HYDROLOGIC, HYDRAULIC AND PLATTING REVIEW OF SANDIA HEIGHTS SOUTH AND NORTH ALBUQUERQUE ACRES

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Prepared For The

Albuquerque Metropolitan Arroyo Flood Control Authority (AMAFCA)

in Cooperation With **Bernalillo County**

Albuquerque
Metropolitan
Arroyo
Flood
Control
Authority

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MEMORANDUM

November 3, 1995

TO: Distribution List

Fr: Kurt Browning, AMAFCA

RE: Platting Review of Sandia Heights South and North Albuquerque Acres

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Please find enclosed a copy of the referenced report. As stated in the cover letter, this report provides a comprehensive overview of the hydrologic ramifications regarding platting in this area. With continued development, both of these areas will be facing drainage issues that will need to be addressed.

The report contains valuable information regarding the history, policies, ordinances and resolutions that affect this area.

Distribution-

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1.0 BACKGROUND AND STATEMENT OF PURPOSE

1.1 General

In recent years, the County of Bernalillo and the Albuquerque Metropolitan Arroyo Flood Control Authority (AMAFCA) have been faced with increasing drainage and flooding complaints from the public in the Sandia Heights South and North Albuquerque Acres subdivisions. These areas are impacted by the major arroyo systems, including the La Cueva Arroyo, North and South Domingo Baca Arroyo, and the Pino Arroyo, which originate in the Sandia Mountains. Development in these areas has not occurred uniformly, resulting in a "checkerboard" of plats approved under different authorities and criteria. Confusion over the development history, drainage criteria, and platting associated with this area has necessitated further assessment of the needs and possible solutions to the problems experienced by existing and future landowners. This report is intended to help both technical and non-technical readers better understand the potential flooding problems in the existing developments. It also includes a brief review of the development history and ordinance requirements of these areas of Bernalillo County.

1.2 Background

Sandia Heights South and North Albuquerque Acres comprise a portion of the Elena Gallegos Grant, located in the northeast quadrant of the City of Albuquerque metropolitan area. The portion of the North Albuquerque Acres addressed in this report is bounded on the north by the Pueblo of Sandia Indian Reservation, on the south by San Antonio Boulevard and on the west by Eubank Boulevard. For this study, the portion of North Albuquerque Acres west of Eubank Boulevard is not included in the analysis and the study area is outside the Albuquerque City limits. Sandia Heights South extends east from Tennyson Street to the open space boundary

in the Sandia Mountain foothills. Sandia Heights South and North Albuquerque Acres are divided by Tennyson Street. Figure 1 shows the general site location.

In the last 60 years, the State of New Mexico has undergone a significant change in its population. In 1930, the population was estimated at around 423,000 people. By 1960, the population had increased to 951,023 and by 1980 it had grown to approximately 1,266,600. As of 1990, the growth had reached over 1,500,000 residents. It has been projected that by the year 2000, New Mexico will have more than two million residents, Bernalillo County 555,000, and the City of Albuquerque over 700,000 according to the UNM Bureau of Business and Economic Research.

The increase in Albuquerque's population has resulted in an increased demand for housing and land development. It is, therefore, not surprising that owners of large parcels of land have found it highly profitable to subdivide and sell their land in small parcels to this growing market. Unfortunately, many of the earlier subdivisions were created without regard for a number of development factors. While right-of-way for roads was considered, historically, drainage was not. Development often resulted in greater stormwater runoff volume with higher velocities than had existed before.

Existing subdivisions and drainage plans, where they were developed, met requirements at the time of development. However, they were not comprehensive enough. Erosion, sedimentation, and lack of provision for drainage in existing subdivisions has been a major concern. Lack of drainage regulation at the time of plat development is the source of many of the drainage problems. Common problems include:

- Evaluating only the largest watersheds and ignoring less frequent drainage problems;
- Ignoring the potential for increase runoff due to incremental development;

- Failure to consider the effects of road construction; and
- Failure to consider the short and long term effects of sediment deposition and erosion.

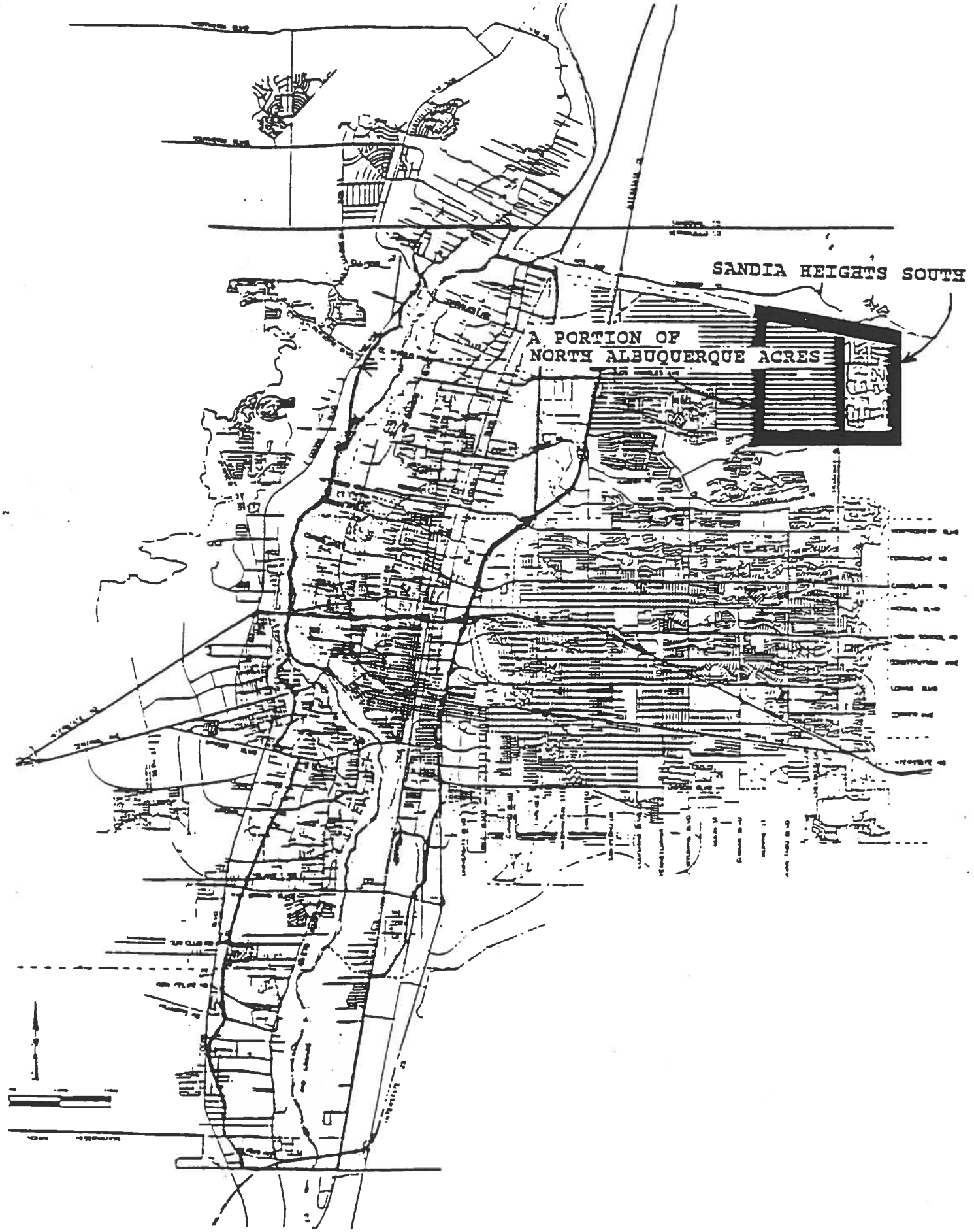

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FIGURE 1 - General Site Location Map

2.0 PLANS AND POLICIES IMPACTING PROJECT AREA

The Albuquerque Metropolitan Arroyo Flood Control Authority (AMAFCA) is a local government agency, organized as a quasi-municipal corporation and a political subdivision of the State of New Mexico. AMAFCA was created in 1963 by the "Arroyo Flood Control Act" [72-16-1 to 72-16-103 NMSA 1978] to protect persons and property from floods. Its boundaries include the City of Albuquerque and neighboring areas in Bernalillo County. AMAFCA is governed by a five-member Board of Directors who are elected for overlapping six-year terms. Although not a part of the City or County governments, AMAFCA works closely with both.

Initially, AMAFCA's primary goal was to provide local sponsorship for construction of the North and South Diversion Channels, a U.S. Army Corps of Engineers project. These "Twin Ditches" protect downtown Albuquerque and valley communities from mountain and mesa floodwaters. The project stands as a monument to federal-local cooperation.

Recently, AMAFCA has planned, designed and built a series of stormwater detention dams, channels and dikes within the project area. These projects, designed to protect existing structures and facilitate future development, are generally located in the vicinity of Tramway Boulevard.

AMAFCA collects property taxes to construct and maintain flood control facilities. These taxes have remained essentially the same since 1975. Fiscal policy is conservative. AMAFCA has never issued bonds for longer than ten years, thereby reducing interest payments and making more money available or flood control.

Six major plans have impacted the project area, including:

- Albuquerque/Bernalillo County Comprehensive Plan; (1988) (adopted by Bernalillo County and the City of Albuquerque);
- Subareas Master Plan for the Developing Urban Area of North Albuquerque Acres (1978) (adopted by Bernalillo County and the City of Albuquerque);
- Facility Plan For Arroyos (1985) (adopted by Bernalillo County and the City of Albuquerque and endorsed by AMAFCA);
- Northeast Heights Drainage Management Plan (1975) (adopted by AMAFCA);
- North Albuquerque Acres Comprehensive Plan Amendment Study (1987) (adopted by Bernalillo County); and
- La Cueva High School Land Use Guide (1986) (adopted by the City of Albuquerque and Bernalillo County).

