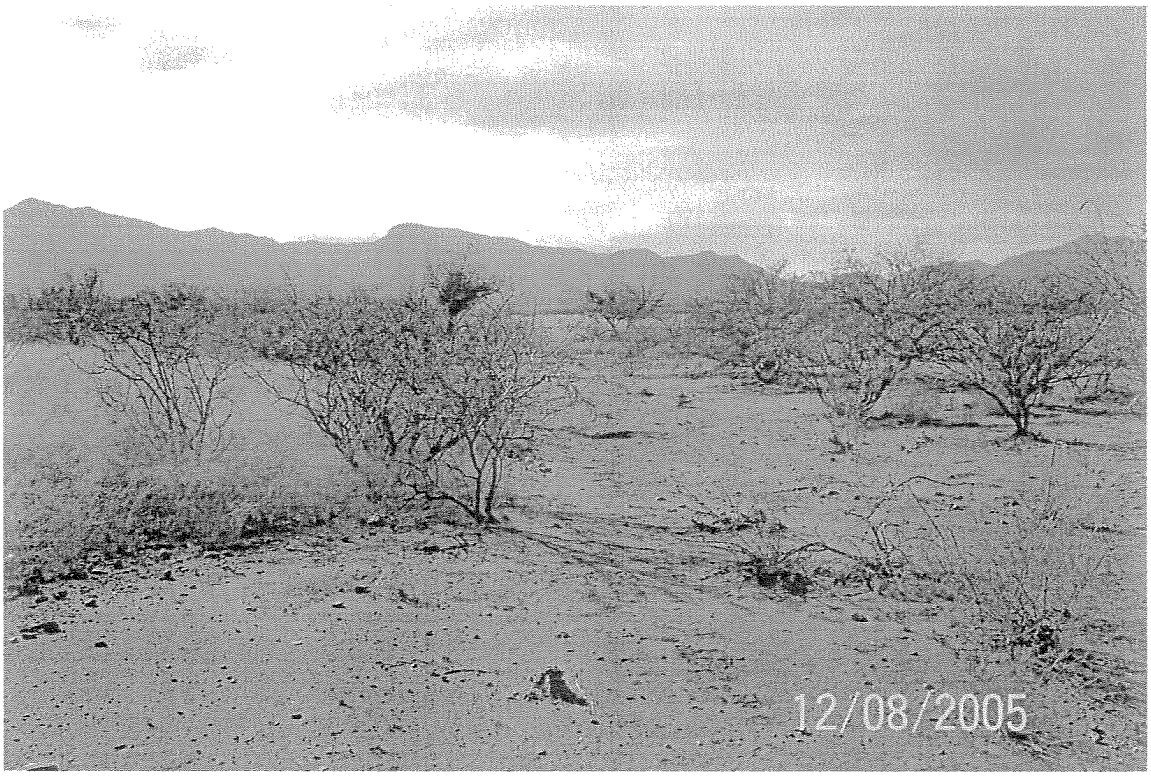

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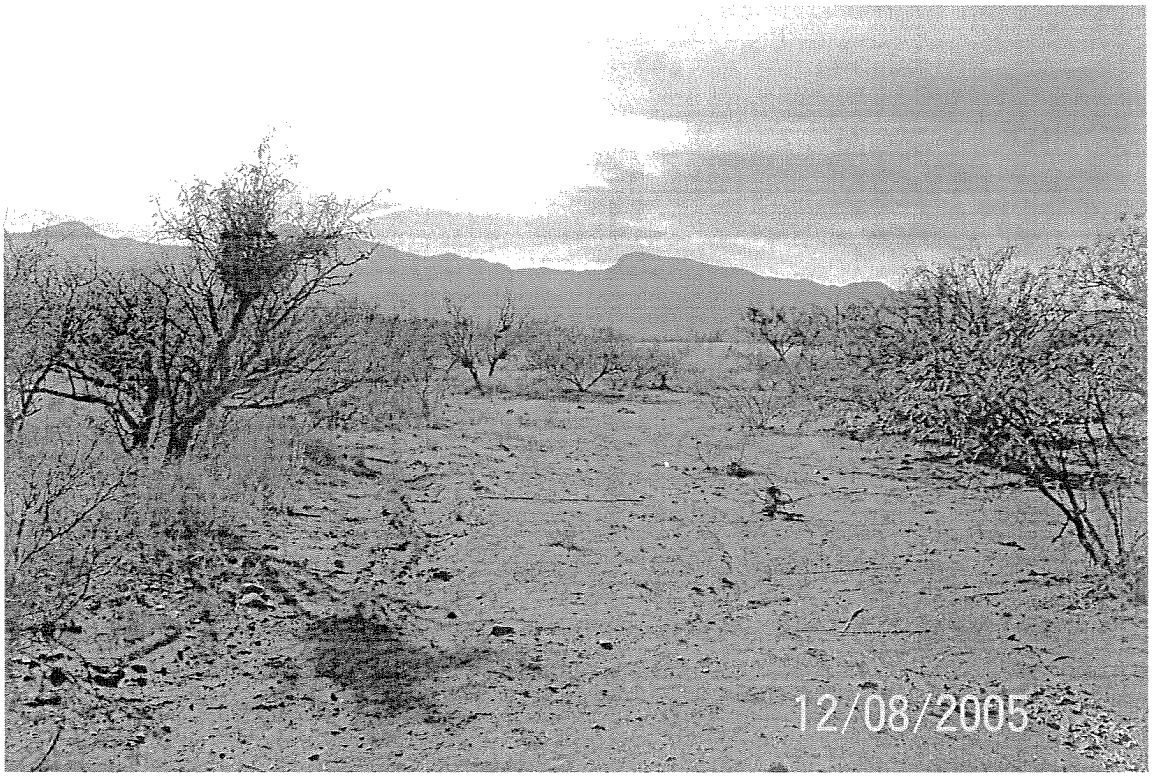

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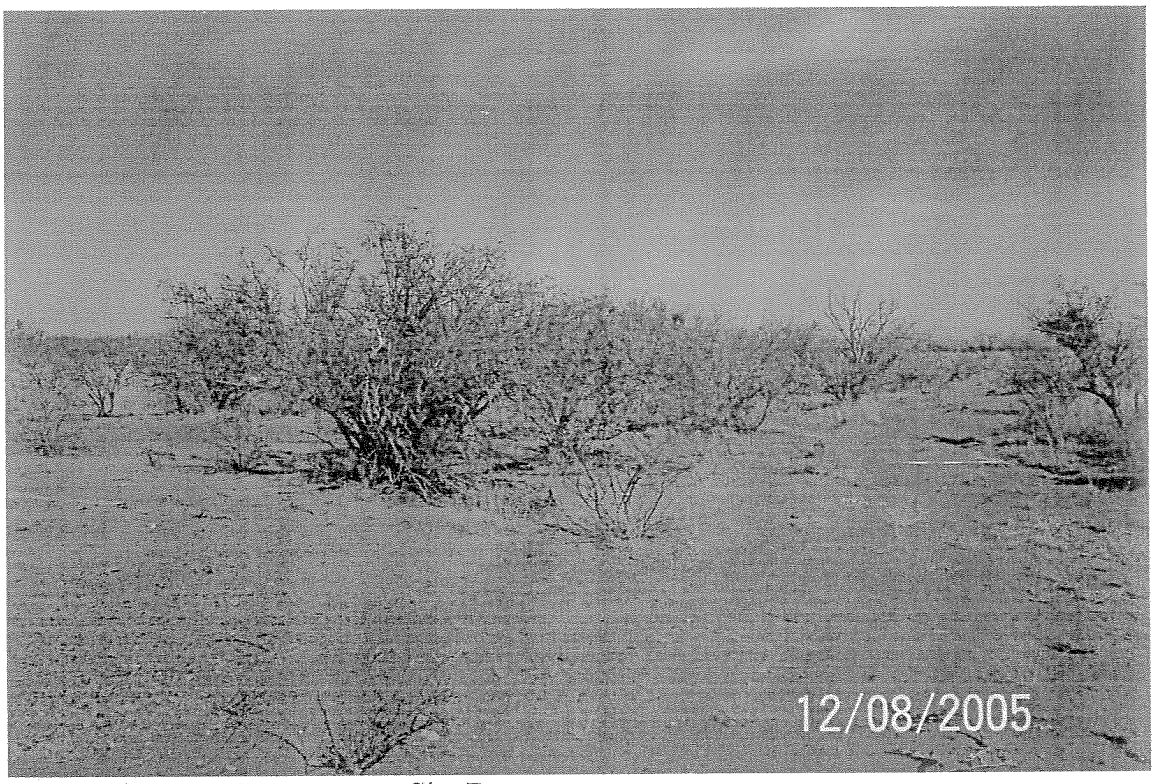