The major points of these plans are summarized below.

The Comprehensive Plan was designed to "preserve the unique natural feature of the metropolitan area by achieving a pattern of development and open space respecting the river lands, mesas, mountains, volcanoes and arroyos"; and to "provide a quality urban environment which perpetuates the tradition of identifiable, individualistic communities within the metropolitan area and offers variety and maximum choice in housing, work areas, and lifestyles, while creating visually pleasing architecture, landscaping, and vistas to enhance the appearance of the community."

This Plan includes a "Metropolitan Areas and Urban Centers Plan" which designates a portion of the project area as a Developing Urban Area, requiring three to six dwelling units per gross acre, and extended urban services. The emphasis in a Developing Urban Area is on planning for large areas or sectors to provide a variety of housing types and other land uses, along with appropriate open space. Cluster housing and planned unit development are generally

used to maximize comprehensive planning goals.

The Subareas Mater Plan for the Developing Urban Area of North Albuquerque Acres, 1978 recognizes that obsolete platting, drainage patterns, topography, and diverse land ownership have been serious impediments to urban development in North Albuquerque Acres. This Plan was designed to serve as "a guideline for private development and for the location and sequence of public improvements." The plan also prescribes requirements for development and, most importantly, states that no development should occur in North Albuquerque Acres until sector development plans are adopted for the subareas. The Plan divides the entire area into subareas based upon drainage concerns and topography, making the subareas quasi-independent development areas which could be sequenced for development through private initiative sector development plans.

The Facility Plan For Arroyos (1985) discusses the multiple-use of Albuquerque's arroyos and their floodplains and designates the Las Cueva Arroyo as a major open space link. As such a link, the drainageway could also serve as a recreational connection between the Sandia's slopes and the Rio Grande bosque. The South Domingo Baca Arroyo was designated as a major arroyo, but the North Domingo Baca Arroyo was not addressed by the Plan. The Plan, which has been adopted by the County of Bernalillo and the City Council, as was endorsed by AMAFCA, does not discuss the drawbacks to the existing platting or the insufficient drainage facilities in the project area.

This Plan give direct attention to the health, safety, and welfare impacts of development in flood hazard zones. The Pino, the North and South Domingo Baca and La Cueva Arroyos are shown by current Federal Flood Hazard Maps to have 100-year floodways that will require attention prior to development. The flood hazard maps were prepared as part of a Flood Insurance Study (FIS)

conducted by Bohannon-Huston in 1983.

Recognizing that preventing drainage problems before they occur is an effective way to optimize urban drainage expenditures, AMAFCA in 1973 undertook the development of a major drainage management plan for the area north and east of Albuquerque. This area included the Sandia Heights South area and the largely undeveloped North Albuquerque Acres area.

In August of 1974, after several public hearings and review by interested parties, AMAFCA stated its intent to proceed with the "Northeast Heights Drainage Management Plan" prepared by Leonard Rice Consulting Water Engineers, Inc. The selected plan emphasized detention storage and combining arroyos to minimize right-of-way requirements. Channels followed natural alignments using soft-lined channels with drop structures.

A high flood potential created by the Sandia Mountains on the east, along with the transient character of the arroyos draining the area, necessitated that drainage planning proceed and be coordinated with other planning for the area. AMAFCA initiated a two-phase drainage management study for the area to provide a cost-effective method of integrating major drainage with other urban systems as the area develops. Some of the recommendations presented in the "Leonard Rice" study include:

- Enact a floodplain regulation to protect existing drainageways from encroachment until the drainage management plan is implemented;
- Reserve areas below detention dams as open space for spillway discharges;
- Construct flood control dikes to prevent interbasin transfer of flood flows;
- Enact sediment and erosion control regulations;
- Plan developing areas east of I-25 to minimize runoff. Between the diversion channel and I-25, drainage planning should convey local runoff to the diversion channel as rapidly as possible;

- In most new areas, construct streets along the contours. The area between the diversion channel and I-25 is the exception; and
- Review the existing policies of cost sharing for major drainage facilities between private developers and public agencies.

These recommendations have not been fully implemented. The Leonard Rice study did not address the local drainage issues that currently plague the land owners of Sandia Heights South or North Albuquerque Acres. The suggestions are valid and would be of some help in the area, but most of them fall short of addressing problems with the existing land ownership pattern and trying to develop realistic solutions. In North Albuquerque Acres, the combination of the grid patterned platting and the numerous land owners creates a dilemma that will require large scale coordination to eliminate the existing flood hazards.

In 1983, the Flood Insurance Study for the City of Albuquerque and Bernalillo County was instituted. The Federal Emergency Management Agency (FEMA), as the agency responsible for administration of the National Flood Insurance Program (NFIP), conducts hydrologic and hydraulic analyses to determine the magnitude of the flood risk in communities throughout the United States. Those analyses, performed under FEMA guidelines by private engineering firms and Federal and State agencies, are based on standard engineering practices and yield the flood information (including base (100-year) flood elevations, flood risk zones, and floodplain and floodway boundary delineations) shown on NFIP maps.

FEMA recognizes that NFIP maps require changes from time to time as a result of proposed development in previously unstudied areas, floodplain and watershed changes, or improvements in the techniques used for assessing flood risk. Citizens and local governments play an important role in keeping NFIP maps technically sound and up to date as conditions change in their communities. With increasing land-development pressure, the growth of

Location and design studies have been accomplished for the proposed Paseo del Norte limited access facility. Because of the impending construction of the facility and the anticipated corresponding land development along the roadway corridor, AMAFCA developed a Drainage Management Plan for the North and South Domingo Baca Arroyos whose watersheds include the Paseo del Norte corridor (see Figure 2). The recommended projects affecting this study are:

- A 5-ft diameter storm sewer in Paseo del Norte and Lowell Street to divert runoff into the South Domingo Baca reservoir.
- A 3.5-ft to 4-ft diameter storm sewer in Paseo del Norte and north into North Domingo Baca reservoir.
- A 4.5-ft diameter storm sewer in Lowell Street from San Francisco Road to South Domingo Baca reservoir.
- A 4-ft to 5-ft diameter storm sewer in Palomas Avenue and Eubank Boulevard.
- A 4-ft to 6.5-ft diameter storm sewer in Coronado Avenue between Lowell and Browning and Eubank Boulevard, and in Eubank Boulevard.

The roadway design includes the recommended storm sewers in the roadway right-of-way.

The alignment termini for the Alameda Boulevard principal arterial have been identified. The Primrose Point development has provided for this facility to pass through the development in Phase IV from Cedar Hill Road at Tennyson Road west to Lowell Road at Wilshire. This facility will pass immediately north of the North Domingo Baca Dam and will necessitate that the drainage plan, when developed, consider the AMAFCA Drainage Management Plan.

3.0 DEVELOPMENT ORDINANCES AND RESOLUTIONS

The New Mexico Legislature has enacted important subdivision laws that were designed to provide local counties and municipalities with the authority to regulate and control land subdivision activity within their jurisdictions. These laws protect the New Mexico environment as well as the purchasing public. Under these laws, various state agencies are given the responsibility of advising local, city, and county officials on such diverse subjects as water quality and quantity, sewage disposal, and soil erosion. However, the subdivision process has become complicated and often confusing, with overlapping jurisdictional authority being asserted by various state, federal, county, and municipal authorities. Since the New Mexico subdivision laws are administered at the local level, interpretations of the state statutes have often varied from one county to another. What follows is a brief overview of the history of New Mexico's subdivision ordinances.

3.1 Subdivision Ordinance History/Chronology

The New Mexico Legislature first addressed the problems of subdivision planning in New Mexico Laws 1884, Chapter 39, Sections 6 and 7. Authority to plan for and regulate land use has been historically conferred on local municipalities and counties by a series of enabling statutes. Municipalities were given the power to zone as early as 1927, but were not authorized to create a municipal planning commission until 1947. The counties of New Mexico were not granted zoning powers until 1959 and only then if the counties had populations over 25,000 people. Full zoning power was finally granted to the counties in 1965, and the counties were given authority to form planning commissions in 1967.

Express authority to regulate subdivisions and promulgate regulations was first given to the New Mexico municipalities in 1947. This law, repealed and rewritten in 1965, conferred broader regulatory authority over subdivisions in municipalities under the "Municipal Code." Similar regulatory authority was not granted to the counties until 1973 with the passage of the New Mexico Subdivision Act; this authorized counties to promulgate subdivision regulations (See Section 3.3). Prior to that law, developers outside the jurisdiction of municipalities had only to comply with minimal statutory requirements concerning streets and boundary lines to gain approval for subdivision plat maps from the Board of County Commissioners.

3.2 The 1963 Land Subdivision Act

Prior to the enactment of the Land Subdivision Act by New Mexico Laws, 1963, Chapter 217, Section 1, there were no meaningful review and approval requirements for county subdivisions empowered to county commissions or any state agency, and there were no laws providing consumer protection for purchasers of subdivided land in the counties. With the advent of large, new, master planned cities and the mass marketing of county subdivisions, regulation became a necessity.

The New Mexico Legislature's first comprehensive attempt to manage and control land subdivision activity and sales within the unincorporated areas of the counties was the 1963 Land Subdivision Act. That statute was primarily a response to efforts by major land development companies to create large new communities, and to market retirement investment lots on a large scale to out-of-state buyers. The statute contained new advertising and disclosure standards and criminal sanctions against fraudulent misrepresentations made in the sale of the subdivided land. However, the Land Subdivision Act provided few performance standards and no regulatory

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authority for the counties. The approval of a subdivision under this statute was a ministerial act performed by the county if certain minimal physical requirements were complied with regarding the preparation of the survey plat map and the staking of boundaries. It required that before a plat of any subdivision with the jurisdiction of a county was filed with the County Clerk, the plat had to be reviewed by the county to insure that it met the following requirements:

1. The proposed streets conformed to adjoining streets;

2. The streets were defined by permanent monuments to the satisfaction of the Board of County Commissioners; and

3. The boundaries of the subdivision were defined by permanent monuments.

The plat had to be certified by a licensed, registered land surveyor and had to contain a description of the subdivided land with ties to permanent monuments. No other requirements, such as drainage, were allowed.

Although not a requirement for approval, it was unlawful to sell subdivided land until legal access from an existing public way to each lot had been dedicated and accepted by the Board of County Commissioners. Dedication and acceptance of roads by the county did not include acceptance for maintenance.

The 1963 Subdivision Act did not address drainage, flood control, or drainage easements. The counties had no authority to promulgate regulations governing the type and quality of the subdivisions under this statute.

3.3 1973 New Mexico Subdivision Act

In 1965, the Legislature enacted the "Municipal Subdivision Act," which granted to the municipalities the power and authority to approve and disapprove subdivisions within their

boundaries. In 1973, the New Mexico Legislature passed the New Mexico Subdivision Act which granted similar regulatory authority to the counties. Both of these statutes provided significantly more platting and planning jurisdiction to both the cities and counties, and allowed them to control growth and development of subdivisions within their jurisdictions.

The 1973 New Mexico Subdivision Act governed the division of the surface of an area of land in New Mexico which has been divided by a subdivider into five or more parcels within three years for the purpose of sale or lease. This act was amended in 1981.

Subdivisions which were platted and approved under the 1963 Land Subdivision Act were not subject to the new requirements imposed under the 1973 New Mexico Subdivision Act. Therefore, as long as a subdivision originally approved under the 1963 New Mexico Land Subdivision Act remained in compliance with all of the applicable statutory requirements of those laws, the approval of the subdivision could not be revoked or suspended, or additional requirements imposed by the county for maintaining such approval with respect to existing unsold lots.

Specific drainage or flood control criteria were not addressed in the 1973 New Mexico Subdivision Act.

There were also many subdivisions which had been platted and filed under statutes older than the 1963 Land Subdivision Act and the 1947 Municipal Subdivision Act. Where such plats showed approval by the city or county on the plat map, the subdivider or the subsequent owner of the subdivision had a vested right to continue to sell unsold lots in that subdivision and was exempt from complying with the newer requirements. The vested right to sell an older "subdivision" without compliance with newer subdivision laws and regulations depended entirely upon whether the plat map for the subdivision was ever approved by the city or county authority

as a "subdivision." The mere fact that the plat was filed with the County Clerk was not enough.

3.4 Subdivision Ordinance Amendments After April 6, 1981

The 1981 amendment to the 1973 New Mexico Subdivision Act authorizes the county to accept maintenance responsibility only if the subdivider constructs the roads to county specifications. The statute mandated that the plat include a statement that the subdivider agree to build the roads in conformance with county regulations. This provision also clarifies the fact that dedication of roads for public use does not automatically impose a corresponding duty upon the county to maintain the roads.

Provisions for terrain management were also required to be given in both the disclosure statement and in information to the Board of County Commissioners. The terminology, "terrain management," as used in the amended ordinance, was defined as the control of floods, drainage, and erosion, and measures required for adapting proposed development to existing soil characteristics and topography.

Planning for growth in New Mexico now takes place at four distinct levels: state, regional, county, and municipal. However, the primary authority for planning and flood control is at the county and municipal level.

Bernalillo County has adopted and taken control of the subdividing of land since the 1973 statutes allowed them to do so. The 1974 subdivision ordinance, updated in 1980, addresses drainage and flood control problems and provides guidance for developers. The need to update the old ordinance and create a more clearly defined approval process was considered as the solution to the drainage problems associated with past expansion. Some of the updated criterion for subdivisions that were adopted in the Street Standards Ordinance (Ordinance No. 88-42) and

pertinent to flood control are as follows:

- "Where a subdivision, land division, or site development is traversed by a watercourse, drainageway, channel, or stream, a storm water easement or drainage right-of-way shall be provided which conforms substantially with the lines of the 100-year storm watercourse, and further width or construction, or both as will be adequate for the purpose and shall conform substantially to an approved drainage plan for the area."

- "All easements are to be in a form as specified and approved by the County Engineer, the County Attorney, and where applicable, by AMAFCA. In general, the easement format shall follow the City format for easements."

- "The County Planning Commission on the recommendation of the County Engineer may require private ways to include public or private utility easements, including easements for stormwater drainage."

- "In cases where the impact of a development requires improvements to offsite transportation facilities accessing a development and these improvements are determined to be necessary for Public Safety or for traffic operations, the developer shall bear the cost of minimum improvements recommended by the County Engineer and approved by the County Planning Authority. Such improvements, such ass major drainage crossing structures, traffic lighting, and resurfacing or reconstruction of the facility."

- "Arterial, collector and sole access streets to subdivisions may not employ at-grade or dip section crossings of arroyos."

3.5 County Drainage Ordinances

The County's first "Flood Damage Prevention Ordinance" was No. 81-36 adopted November 3, 1981, and incorporated the "Flood Hazard Boundary Map" (FHBM) issued by the Federal Insurance Administration in 1977. Ordinance No. 88027 also known as the "Flood Damage Prevention Ordinance" made concomitant changes in the original ordinance and adopted the FIS dated March 1983. Additional changes mandated by FEMA in 1987 have resulted in the present "Flood Damage Prevention Ordinance" No. 88-46. The general provisions of Ordinance 88-46 includes methods and provisions for:

1. Restricting or prohibiting uses which are dangerous to health, safety, and property due to water or erosion hazards; or which result in damaging increases in erosion or in flood heights or velocities;

2. Requiring that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction;

3. Controlling the alteration of natural flood plains, stream channels, and natural protective barriers which help accommodate or channel flood waters;

4. Controlling filling, grading, and other development which may increase flood damage; and

5. Preventing or regulating the construction of flood barriers which will unnaturally divert flood waters or which may increase flood hazards in other areas.

The 1990 "Bernalillo County Storm Drainage Ordinance" (90-6) was written to complement and supplement Ordinance 88-46 and currently contains the flood control requirements for current development.

An important aspect of this ordinance with respect to the drainage of Sandia Heights South and North Albuquerque Acres is in Section 11F. This states that drainage information requirements for building permits will be waived where a drainage report meeting the requirements of this ordinance have been previously approved by Bernalillo County or AMAFCA and a copy of said report is on file with the County Engineer.

The Bernalillo County Storm Drainage Ordinance constitutes the following provisions which are of particular interest in the Study area:

"The County Engineer is responsible for establishing criteria, procedures and standards for design and construction of flood control, drainage control and erosion control improvements within the County of Bernalillo."

"Except as allowed by AMAFCA Resolution 81-8 and amendments thereto, the dedication of land for public purposes does not relieve a developer of responsibilities for

the construction of drainage control, flood control and erosion control facilities that would otherwise be necessary. The dedication of rights-of-way or easements for drainage control, flood control or erosion control facilities does not relieve a developer of responsibilities that would otherwise exist for the construction of other public infrastructure."

"A "Prudent Line" also referred to as an "Erosion Limit Line" means that line which will not be disturbed by erosion, scour, or meandering of a natural (unlined) arroyo, channel or watercourse over a period of thirty (30) years and which will not be disturbed by a 100-year storm occurring at any time during the 30 year period. The prudent line shall be so located as to include all free board required to contain the wave action of the 100- year design storm."

Bernalillo County Public Works has recently established a checklist (02-29-91) that shows the requirements for building permit requests in the County for properties adjacent to a 100-year floodplain. Because any development next to an arroyo affects the City, County, and AMAFCA, this checklist will serve as a guideline for consultants when dealing with the three agencies.

In addition to the requirements established in Ordinance 90-6, the checklist includes provisions for erosion limits and building setbacks. The building setback requirements for 100-year floodplains must follow three setback requirements to serve as a guide to provide protection for long term meandering of the arroyo:

1. A setback of six feet for each 100 cfs, or fraction thereof that the arroyo carries during a 100-year storm.

2. If the requirements from 1 above cannot be met, then one of the following must be provided:

    a. A Prudent Line Study. The study should identify that line which will not be disturbed by erosion, scour, or meandering of a natural (unlined) arroyo, over a period of thirty years and which will not be disturbed by a 100-year storm occurring at any time during the thirty year period. The prudent line shall be so located as to include all freeboard required to

contain the wave action of the 100-year storm.

b. Structural improvements at a ten-foot offset from the 100-year floodplain. Some typical structural improvements could include cutoff walls or extra deep foundations which penetrate below future invert of the arroyo, over a thirty year period and from the 100-year storm. These structural improvements will require an erosion, scour, and stability analysis which demonstrates that the structural improvements can accommodate the expected erosion, and financial guarantee and maintenance covenant agreements, executed with Bernalillo County Public Works, prior to Building Permit Release.

The current ordinance has no retroactive regulations to address past omissions which created drainage problems. Therefore, problems still exist for many parcels that received approval under the now obsolete ordinances of the past.

Since the passage of the municipal and county land subdivision laws by the New Mexico Legislature, the filing of plat maps for subdivided land has become a regulated activity by the State and its political components. The filing of plats for the purpose of subdividing land is now considered to be a "privilege" conferred by the state upon the subdivider after compliance and adherence to land development and consumer protection standards.