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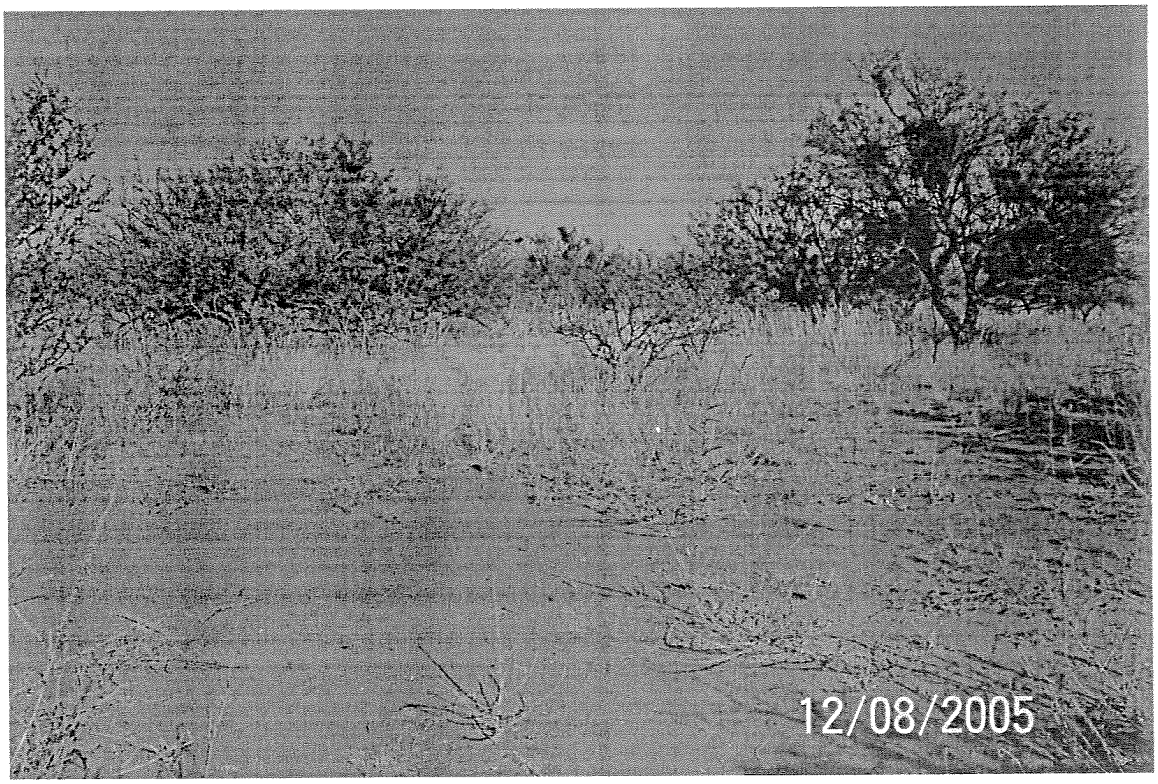

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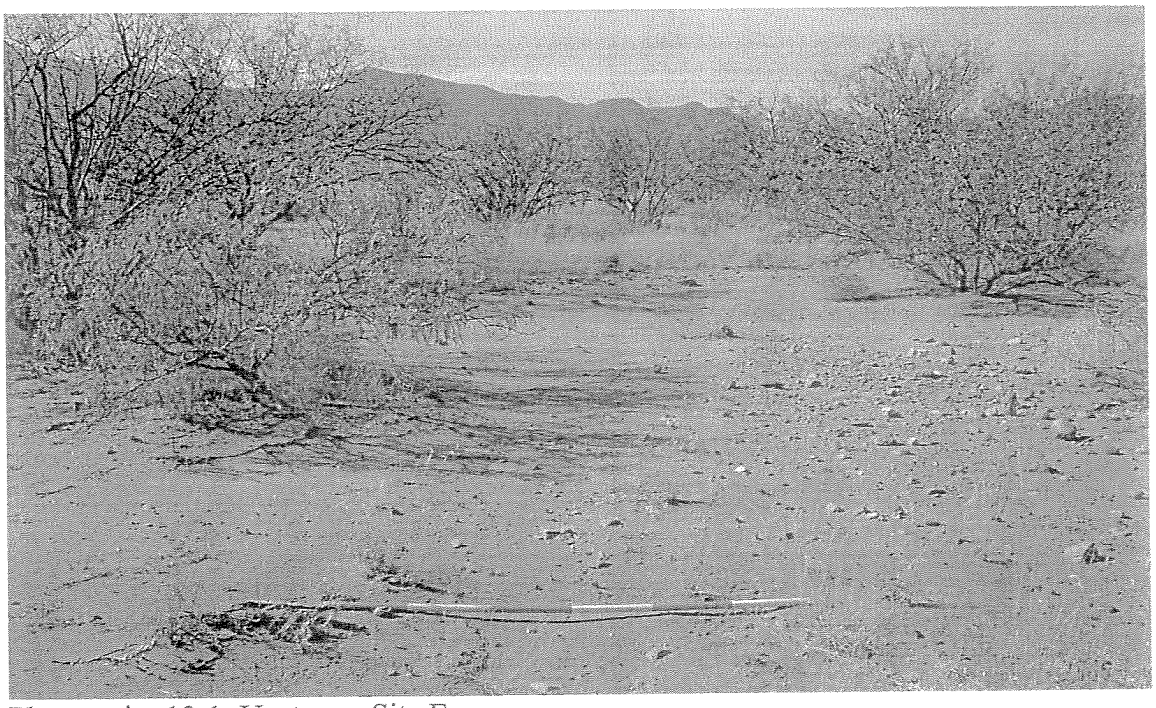


Photo point 13-1: Upstream Site E

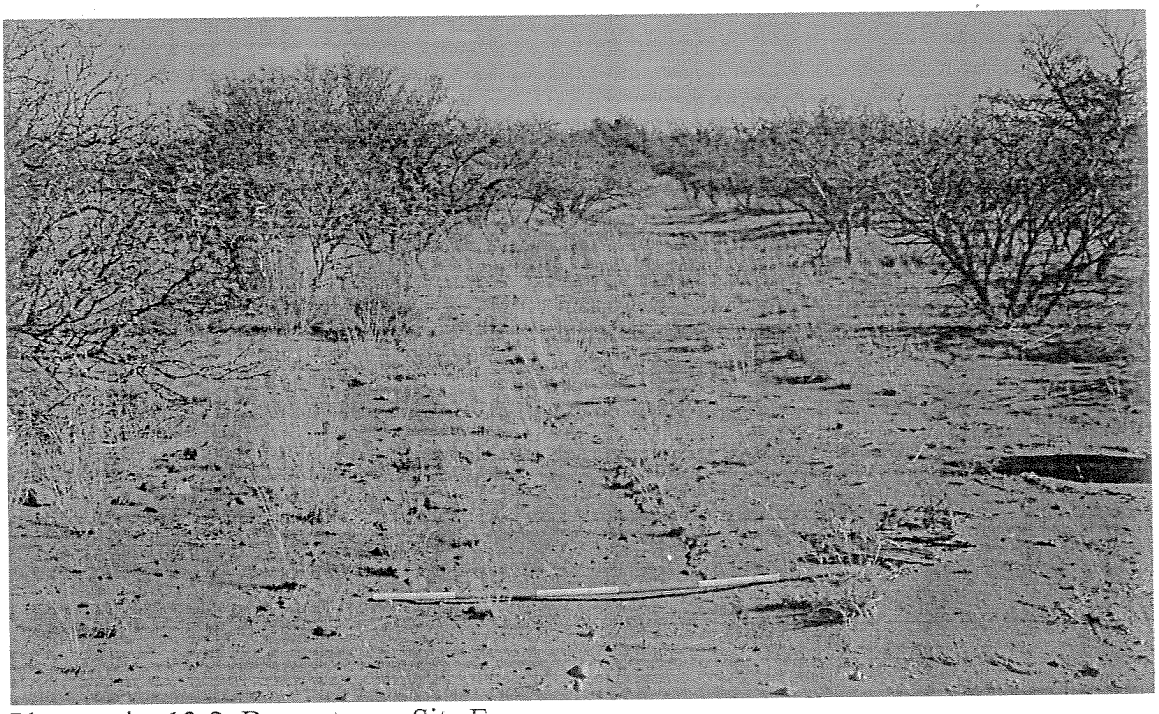


Photo point 13-2: Downstream Site E

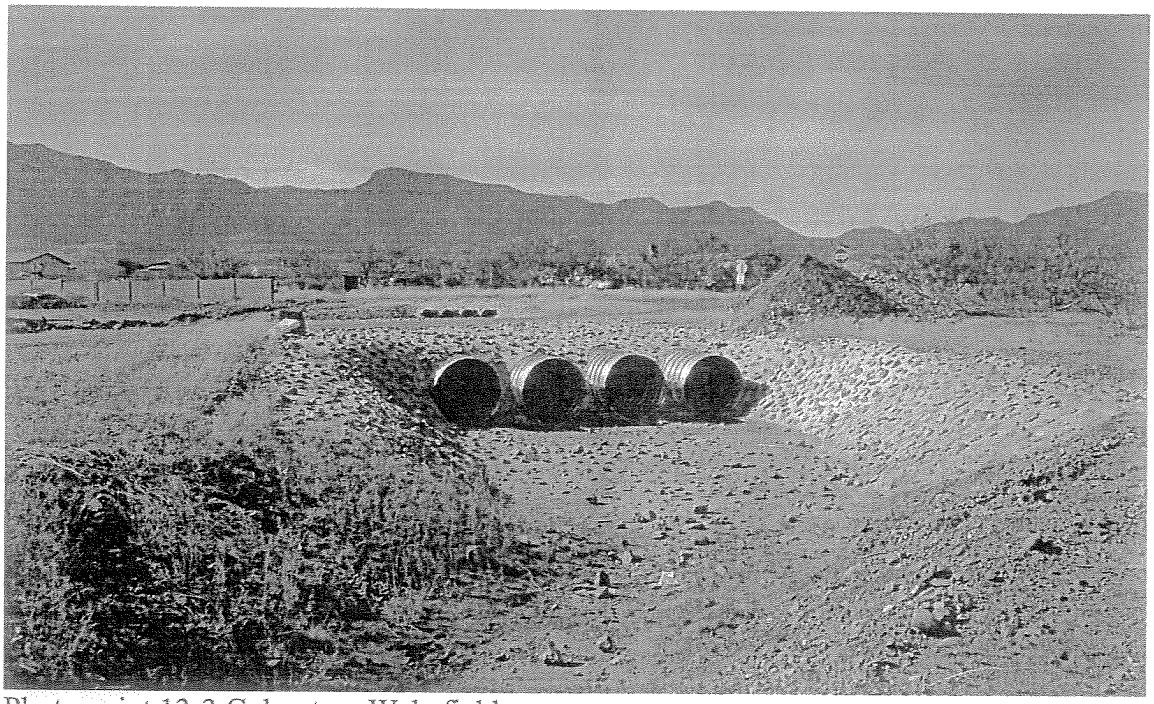


Photo point 13-3 Culvert on Wakefield

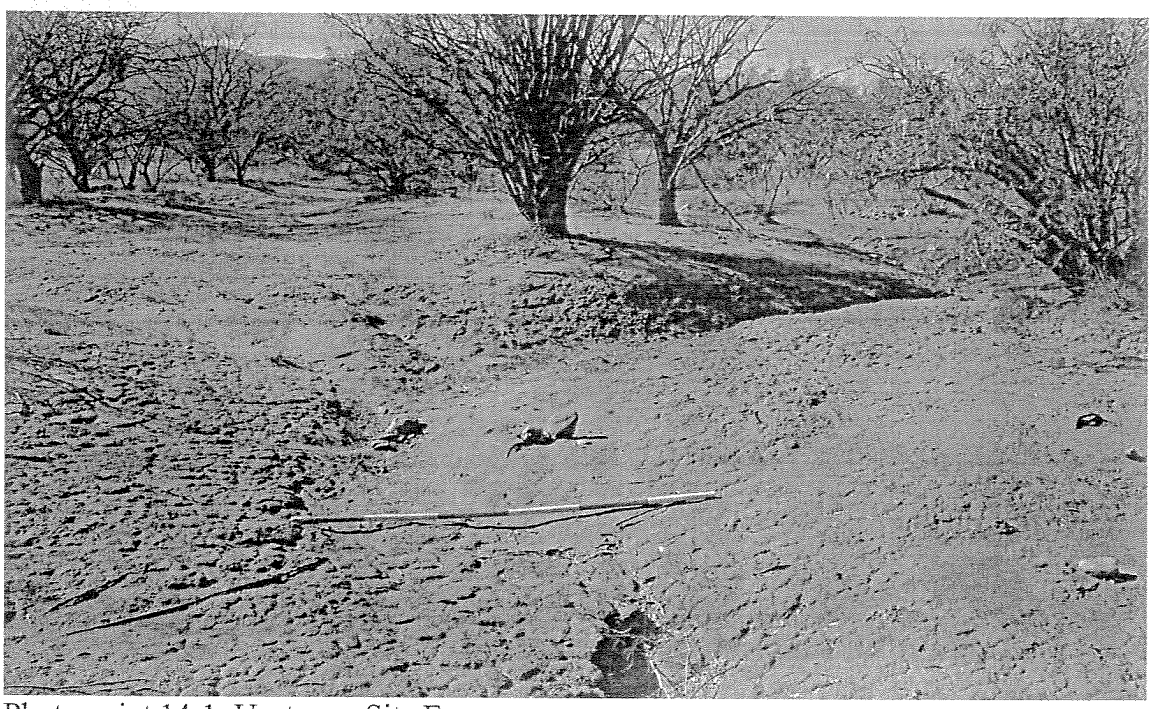


Photo point 14-1: Upstream Site E

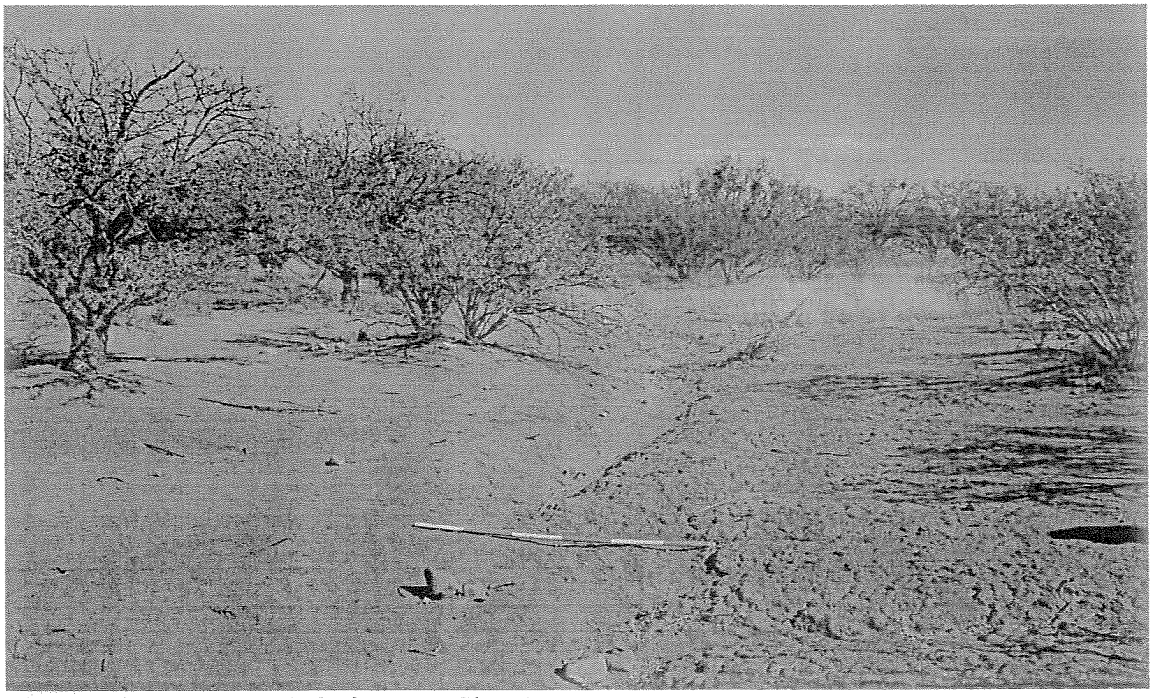


Photo point 14-2: Bank facing east Site E

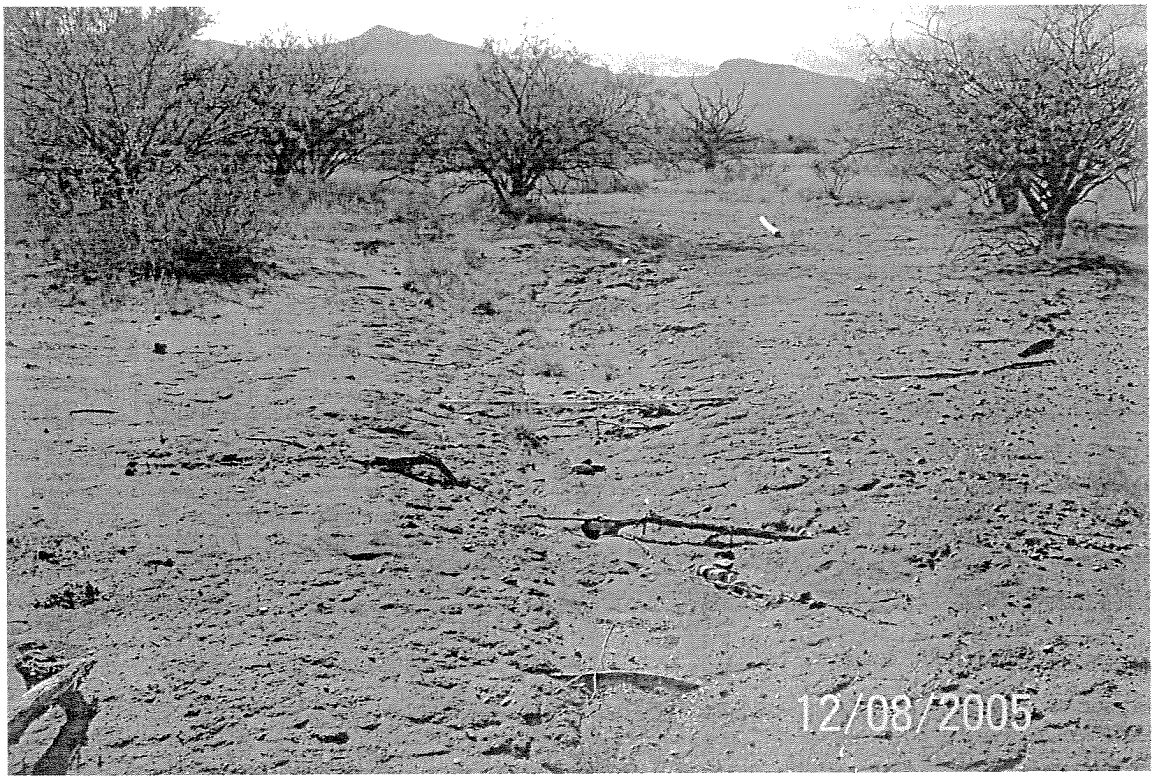