3.6 Resolutions

In 1972, AMAFCA adopted Resolution Number Two (1972-2). This resolution established AMAFCA's guidelines concerning flood control as it relates to development. The primary sections of the resolution are paraphrased below:

1E. A "100-year storm" means the 100-year, six hour precipitation from the 1963 Master Plan of Drainage. Rational Method may be used for drainage areas up to five square miles.

3A. Arroyo runoff from upstream, draining through a parcel of land will be able to pass through at a rate of low, velocity, quantity and location as long as it does

not exceed the capacity of storm drainage facilities downstream; or as an alternative, arroyo flow will be able to pass through the parcel at no greater rate, velocity, and quantity or different location than it does under existing conditions.

3B. Runoff discharging from a parcel cannot exceed the capacity of downstream drainage facilities, or as an alternative, the runoff cannot exceed existing discharge, velocity and volume.

6. Applications for plat, replat, development plan, or subdivision approvals filed must have a topographic survey, a drainage report, a grading plan, and an agreement from the land owner that no improvements will be performed until approval is granted.

10. The compliance of Regulation 72-2 may be waived if property was platted and filed prior to July 15, 1972, and if the adherence to a drainage plan report prepared by a registered professional engineer complies with Section 3 above.

In 1978, the updated Drainage Policy Resolution (1975-8) superseded portions of Resolution 72-2. Resolution 75-8 delineated the standards regarding planning, design, financial responsibility, construction, operation, and maintenance of storm drainage facilities within AMAFCA's jurisdiction. The primary improvement from the previous resolution consisted of AMAFCA's responsibility for the maintenance of all facilities constructed using AMAFCA funds.

The Drainage Policy Resolution was again updated in 1980 (1980-15). Although the majority of the new Resolution is identical to the previous Resolution, a few revisions and additions were included. Some of these revisions and additions are summarized:

2E. A "100-year storm" means the 100-year precipitation as shown in NOAA Atlas 2, "Precipitation - Frequency Atlas of the Western United States, Volume IV - New Mexico." Runoff rates may be analyzed using any method which is in accord with generally accepted principles of hydrology.

4A. The arroyo runoff from upstream draining through a parcel of land will be able to pass through at a rate of flow, velocity, quantity and location as does exceed the downstream drainage facility capacity; or as an alternative, arroyo flows will be able to pass through the parcel if the discharge, velocity, and location are

reasonably similar to the existing conditions before alterations.

This section deleted the flow volume requirement from the previous Resolutions and replaced the words "cannot exceed" to "reasonably similar" when addressing the flow rate and velocity.

7. Applications for plat, replat, development plan, or subdivision must contain a contour map, a drainage report including provisions for erosion and drainage right of way, and a grading plan where a major arroyo or its 100-year floodplain will be encroached upon.

Section 7 added the provisions for soil erosion, drainage easements, and the 100-year floodplain to all be incorporated into the grading plan before approval is granted.

Resolution 1981-8 was added to provide minor modifications to Resolution 1980-15 concerning drainage right of way dedication. Resolutions 1982-4 and 1982-6 addressed landowner cost sharing and the adoption of a comprehensive City of Albuquerque drainage ordinance. The City of Albuquerque drainage ordinance is generally consistent with AMAFCA Resolutions.

AMAFCA's 72-2, 75-8, and 80-15 "Drainage Policy Resolutions" are particularly significant because they include and adopt specific requirements for developers to follow when confronted with drainage issues, to protect life and property in the Albuquerque area. The most recent drainage resolution establishes three major policies:

1. It adopts minimum design standards for flood protection to be followed by private and public sectors within the community in the implementation of storm drainage management plan.

2. It adopts a method of allocating responsibilities for the preservation and construction of drainage facilities between and among the cooperating local government subdivisions.

3. It establishes the respective responsibilities of the public and private sectors for the financing and implementation of drainage facility preservation, construction, operation, and maintenance.

A basic requirement of the "Drainage Policy Resolutions" is that surface runoff from all land development, whether originating from or passing through a property, must not adversely affect other properties or be greater than the capacity of arroyos, channels, or other drainage facilities downstream.

The Elena Gallegos Grant area above AMAFCA's North Diversion Channel is addressed under Bernalillo County's "Flood Damage Prevention Ordinance". This area includes all of the old platted areas of North Albuquerque Acres and Sandia Heights South. The design criteria adopted area-wide in May of 1982 by all jurisdictions, allows no increase in runoff, either peak rate or velocity, under design storm conditions which would exceed downstream capacity.

A number of drainage ordinances and supporting resolutions have been passed or modified by the City of Albuquerque, Bernalillo County, the State of New Mexico, and AMAFCA, which guide public and private actions in various portions or all of the area of North Albuquerque Acres and Sandia Heights South. Even though the study area lies outside the current limits of the City of Albuquerque, it does lie within the three-mile extraterritorial zone, thus requiring adherence to City subdivision regulations. Ordinances and area policies which apply to the portion of Sandia Heights South and North Albuquerque Acres covered by this assessment included:

- City Subdivision Ordinance, (Ordinance 97-1973, as amended);
- County Subdivision Ordinance, (Ordinance No. 88-42) adopted by Bernalillo County in 1988;
- Comprehensive City Zoning Code, (Ordinance No. 80-1975, as amended);
- County Zoning Ordinance, (Ordinance No. 213, as amended) adopted by Bernalillo County in 1985;

4.0 CHRONOLOGY & ANALYSIS - PLATTING AND DRAINAGE FOR NORTH ALBUQUERQUE ACRES

North Albuquerque Acres was first platted in 1931. The original platting did not incorporate the environmental constraints of the land, including the contours, the arroyos, and their floodplains. The primary impediments to development of this area include the existing obsolete superimposed grid platting and the total disregard for the natural lay of the land.

Figures 2, 3, 4, 5, 6 and 7 show the portions of North Albuquerque Acres addressed in this report, as shown on Bernalillo County Zone Atlas Maps B-21-Z, C-21-Z, D-21-Z, B-22-Z, C-22-Z, and D-22-Z. The subdivision was divided into three tracts, with two units making up each tract. The parcels were platted in a total of six sheets, one for each unit. Tract 1, Units 1 and 2 were vacated, presumably around 1965, and Sandia Heights South is now located where Tract 1, Units 1 and 2 were first platted. Tracts 2 and 3 of North Albuquerque Acres are presently located in their original 1931 platted sites as shown in the figures. The platting and drainage information for North Albuquerque Acres Tracts 2 and 3, and Sandia Heights South Units 1 through 30, can be found in the Appendix of this report.

The gross one-acre parcels of land in the North Albuquerque Acres area have an ownership pattern that is excessively fragmented, with a minimal amount of established drainage facilities in place. Eventually, storms will flood the majority of North Albuquerque Acres, causing property damage or serious injury. As shown on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) for the subject area, very few parcels are left untouched by the 100-year floodwaters. Much of the area that is not inundated by the floodplain is isolated and land-locked by the flooded areas. Planning requires that such floodways be excluded from normal development and dedicated as floodways, or be mitigated

by construction of appropriate facilities. However, the reality of dedicating large quantities of drainage easements or floodplain mitigation is hindered by the multitude of property owners in the area.

AMAFCA has constructed a training dike on the La Cueva Arroyo, a detention basin and channel system on the South Domingo Baca Arroyo, and a detention basin on the North Domingo Baca Arroyo, and training dikes to prevent the La Cueva from jumping south to the North Domingo Baca Arroyo. All these facilities are maintained by AMAFCA. The redirection of the La Cueva Arroyo, and the detention of the North and South Domingo Baca Arroyos allows portions of land which were in the floodplain to be developed. The floodplain was revised by AMAFCA after the construction of the facilities, thus releasing a majority of the downstream parcels from the FEMA FIRM floodplains.

Dams and detention basins have been constructed to help protect residences, businesses, and roads in North Albuquerque Acres. Even though it has made a significant impact on the downstream flooding, the drainage system now in place is still insufficient to protect upstream structures. A large percentage of the one-acre lots are located within the 100-year floodplain. Until recent regulation by Bernalillo County, people have built within or near these boundaries. The floodplains should not be considered as static boundaries. They will migrate and change after each significant storm.

The primary flooding dilemma associated with North Albuquerque Acres is inherent in the grid platting of the area. The major arroyos that impact the braided alluvial fan on Tracts 2 and 3 of North Albuquerque Acres are chiefly ignored by the current property owners. As pointed out earlier, the checkerboard drainage easements and facilities currently being constructed on an as-needed basis will not constitute a comprehensive drainage solution for the

subdivision. The insufficient number of drainage easements will aggravate the flooding problems of the past due to the numerous parcels involved and the lack of a comprehensive alliance of the land owners to establish viable solutions. To address the responsibilities of drainage facility maintenance, continuous adequately sized drainage easements must first be established and dedicated, then designs for improvements must be completed, and funds must be found to construct proposed projects. None of these elements are generally available in North Albuquerque Acres.

The dedication of drainage easements only recognize the existence of the drainageways. It does not require or infer that any public agency is obligated to perform maintenance, repairs, or any alterations or improvements. No government agency is currently maintaining the natural arroyos in North Albuquerque Acres. AMAFCA is currently maintaining the dams, channels and dikes that it constructed. Bernalillo County maintains the existing roads and associated drainage structures within the road rights-of-way.

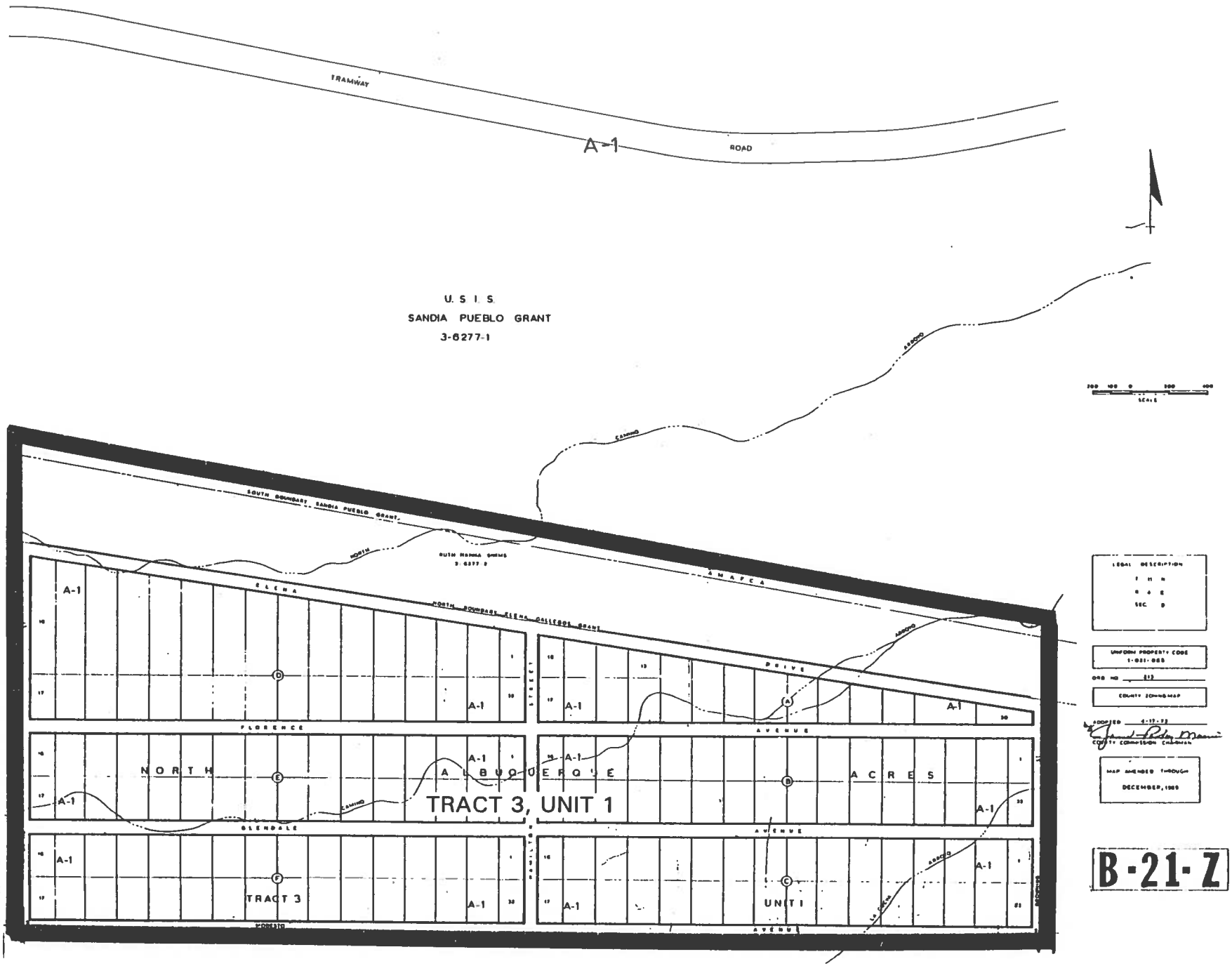


FIGURE 2
ZONE ATLAS MAP B-21-Z
NORTH ALBUQUERQUE ACRES

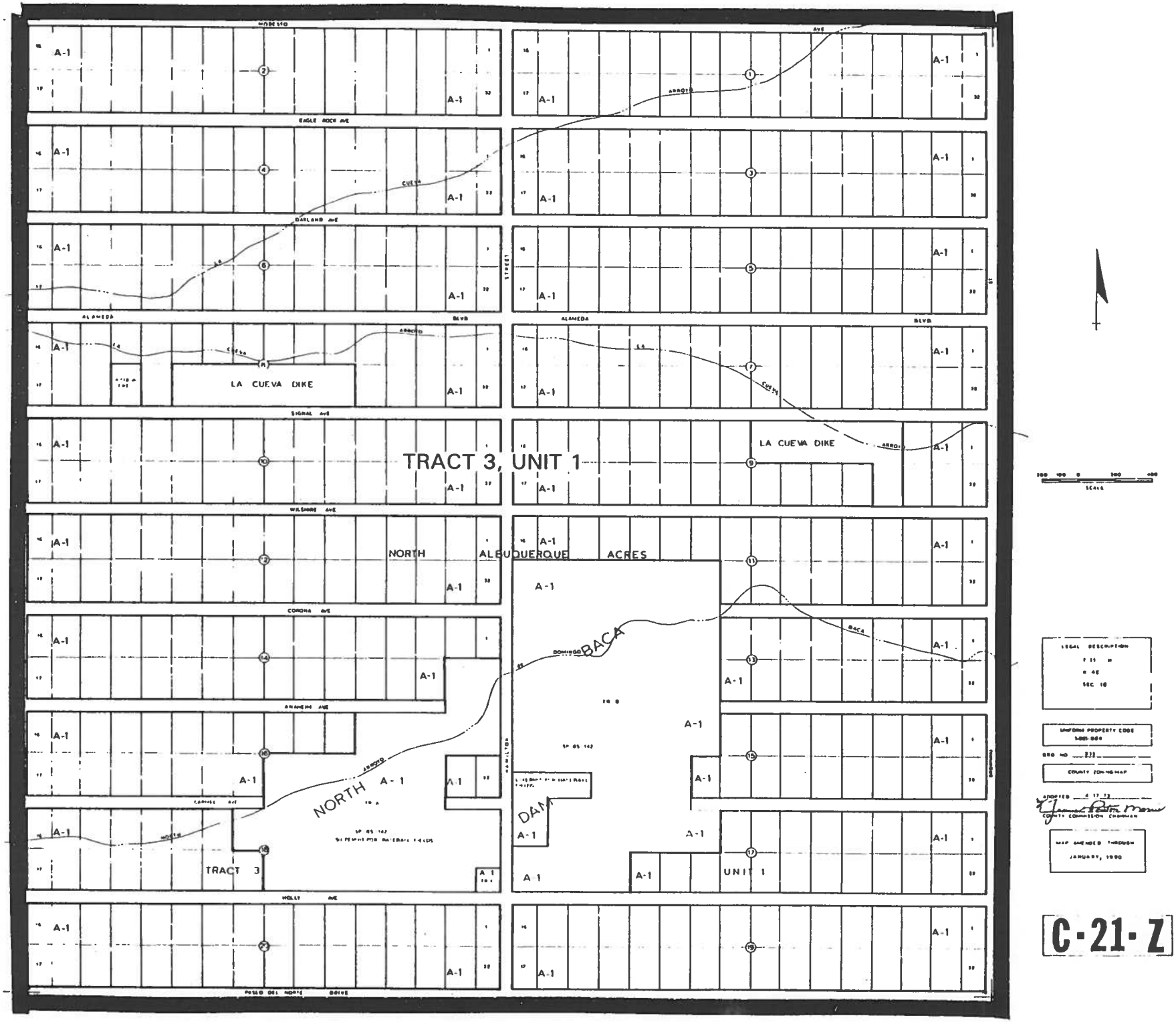


FIGURE 3 - ZONE ATLAS MAP C-21-Z NORTH ALBUQUERQUE ACRES