Photo point 15-1: Upstream Site E

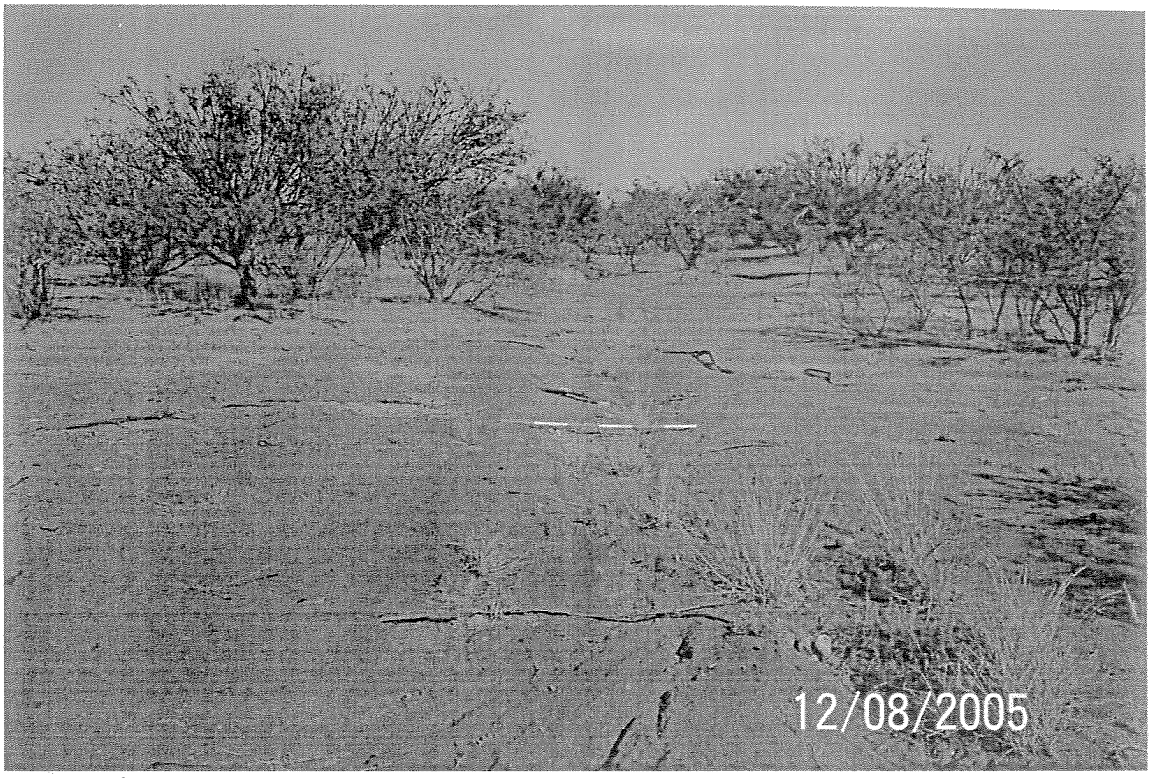


Photo point 15-2: Downstream Site E

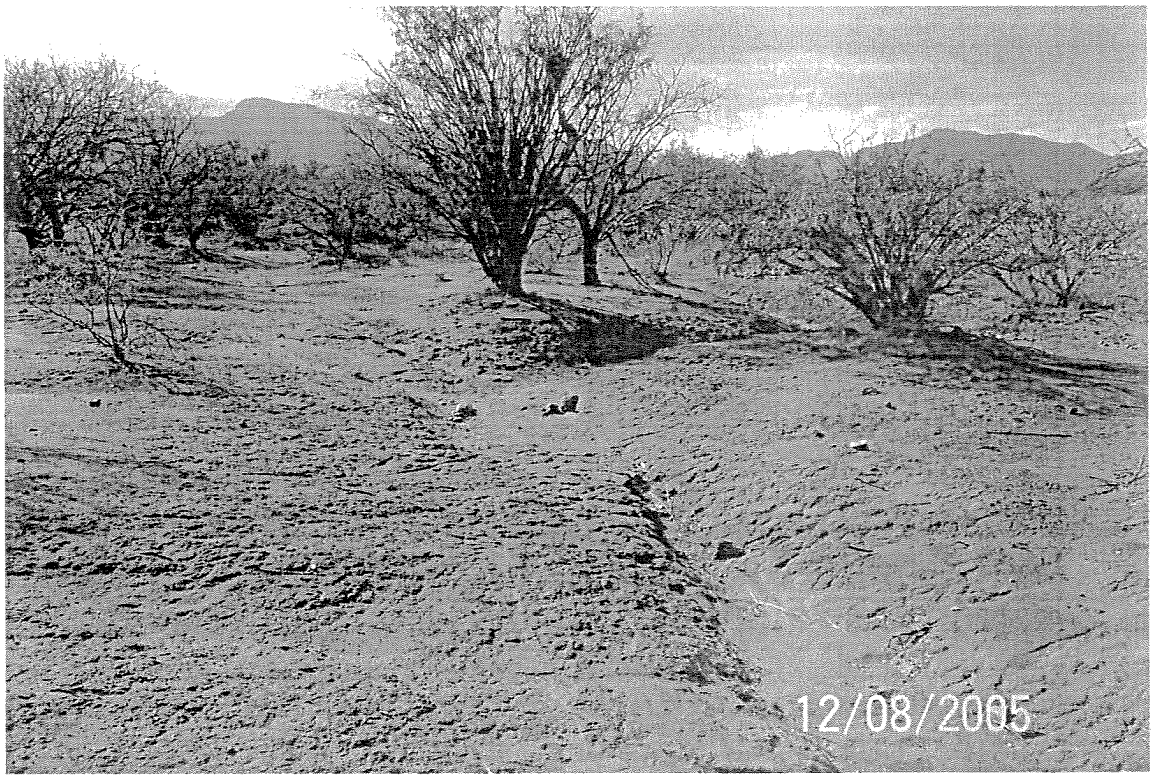
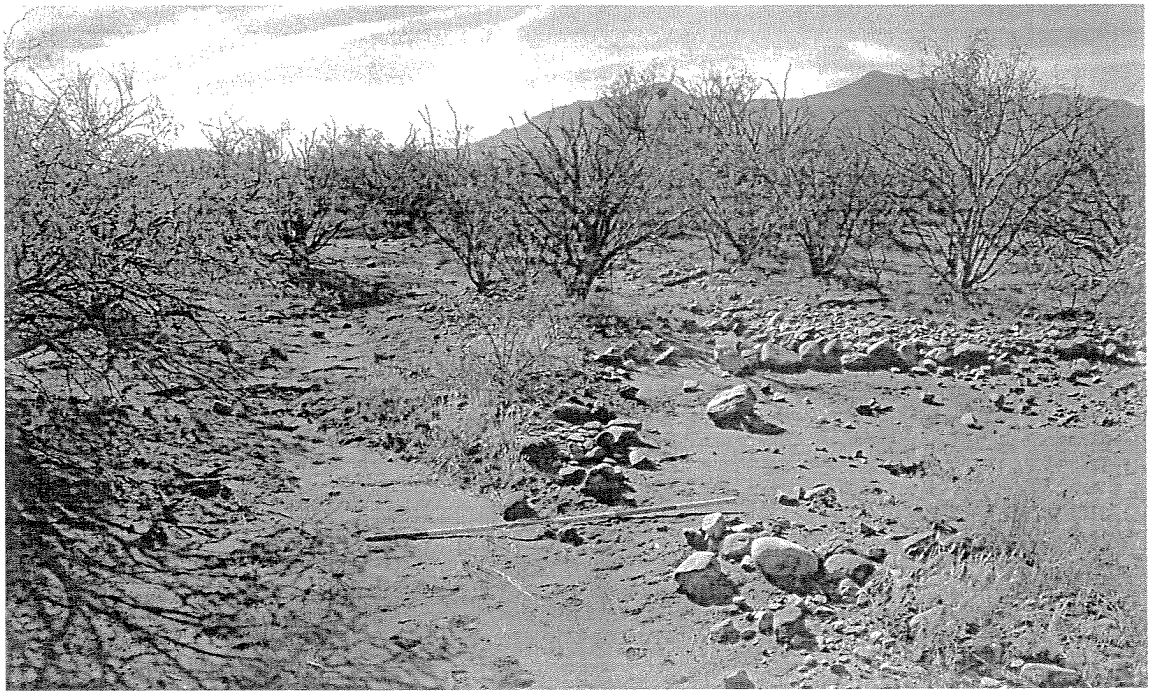


Photo point 15-3: Upstream Site E

Photo point 16-1: Flow into site F



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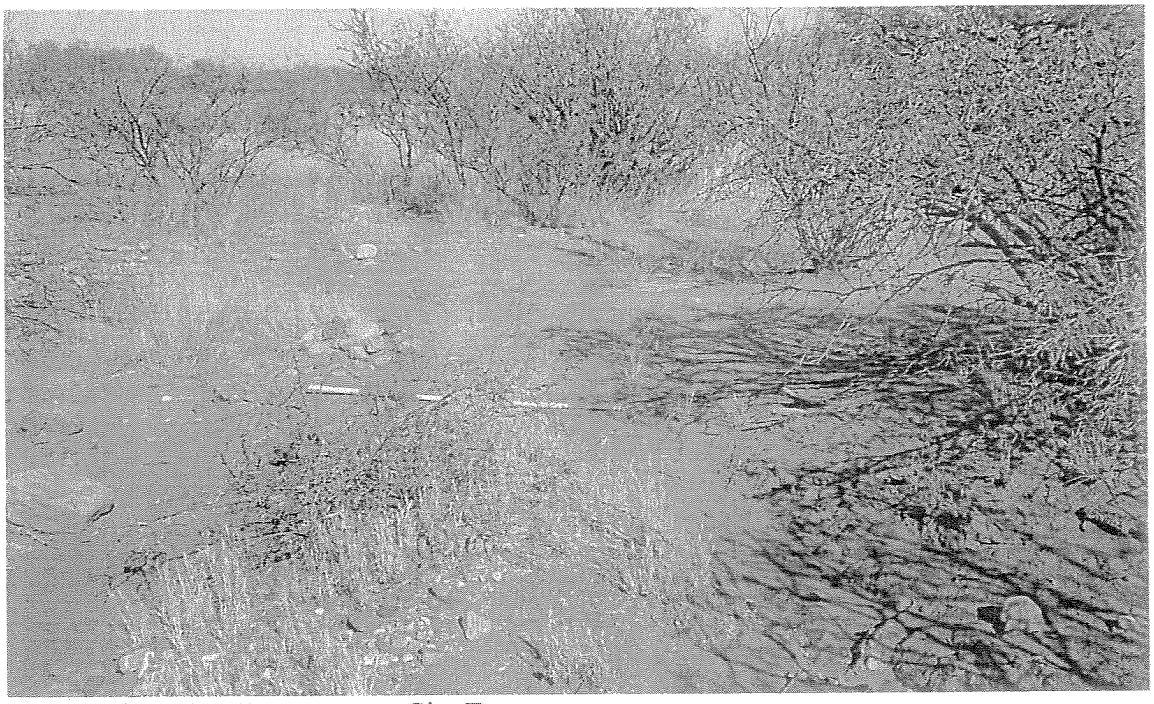