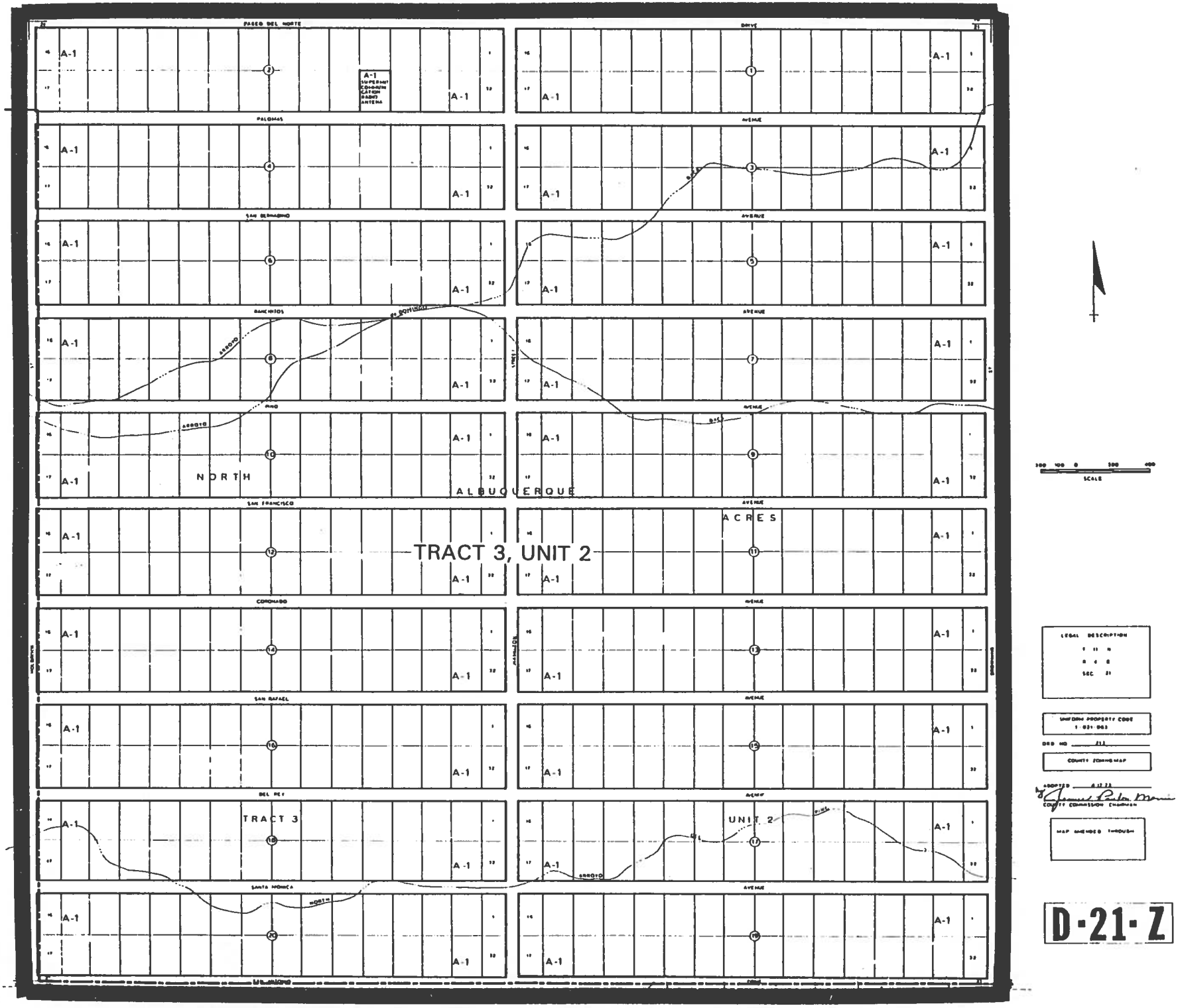


FIGURE 4
ZONE ATLAS MAP D-21-Z
NORTH ALBUQUERQUE ACRES

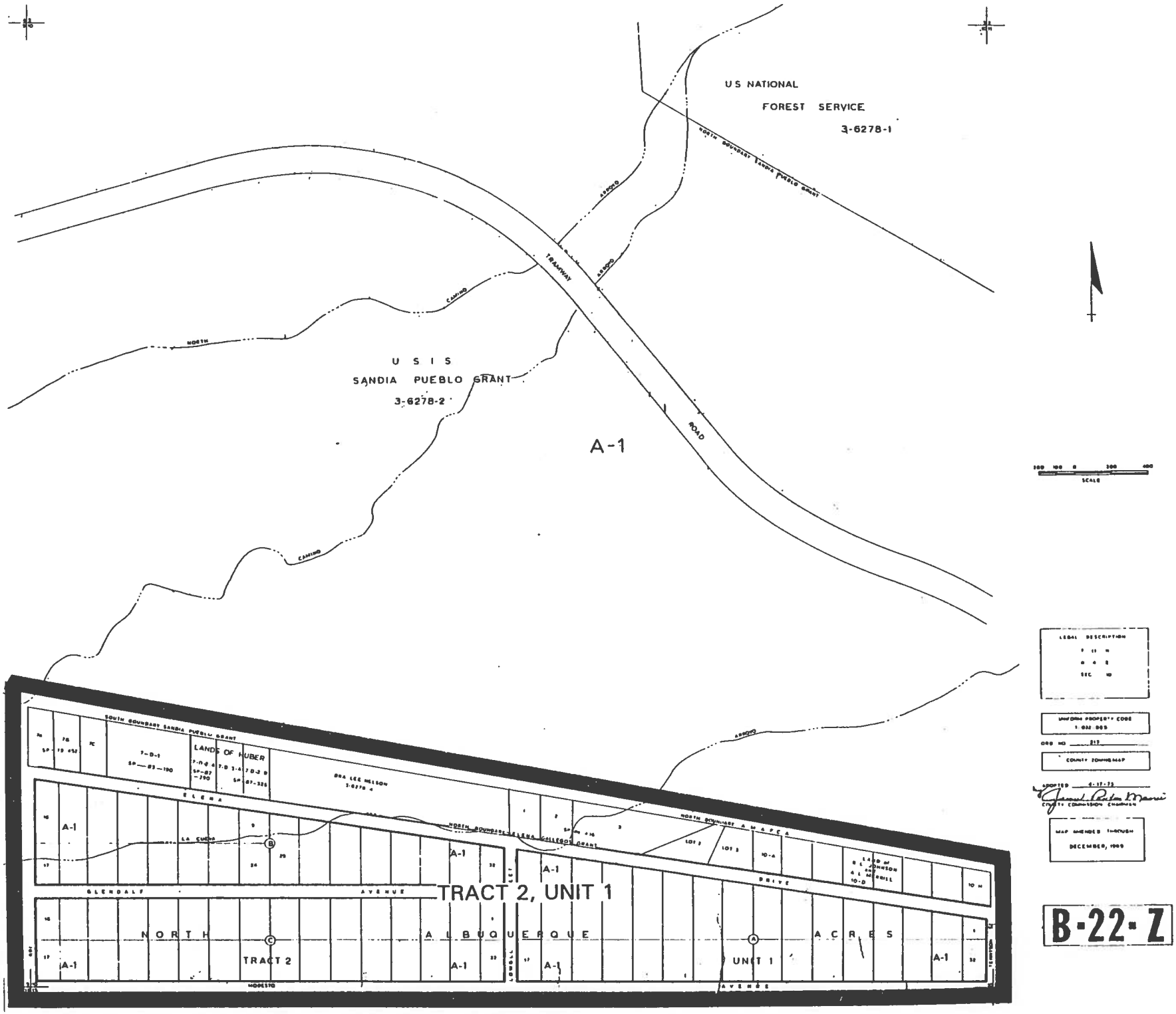
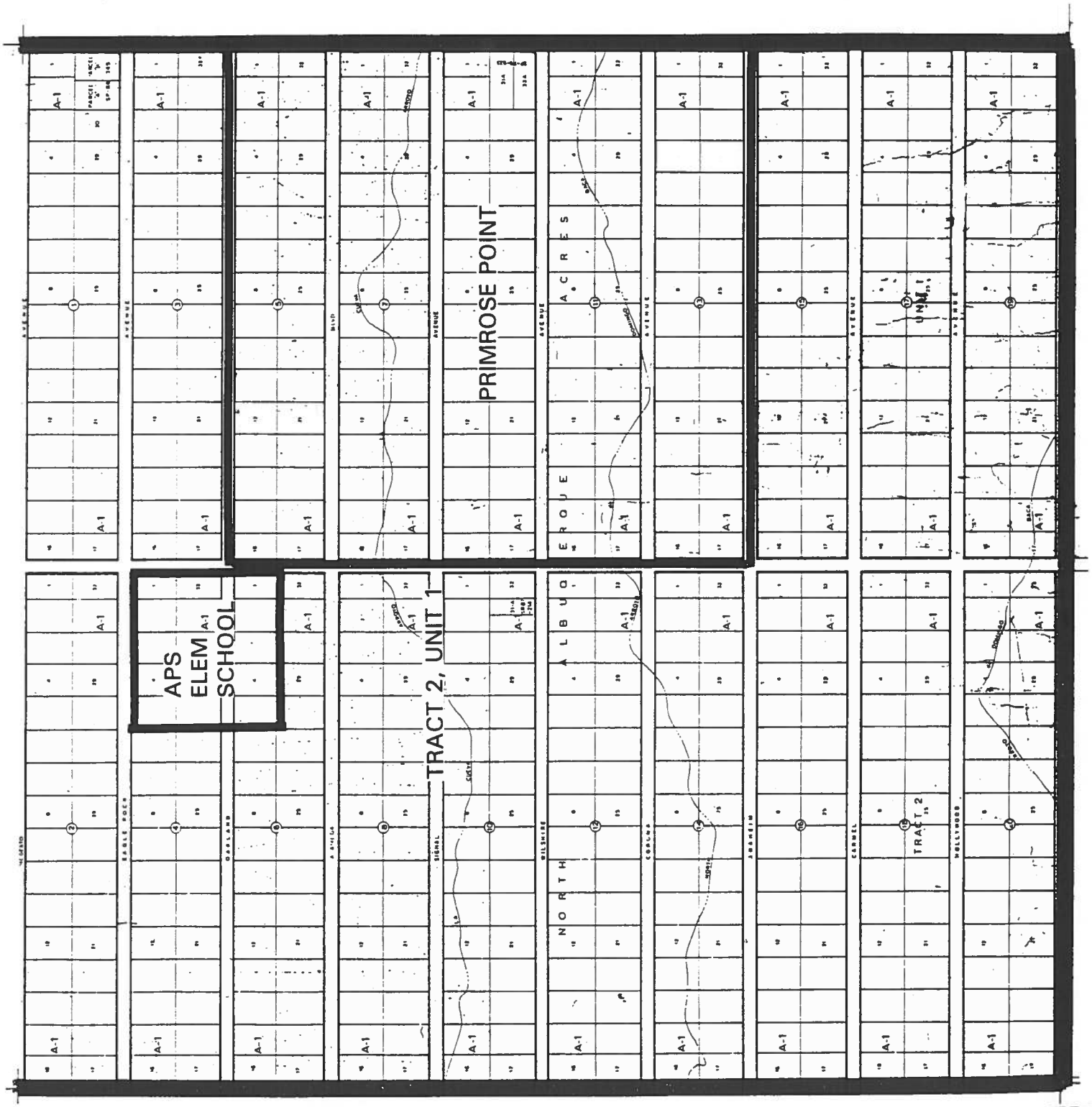