Photo point 16-3: Downstream Site F

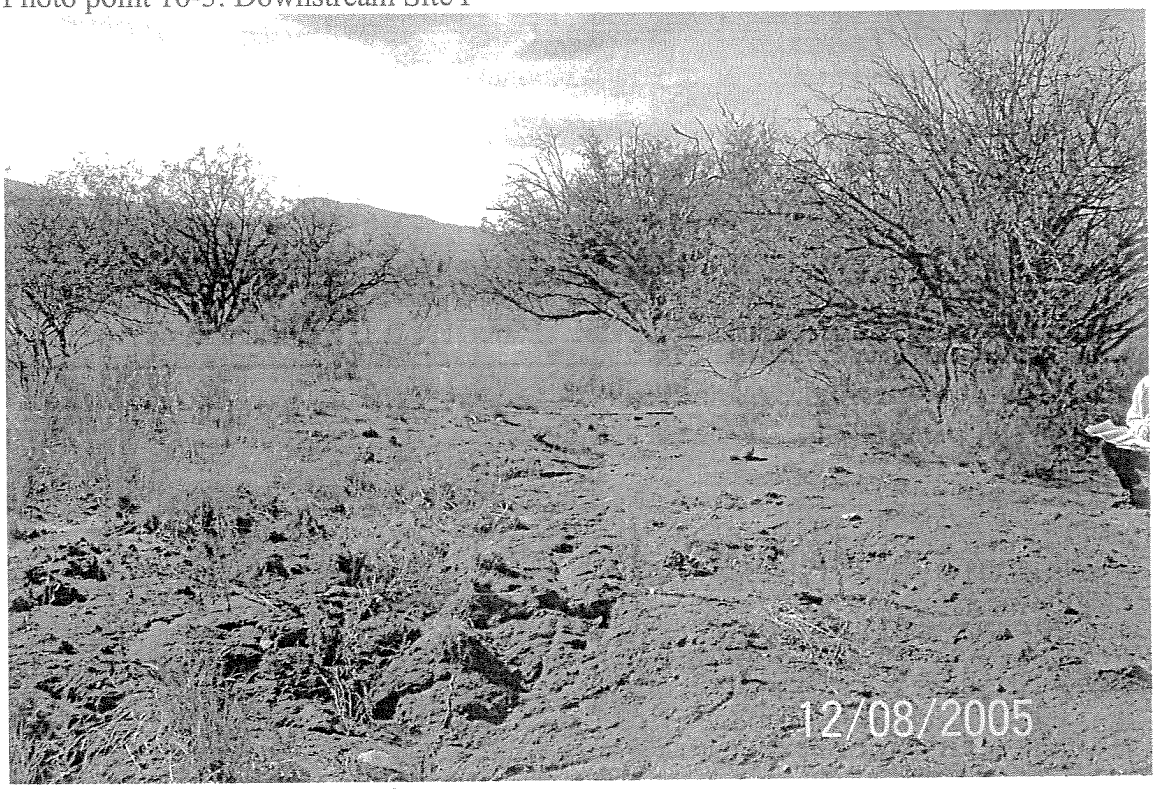

Photo point 17-1: Upstream Site G

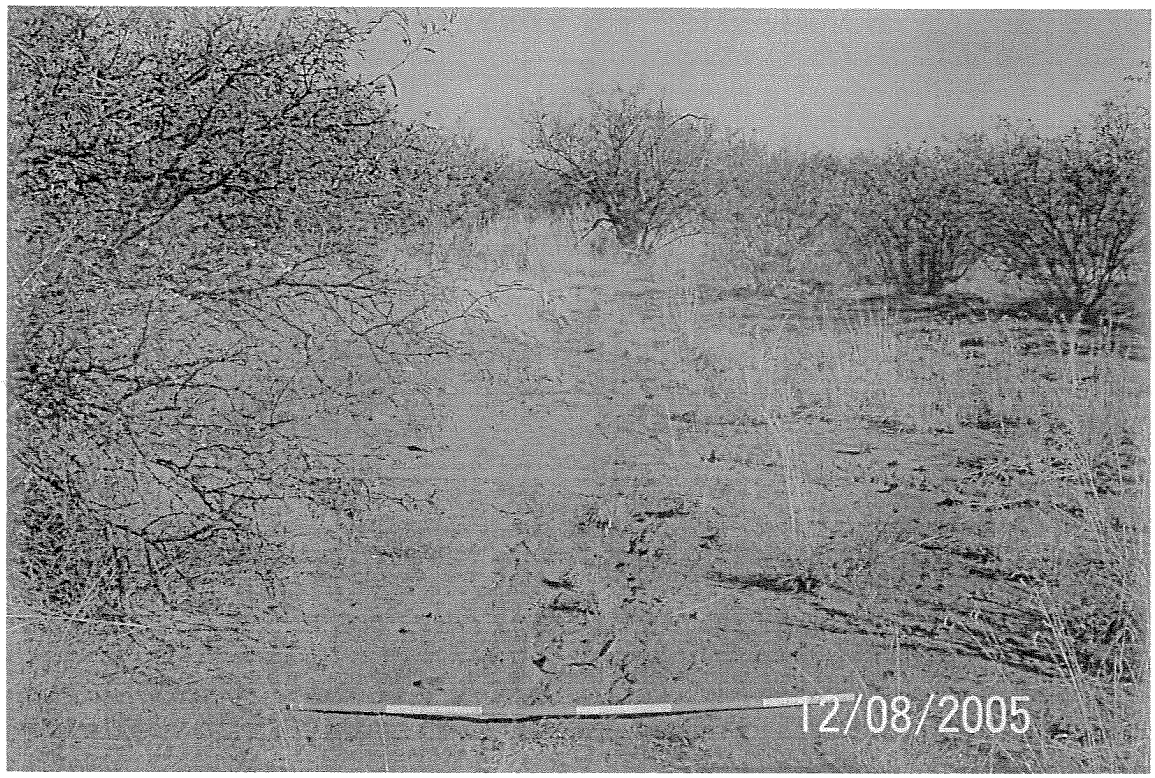

Photo point 17-2: Downstream Site G

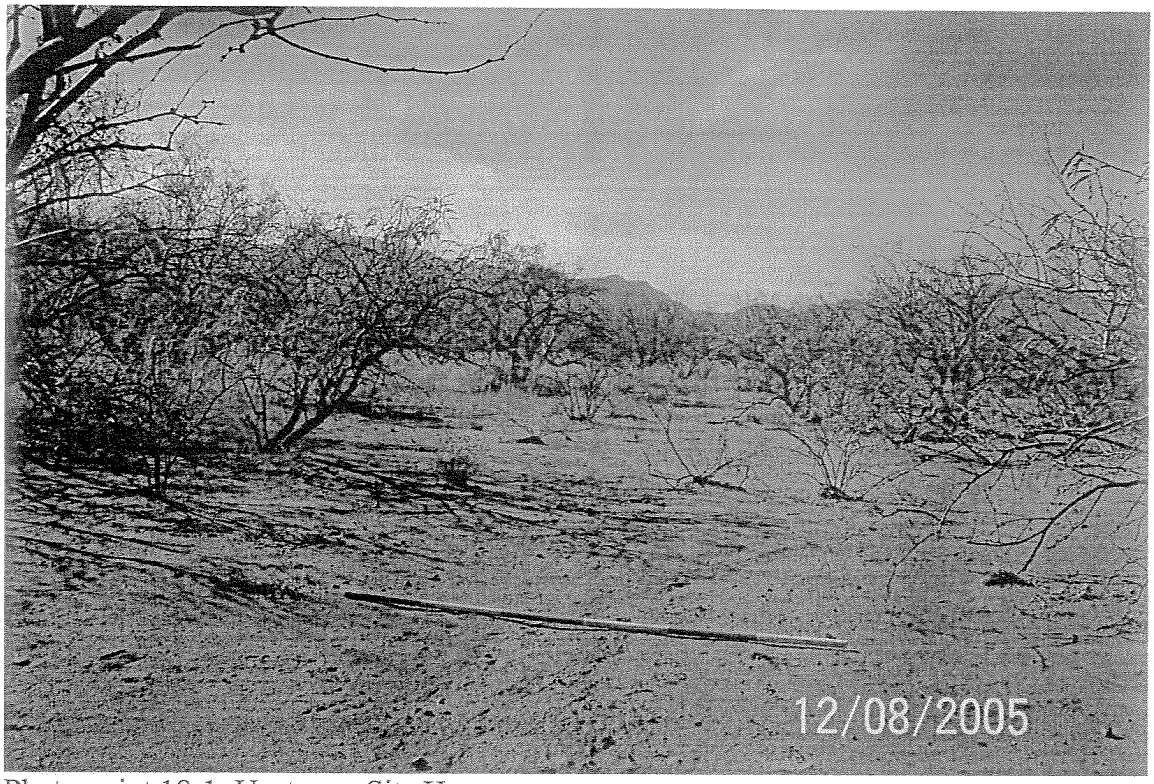

Photo point 18-1: Upstream Site H

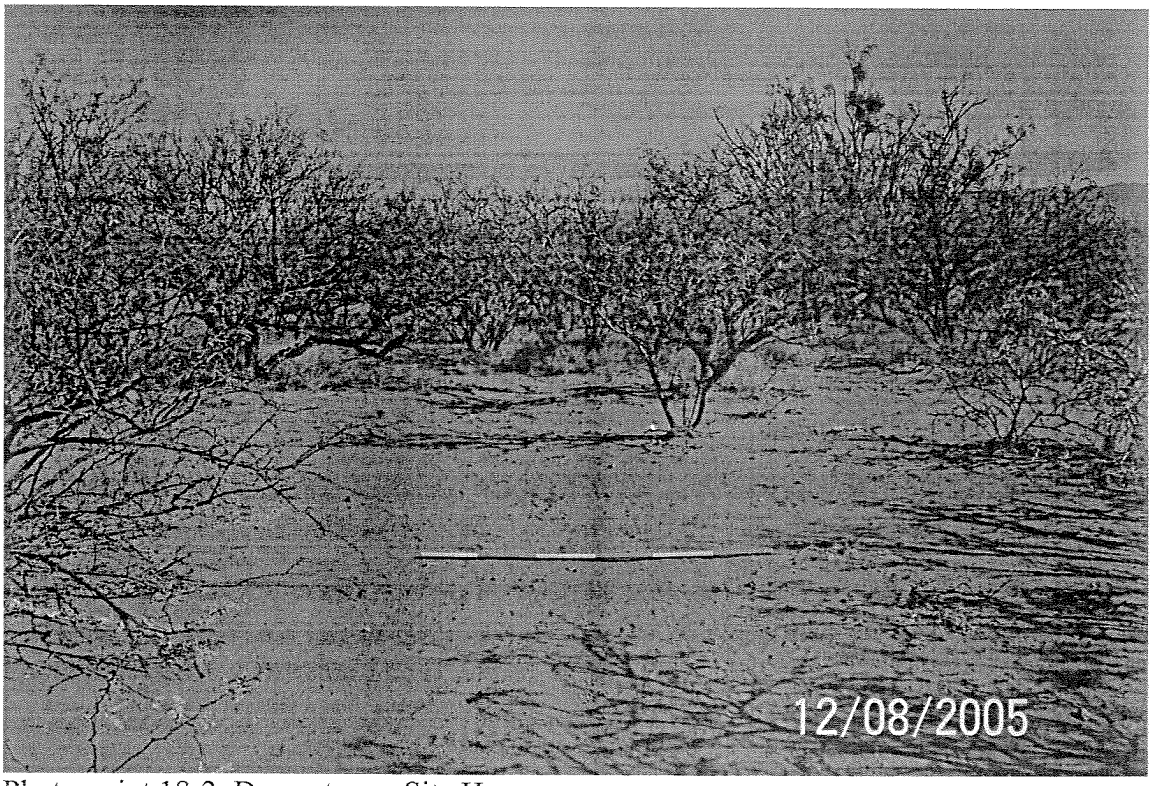

Photo point 18-2: Downstream Site H

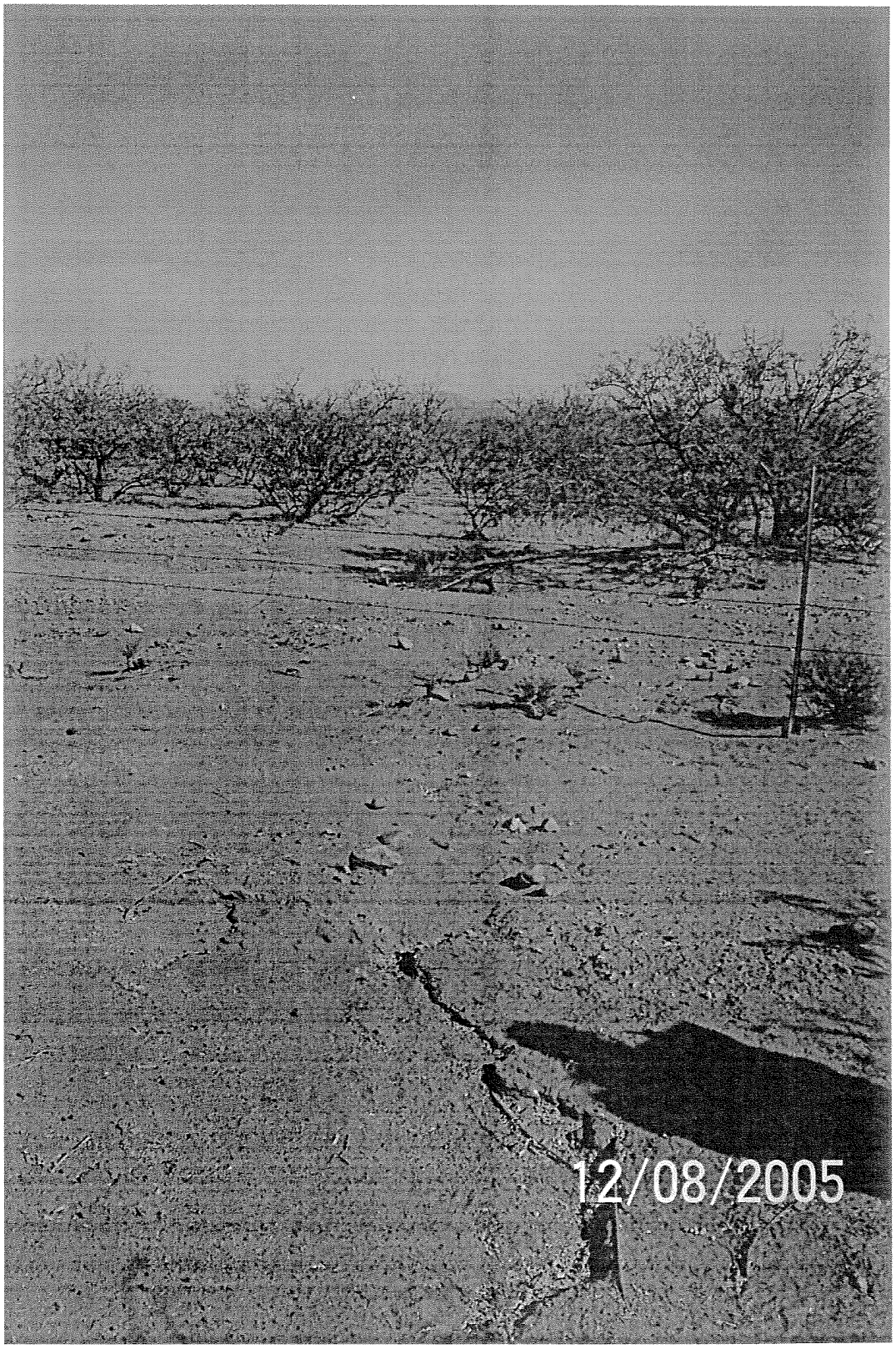

Photo point 18-3: Downstream flow off property. Site H

APPENDIX E:
Vegetation and Sensitive Species Report

Vegetation Communities

The Golden Acres Specific Plan is located within the Semidesert Grassland biotic community. It is characterized by scrub vegetation with an understory of perennial grasses. Through field observations, the following trees and shrubs were found on the site.

Mesquite	*Prosopis velutina*
Whitethorn Acacia	*Acacia greggii*
Catclaw Acacia	*Acacia constricta*
Creosote Bush	*Larrea tridentata*
Soaptree Yucca	*Yucca elata*
Prickly Pear	*Opuntia spp.*

Within this biotic community, the presence of the following perennial grasses could reasonably be expected:

Poverty three-awn	*Aristida divaricata*
Red three-awn	*Aristida longiseta*
Purple three-awn	*Aristida purpurea*
Cane beardgrass	*Bothriochloa barbinodis*
Sideoats grama	*Bouteloua curtipendula*
Black grama	*Bouteloua eriopoda*
Lehmann lovegrass	*Eragrostis lehmanniana*
Green sprangletop	*Leptochloa dubia*
Vine mesquite grass	*Panicum spp.*
Little Bluestem	S*chizachyrium scoparium*
Bristlegrasses	*Setaria spp.*
Wright Sacaton	*Sporobolus wrightii*
Fluffgrass	*Tridens pulchellus*

Tree and shrub species found within the site are in generally fair to poor condition. Much of the mesquite (*Prosopis velutina)* shows evidence of periodic damaging frosts as well as the effects of grazing in the past. This evidence is manifested by the presence of large, old, often-rotted trunks with a small live tree growing out of this trunk. There is also significant dead growth on these trees indicating temperature and drought stress. Whitethorn acacia (*Acacia greggii)* is also showing signs of drought and temperature stress. At the time of field visits, the acacia was mostly void of leaves. Random sampling indicated that 15-20% of the biomass of acacia was dead or seriously stressed. A photo of the typical vegetation is included herein.

There is one wash running through the site, along the northern boundary. This wash has an ill-defined channel with limits that are difficult to ascertain on the ground. Vegetation within the wash zone does not vary by species from the general vegetation found on the site. There is, however, an increase in vegetative density from the surrounding areas when viewed from aerial photos.

There is also one area of significant disturbance. This is the presence of water treatment ponds along the northern edge of the site, near the eastern boundary. This area has been cleared of native vegetation. The presence of invader species such as Desert Broom (*Baccharis sarothroides)* and Bermuda grass (*Cynodon spp.)* could reasonably be expected in this area.