FIGURE 5
ZONE ATLAS MAP B-22-Z
NORTH ALBUQUERQUE ACRES



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ZONE ATLAS M
NORTH ALBUQUER

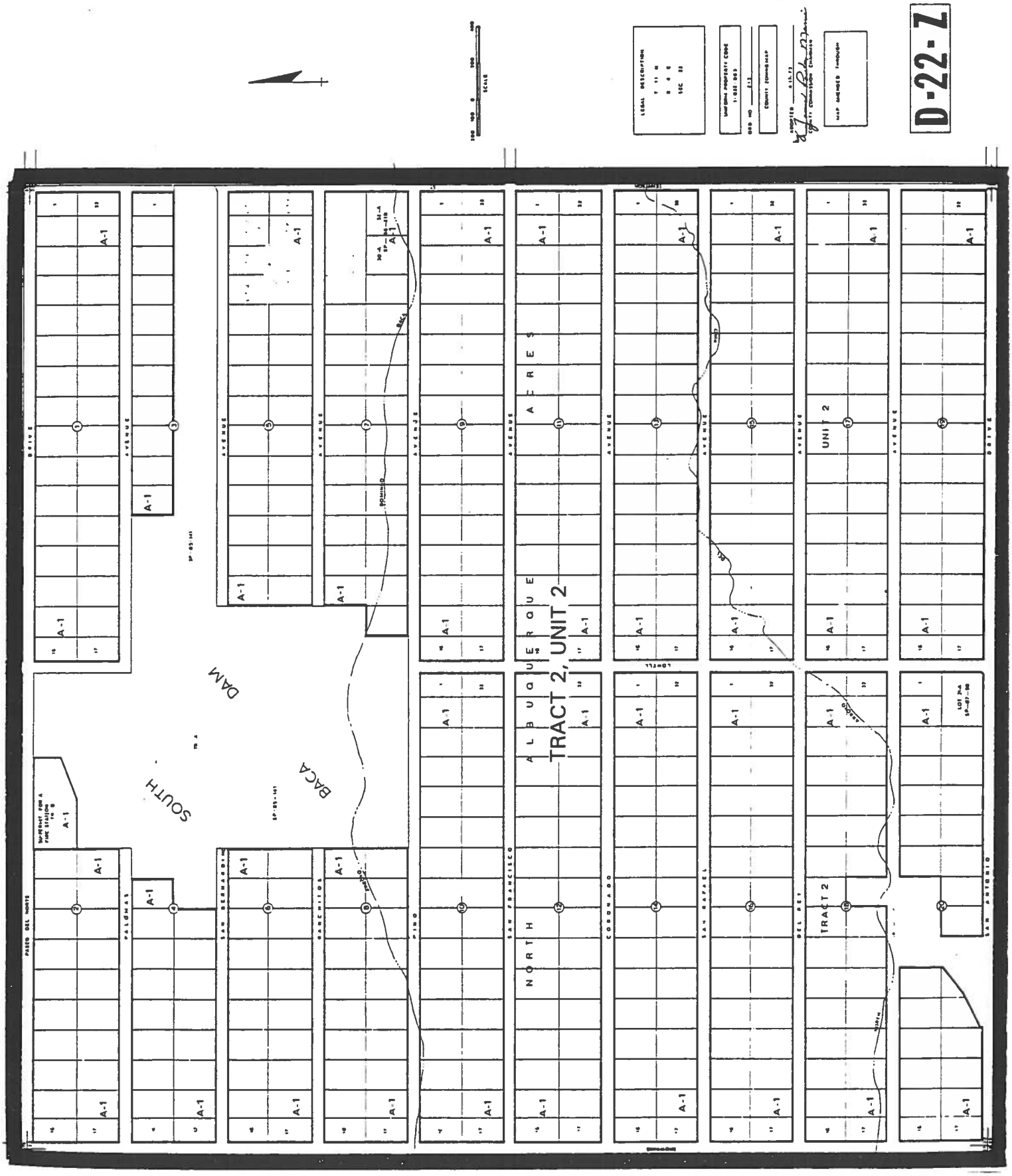

FIGURE 7
ZONE ATLAS MAP D-22-Z
NORTH ALBUQUERQUE ACRES

5.0 CHRONOLOGY OF THE PLATTING AND DRAINAGE FOR SANDIA HEIGHTS SOUTH

Figures 8, 9, and 10 show Sandia Heights South on the Albuquerque Zone Atlas Maps B-23-Z, C-23-Z, and D-23-Z respectively. As stated above, the whole of Sandia Heights South was originally platted as North Albuquerque Acres Tract One, Units 1 and 2 in 1931. The original platting was vacated in 1965. The existing Sandia Heights South subdivision is divided into 27 units, and the detailed platting and drainage information for each of the units can be found in the Appendix of this report.

The development is located in the Sandia Foothills east of Tennyson Drive. The area was generally platted with large rural lots east of Tramway Lane and smaller high-density commercial and multi-family dwelling units adjacent to Tramway Boulevard. The initial unit in the Sandia Heights South subdivision was first platted in June of 1966.

Even though the La Cueva Arroyo, the North Domingo Baca Arroyo, the Domingo Baca Arroyo, and the North Pino Arroyo all pass through Sandia Heights South, a significant deficiency concerning drainage easements is apparent in the platting of Units 1, 2, and 3. The plat maps of Units 4 through 30 each identify specific drainage easements. For Units 4 through 15, these easements are only for major arroyos and drainageways. Easements for cul-de-sacs, road ditch outlets, and cross lot drainage are not generally shown on the plats. The majority of the flooding concerns in the area have come from the properties adjacent to the natural drainage channels.

As stated earlier, the subdivision ordinances in effect at that time were limited and did not consider the management of the major arroyos and their potential for property damage. Drainage easements were not found on the earlier plat maps of Units 1, 2, and 3, even though

there is evidence of arroyos and flooding. The drainage easements shown on the plat maps of Units 4 through 30 show a viable concern for drainage, but it is likely that their capacity is insufficient under current development standards. Individual drainage studies addressing the hydrology or hydraulics impacting Units 1, 2, 3, and 4 were not available. Most drainage reports for Units 5 through 30 were found to be limited and mostly outdated, although they did establish the need for defined drainage easements on the plat maps. Some of the studies addressed only major arroyo flows and ignored the local drainage. Others addressed only the local drainage without addressing the large off-site hydrology or hydraulics. A few of the drainage studies recommended on-site ponding for flood retention. Currently, these ponds have not been constructed or have been covered by sedimentation.

Bernalillo County has taken the position that existing drainage easements are private easements belonging to the respective property owners upon whose land they are located. They have not been dedicated to Bernalillo County, and Bernalillo County has no jurisdiction or right to maintain them, has no responsibility for their maintenance, and has no responsibility for any consequences from the County's failure to maintain them. Although Bernalillo County may have in some instances approved a plat for filing or signed on a proposed drainage scheme, this in no way implies the County accepted or approved the drainage plat or scheme, but rather that the plat or scheme met the minimum requirements the state legislature allowed the County to impose at the time of filing. Unless the drainage facilities and/or easements were dedicated to the County, and the County accepted the dedication, then the facilities and/or easements remain the property and responsibility of the property owner.

Recent developments such as the 1994 Unit 8C, Morgan Subdivision have been developed under the new drainage criteria and have led to infrastructure improvements, including phased channel lining for the North Branch, South Domingo Baca Arroyo adjacent to the subdivision,

channel improvements for two minor tributaries, construction of curb and gutter street sections, drop inlets and a 24" through 48" diameter RCP storm sewer connecting to the culvert under Tramway Boulevard.

Unlike Tracts Two an Three of the North Albuquerque Acres subdivision, Sandia Heights South was designed and platted with more thought for the safety and constructability of the development. The layout and design of the lots and streets take the topography into consideration on the majority of the plat maps.

Due to the large sizes of the lots in most of the units and the relatively small population, obtaining a consensus with the current property owners to mitigate the existing flooding potential would be more viable than in North Albuquerque Acres. Therefore, retrofitting adequate drainage easements and corresponding drainage facilities into the existing units would be more feasible for future flood control.

There is no public agency which maintains the natural arroyos of Sandia Heights South. In many cases, the lack of easements or prohibition of construction disturbance forbids agency maintenance, even if funds were available to maintain these areas. AMAFCA maintains the channels that it constructed. Bernalillo County has agreed to maintain the public roads; this includes the road culverts but not drainage outside of the road rights-of-way. There are several pipe systems and channels which were constructed by private developers that lie outside of the road rights-of-way. In many cases, no agreement exitst for the County or AMAFCA to maintain these facilities.

Bernalillo County Drainage Policy Resolution 684, City of Albuquerque Ordinance No. 58-1976, and AMAFCA Resolution 1975-8 all contain the following language:

"AMAFCA shall have the maintenance responsibility for the North and South Diversion Channels and other facilities constructed using AMAFCA funds.

The City of Albuquerque and/or Bernalillo County within the area of their governmental jurisdiction shall have maintenance and operation responsibilities for drainage and flood control facilities within their geographic boundaries that are not otherwise assigned in this statement."

FIGURE 8
ZONE ATLAS MAP B-23-Z
SANDIA HEIGHTS SOUTH

A combination of bonds and an S.A.D., or bonds and private landowner contribution, are also alternatives.

Establishing a safe and economical solution to the increasing flooding potential of Sandia Heights South and North Albuquerque Acres will be a long-range project. However, without such improvements, periodic flood damage will be expected to occur throughout North Albuquerque Acres and Sandia Heights South.