Vegetative densities were measured from aerial photos and confirmed through field observations. The site generally has low vegetative cover with the wash area have medium vegetative cover. A map showing the vegetative densities is included. No areas of high vegetative cover were identified on the site. Vegetative cover does not take into account grasses or other low level vegetation since this vegetation will vary with the season and weather.

APPENDIX F:
Traffic Report

TRAFFIC ANALYSIS

for

GOLDEN ACRES DEVELOPMENT

June 2006

Prepared for:

Engineering and Environmental Consultants, Inc.

Registered Professional Engineer (Civil)
CERTIFICATE NO.
41455
SCOTT D.
BECK
DATE SIGNED 6-29-06
ARIZONA U.S.A.

Prepared by:

Kimley-Horn
and Associates, Inc.

1860 East River Road, Suite 100
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(520) 615-9191

KHA Project # 098094001

TRAFFIC ANALYSIS

for

Golden Acres Development

June 2006

Prepared for:

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Kimley-Horn and Associates, Inc.

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EXHIBIT 2 – SITE PLAN 3
EXHIBIT 3 – GOLDEN ACRES TRIP GENERATION 5
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Kimley-Horn
and Associates, Inc.

TRAFFIC ANALYSIS

INTRODUCTION

This report documents traffic analysis performed for the Golden Acres development located in the Town of Sierra Vista, Arizona. The planned development is located east of SR-92, south of Buffalo Soldier Trail. The development is planned to consist of 1,480 single-family homes and townhomes.

The purpose of this analysis is to determine future roadway laneage requirements for Golden Acres Drive and Glenn Road as well as the timing of roadway widening. It should be noted that this analysis will not include turn lane requirements or level of service analysis at the proposed access points will not result in a Traffic Impact Analysis. A full Traffic Impact Analysis, identifying turn lane requirements, intersection traffic control methods, and level of service per turning movement, will be completed during the Tentative Plat stage. Specifically, this report will:

(1) Evaluate the necessary roadway laneage of Canyon de Flores Road and Glenn Road to service traffic from Golden Acres development and adjacent development

(2) Evaluate the timing of improvements for Canyon de Flores Road and Glenn Road based on the number of houses built.

SITE LOCATION

The planned development is located east of SR-92, south of Buffalo Soldier Trail. The project location is shown in **Exhibit 1**.

SITE PLAN

This development is planned to consist of approximately 1,480 residential units, of which 1,160 are planned to be single-family homes and 320 are planned townhomes. The planned site layout is illustrated in **Exhibit 2**. It is assumed that the site will be initially accessed from Canyon de Flores Road with additional access provided later via Glenn Road.

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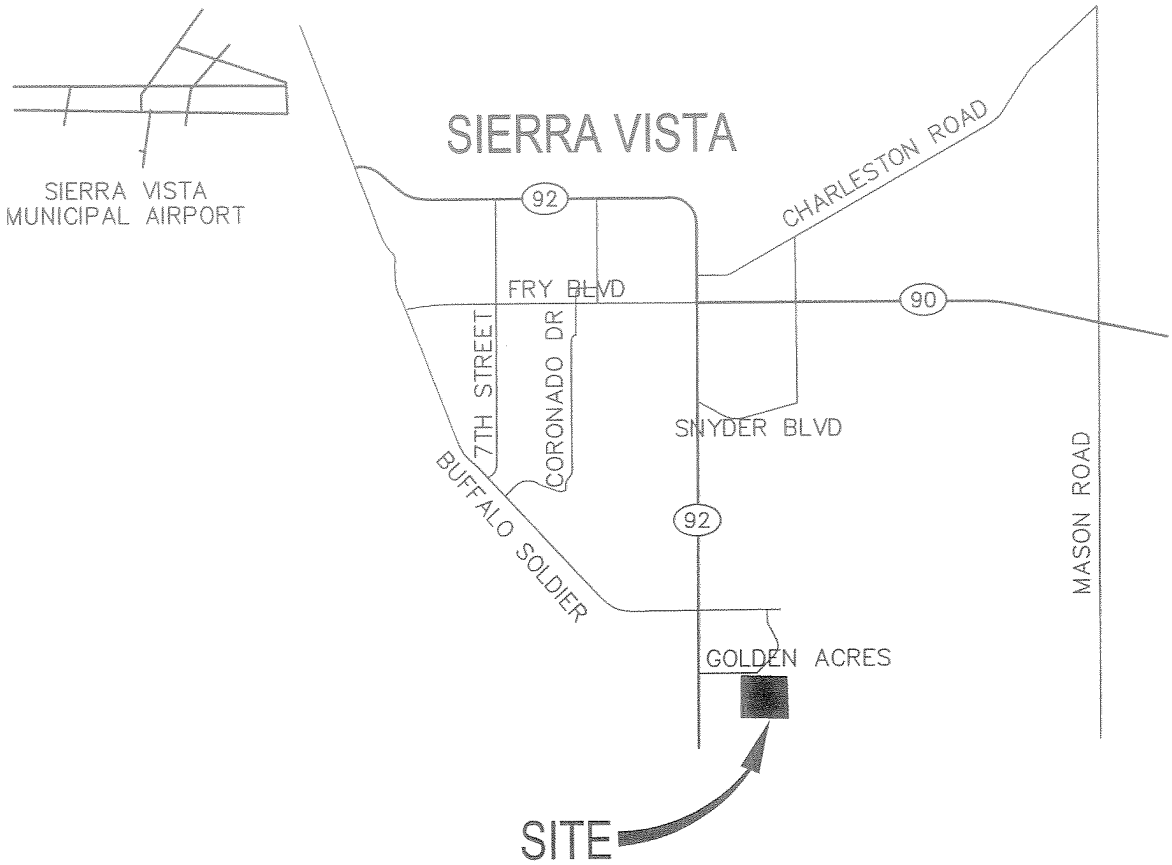
Site Location Map



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NOT TO SCALE

Golden Acres

Exhibit 1

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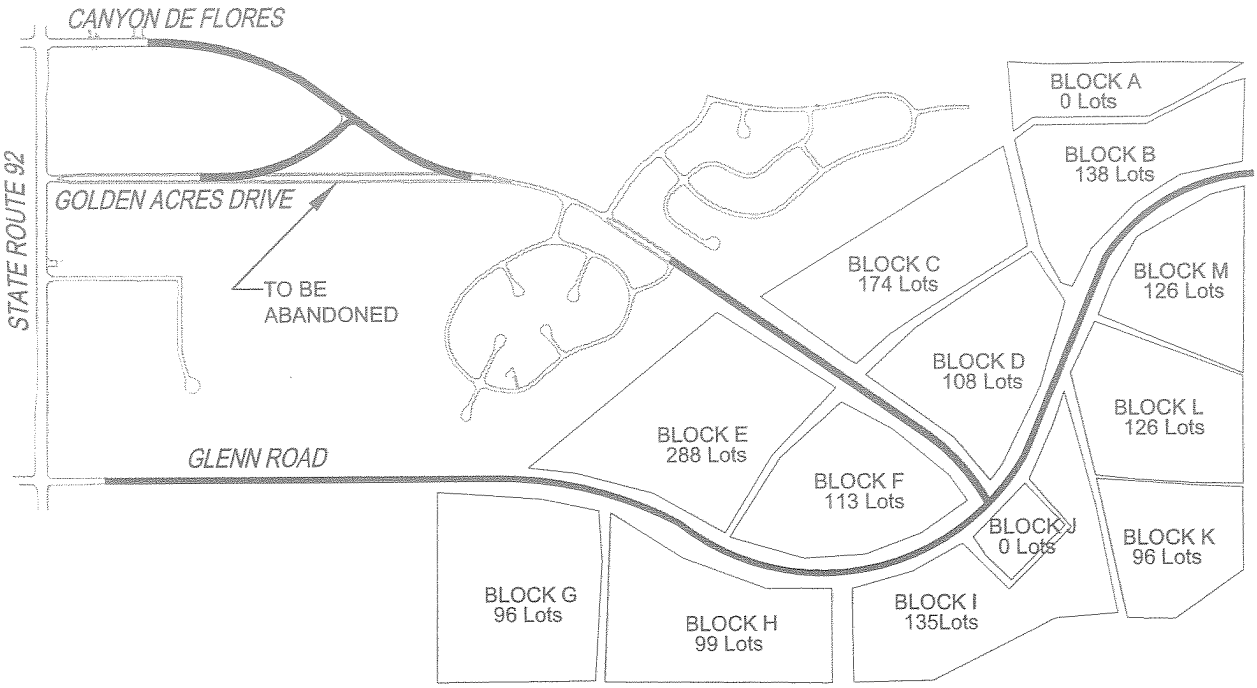
Site Layout



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LEGEND	
———	Existing Roadway
▬▬▬	Future Roadway

Golden Acres

Exhibit 2

ADJACENT LAND USE

Land use near the planned development is primarily residential in nature. There is presently a mobile-home park with 357-units just northwest and adjacent to the planned Golden Acres development. A 357-unit single-family detached housing development is planned to the northwest of the mobile home park along Canyon de Flores. The Pueblo del Sol mobile home / recreational vehicle park is located further west of these developments along Canyon de Flores. The RV Resort is currently closed and the land owner has plans to redevelop the area to provide residential units.

Commercial development is concentrated along the frontage of SR 92.

EXISTING ROADWAY CONDITIONS

The existing roadway network within the study area includes State Route 92, Buffalo Soldier Trail, Canyon de Flores Road, Golden Acres Drive, and Glenn Road. According to Sierra Vista's long range plan (Vista 2020 General Plan, May, 2003): State Route 92 is classified as a principal arterial; Buffalo Soldier Trail is classified as a minor arterial, Glenn Road is classified as a collector, Golden Acres Drive is classified as a residential collector east of the intersection with Canyon de Flores, and Canyon de Flores is classified as a commercial collector.

The following are summaries of the roadways providing access to the planned development:

State Route 92, in the vicinity of the site provides two through lanes in each direction. The facility does not provide sidewalks, curb and gutter, or bike lanes. The posted speed limit is 55 mph. State Route 92 has signalized intersections at Buffalo Soldier Trail, Canyon de Flores Road, and Glenn Road.

Buffalo Soldier Trail, west of State Route-92 provides one through lane in each direction and has a posted speed limit is 45 mph. Buffalo Soldier Trail east of State Route-92 also provides one through lane in each direction but is not a dedicated roadway. It is currently chip-sealed and has no posted speed limit.

Canyon de Flores Road, in the vicinity of the site, provides two through lanes in each direction near SR-92. This roadway currently terminates at the entrance to the Pueblo del Sol RV Resort.

Golden Acres Drive, in the vicinity of the site, provides one through lane in each direction. It provides a wide landscaped median, no sidewalks, curbs, or bike lanes. The posted speed limit is 35 mph.

Glenn Road, in the vicinity of the site, is dirt road leading up to the intersection with State Route-92, where it is paved.

PLANNED ROADWAY ALIGNMENTS

As part of this development, it is planned that Canyon de Flores Road and Golden Acres Drive will be realigned. It is planned that Canyon de Flores Road will be extended eastward to connect with the existing Golden Acres Drive, and that it will serve as access for the existing mobile home park, planned single-family detached housing development, and Golden Acres development. The planned alignment is depicted in **Exhibit 2**.

SITE TRIP GENERATION

The Institute of Transportation Engineers' *Trip Generation, 7th Edition,* was used to obtain daily and peak hour trip generation rates and inbound-outbound percentages, which were then used to estimate the number of daily and peak hour trips that can be attributed to the planned development. Trip generation characteristics for Golden Acres at buildout are shown in **Exhibit 3**.

EXHIBIT 3 – GOLDEN ACRES TRIP GENERATION

Land Use	Intensity	Units	Daily Total	AM Peak			PM Peak		
				In	Out	Total	In	Out	Total
Single-Family Detached Housing	1,160	DU	9,884	205	616	821	616	361	977
Residential Condominium/Townhouse	320	DU	1,725	44	212	256	105	51	156
TOTAL			**11,609**	**249**	**828**	**1,077**	**720**	**413**	**1,133**

Single-Family Detached Housing

ITE 7th Edition:	**210**		
Daily	Ln(T) = 0.920 Ln(Dwelling Units) + 2.71	50% In	50% Out
AM Peak Hour	T = 0.700*(Dwelling Units) + 9.43	25% In	75% Out
PM Peak Hour	Ln(T) = 0.90 Ln(Dwelling Units) + 0.53	63% In	37% Out

Residential Condominium/Townhouse

ITE 7th Edition:	**230**		
Daily	Ln(T) = 0.85 Ln(Dwelling Units) + 2.55	50% In	50% Out
AM Peak Hour	Ln(T) = 0.80 Ln(Dwelling Units) + 0.26	17% In	83% Out
PM Peak Hour	Ln(T) = 0.82 Ln(Dwelling Units) + 0.32	67% In	33% Out

As shown in Exhibit 3, trip generation at buildout results in 11,609 daily trips with 1,077 occurring in the AM peak hour and 1,133 occurring in the PM peak hour.

BACKGROUND TRIP GENERATION

In order to evaluate roadway needs, background traffic was developed for existing and planned development in the study area. The existing 357-unit mobile home park (adjacent and north of the proposed development) and the planned 357-unit single-family housing development (adjacent and north of the mobile home park) were considered for the purposes of this analysis. Since the primary purpose of this report is to examine roadway capacity needs to accommodate the proposed Golden Acres development, traffic generation related to the commercial development along SR-92 and the Pueblo del Sol RV Resort were not considered as they are located east of the planned intersection of Golden Acres Drive and Canyon de Flores Road. However, these land uses will be taken into consideration upon completion of the full Traffic Impact Analysis.

The Institute of Transportation Engineers' *Trip Generation, 7th Edition,* was used to obtain daily and peak hour trip generation rates and inbound-outbound percentages, which were then used to estimate the number of daily and peak hour trips that can be attributed to the background development. Background trip generation characteristics are shown in **Exhibit 4**.

EXHIBIT 4 – BACKGROUND TRIP GENERATION

Land Use	Intensity	Units	Daily Total	AM Peak			PM Peak		
				In	Out	Total	In	Out	Total
Single-Family Detached Housing	357	DU	3,343	65	194	259	213	125	338
Mobile Home Park	357	DU	1,534	22	90	112	128	78	206
TOTAL			4,877	87	284	371	341	203	544

Single-Family Detached Housing

ITE 7th Edition:	**210**		
Daily	Ln(T) = 0.920 Ln(Dwelling Units) + 2.71	50% In	50% Out
AM Peak Hour	T = 0.700*(Dwelling Units) + 9.43	25% In	75% Out
PM Peak Hour	Ln(T) = 0.90 Ln(Dwelling Units) + 0.53	63% In	37% Out

Mobile Home Park

ITE 7th Edition:	**240** 0		
Daily	T = 3.52(Dwelling Units) + 277.51	50% In	50% Out
AM Peak Hour	Ln(T) = 0.64 Ln(Dwelling Units) + 0.96	20% In	80% Out
PM Peak Hour	T = 0.57(Dwelling Units) + 2.06	62% In	38% Out

As shown in Exhibit 4, background trip generation results in 4,877 daily trips with 371 occurring in the AM peak hour and 544 occurring in the PM peak hour.

It should be noted that the existing traffic volumes along Glenn Road were deemed insignificant at this time and were not included in the analysis. In addition, the area to the south of the planned Golden Acres development is low density residential. It is not anticipated that cut through traffic would be significant enough to materially change the analysis.

ROADWAY NEEDS

Analysis was first completed to determine the maximum number of houses that could be built while maintaining Canyon de Flores Road as a 2-lane roadway east of Golden Acres Drive. According to the Florida Department of Transportation *2002 Quality / Level of Service Handbook,* a typical roadway of this function has a capacity of 10,000 vehicles per day. Of the land uses analyzed, the 357-unit mobile home park and 357-unit single-family housing development represented in the Background Traffic section would make almost exclusive use of Canyon de Flores Road for access. These developments alone would constitute an average daily trip volume of 4,877 along Canyon de Flores Road. As such, approximately 560 single-family homes could be built within the Golden Acres development before exceeding the roadway capacity of 10,000 vehicles per day along a two-lane Canyon de Flores Road. This analysis takes into consideration only traffic volumes and capacity and not the structural integrity of the existing roadway.

At full buildout, Golden Acres development will require more access than a 2-lane Canyon de Flores Road. The extension of Glenn Road as a two-lane undivided road would add an additional capacity of 10,000 vehicles a day. Based on the layout of Golden Acres development, it was assumed that 55% of Golden Acres development trips would access SR-92 via Canyon de Flores Road, and 45% would use Glenn Road for SR 92 access. At buildout, this results in approximately 6,400 site-generated vehicle trips on Canyon de Flores and approximately 5,200 site-generated vehicle trips on Glenn Road per day. As such, the total daily traffic volumes along Glenn Road are anticipated to be approximately 5,200 and thus a two-lane facility will be sufficient in terms of roadway capacity. The average daily traffic volumes along Canyon de Flores east of Golden Acres Drive are anticipated to be approximately 11,320 requiring a four-lane facility to meet capacity needs. Average daily traffic volumes and background developments considered in the analysis are shown in **Exhibit 5**.

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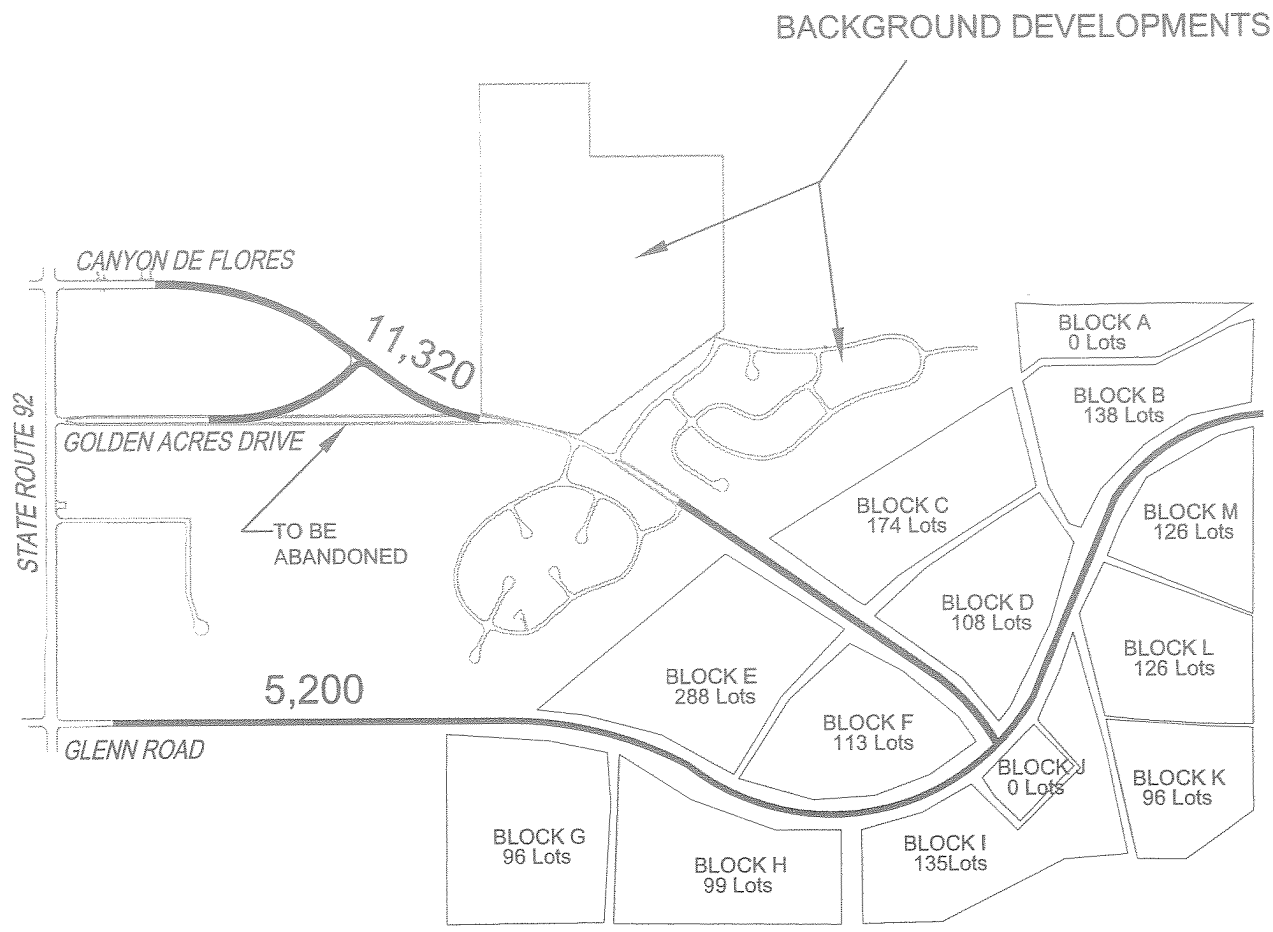
Total Volumes



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LEGEND	
	Existing Roadway
	Future Roadway
###	Daily Traffic Volume

Golden Acres

Exhibit 5

It should be noted that the above roadway analysis is limited to Canyon de Flores immediately east of the intersection with Golden Acres Drive. Commercial and residential development west of the analysis section will generate additional traffic; however, Golden Acres Drive would provide additional access and capacity for this traffic. Additional analysis related to this area will be completed during the Tentative Plat stage.

The above analysis does not consider additional access to Buffalo Soldier Trail. If future access is provided, traffic volumes along Canyon de Flores Road resulting from Golden Acres development will be less than reported herein.

CONCLUSIONS

- The estimated number of trips generated at buildout of Golden Acres development results in 11,609 daily trips, with 1,077 occurring in the AM peak hour and 1,133 occurring in the PM peak hour.
- Approximately 560 homes of the Golden Acres development could be built before exceeding the 10,000 daily vehicle trip capacity of a 2-lane, undivided Canyon de Flores Road.
- The Golden Acres development is expected to generate approximately 6,400 site-generated vehicle trips on Canyon de Flores and approximately 5,200 site-generated vehicle trips on Glenn Road per day.
- Total daily traffic volumes along Glenn Road are anticipated to be approximately 5,200 and thus a two-lane facility will be sufficient in terms of roadway capacity. The average daily traffic volumes along Canyon de Flores east of Golden Acres Drive are anticipated to be approximately 11,320 requiring a four-lane facility to meet capacity needs.