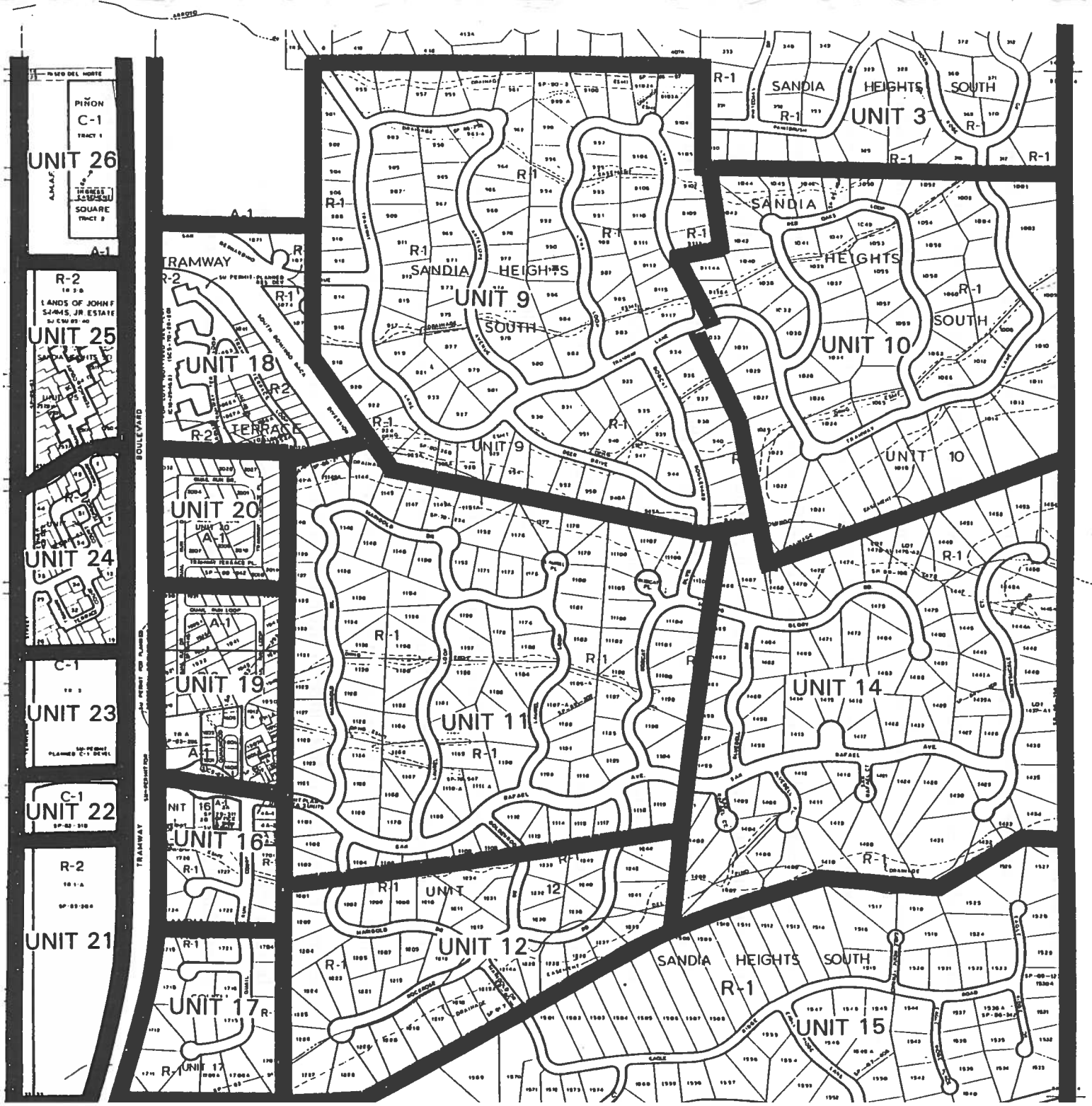

FIGURE 10
ZONE ATLAS MAP D-23-Z
SANDIA HEIGHTS SOUTH

7.0 POSSIBLE SOLUTIONS

Section 11F of the County Storm Drainage Ordinance (90-6) requires individual property owners to file appropriate grading, drainage control, flood control, and erosion control information for a building permit unless the requirements of the ordinance have been previously approved in a drainage report previously approved. This requirement gives a small measure of protection, but does not provide for developing the drainage in the entire area. Except for use of eminent domain acquisition and public finance of major drainage facilities, or the use of special assessment districts, there is currently no mechanism in effect which will allow Bernalillo County, the City of Albuquerque, or AMAFCA to force blanket improvements in North Albuquerque Acres and Sandia Heights South.

The individual property owners may effect some protection for their property through a variety of procedures. The most simple action would be to develop a site-specific means of providing for the major drainage paths including erosion setback limits. This procedure would include the identification of the 100-year storm drainage path, expected erosion for a reasonable design life, and/or construction of permanent structures at some given setback from the drainage path. The arroyo could continue in its historic path and could tolerate some lateral movement. Barriers or walls could be constructed to protect permanent structures, but these may be costly and unsightly. Erosion setback criteria would require periodic maintenance or the construction of additional structural measures. Where roads and drives must cross arroyos and floodplains, structural measures would likely be required. Individual lot solutions would be particularly difficult because of the potential to adversely affect adjacent property and the high cost of incremental solutions.

A combination of bonds and an S.A.D., or bonds and private landowner contribution, are also alternatives.

Establishing a safe and economical solution to the increasing flooding potential of Sandia Heights South and North Albuquerque Acres will be a long-range project. However, without such improvements, periodic flood damage will be expected to occur throughout North Albuquerque Acres and Sandia Heights South.

SANDIA HEIGHTS SOUTH
(Unit not designated, commonly known as UNIT 1)

Zone Atlas Map No:	C-23-Z
First Plat Date Filed:	20 June 1966
Engineer/Surveyor of Record:	Douglas E. Whiteman P.E. & L.S. No.1544
Subsequent Replat Dates:	Lots 72, 73, 85, and 86 11-26-68
Major Drainage Facility:	North Domingo Baca Arroyo
Easements Shown on Plat:	Yes, but not at major arroyos.

Easement Types: Drainage easements between lots 1 and 3 and lots 3 and 5 approximately 20' wide. Also, 20' riding and utility easement shown along southern boundary.

Notes: "The several public thoroughfares hereon shown, including drainage easements, riding easements, electric power and telephone line easements along the front seven feet of each lot and also easements as shown on this plat, including easements for buried service wires and including the right of ingress or egress and the right to trim....."

Drainage easements are dedicated, but there is no specific reference to whom the dedication will go.

Initial Drainage Study Date:	none found
Drainage Study Name:	n/a
Engineering Company of Record:	n/a
Engineer/Surveyor of Record:	n/a
Hydrologic Method and Reference:	n/a
Storm Frequency and Duration:	n/a

Subsequent Drainage Studies: Lot 72 04-15-86

Drainage Easements: n/a

Easement Maintenance: No mention of easement jurisdiction, or maintenance was found.

SANDIA HEIGHTS SOUTH
UNIT 2

Zone Atlas Map No:	C-23-Z
First Plat Date Filed:	20 October 1970 (C7-142)
Engineer/Surveyor of Record:	H. G. Koogle P.E. & L.S. No.1940
Subsequent Replat Dates:	Lot 133 02-06-85 Lots 158, 159 09-21-77 Lots 131, 133 10-04-73 Lots 131, 133 07-09-73 Lots 133, 136, 142, 141, 200, 201, 12-11-70
Major Drainage Facility:	North Domingo Baca Arroyo
Easements Shown on Plat:	No
Easement Types:	n/a

Notes:

"... the several thoroughfares hereon shown, including drainage easements, and also easements as shown on this plat, including easements for buried service wires and including the right of ingress or egress and the right to trim....."

Drainage easements are dedicated, but there is no specific reference to whom the dedication will go.

The plat topography shows dashed lines approximating the banks of the larger arroyos through the platted lots. These dashed lines are not delineated, shown, or noted as easements on the plat.

Initial Drainage Study Date:	none found
Drainage Study Name:	n/a
Engineering Company of Record:	n/a
Engineer/Surveyor of Record:	n/a
Hydrologic Method and Reference:	n/a
Storm Frequency and Duration:	n/a

Subsequent Drainage Studies:

Lot 108	07-29-77	Lot 184	09-18-85	Lot 133	06-16-86
Lot 142	05-04-87	Lot 153	01-27-88	Lot 198	08-15-89
Lot 133A-1-A	05-23-90	Lot 199	1990	Lot 140	1990
Lot 168	1990	Lot 99	09-17-91	Lot 136A	08-20-92
Lot 183	10-19-93				

Drainage Easements: n/a

Easement Maintenance: No mention of easement jurisdiction, or maintenance was noted.

SANDIA HEIGHTS SOUTH
UNIT 3

Zone Atlas Map No:	C-23-Z and D-23-Z
First Plat Date Filed:	03 August 1971
Engineer/Surveyor of Record:	Robert B. Stephenson P.E. & L.S. No.2093
Subsequent Replat Dates:	none found
Major Drainage Facility:	Domingo Baca Arroyo
Easements Shown on Plat:	No
Easement Types:	n/a

Notes:

1. "An easement, seven feet in width, is reserved along the front of each lot adjacent to the street right-of-way for utilities."

2. "All street right-of-way widths are fifty feet except Juniper Hill Road which is forty feet."

Drainage easements are dedicated, but there is no specific reference to whom the dedication will go.

Initial Drainage Study Date:	none found
Drainage Study Name:	n/a
Engineering Company of Record:	n/a
Engineer/Surveyor of Record:	n/a
Hydrologic Method and Reference:	n/a
Storm Frequency and Duration:	n/a

Subsequent Drainage Studies: Lot 357 10-22-91

Drainage Easements: none found

Easement Maintenance: No mention of easement jurisdiction, or maintenance was found.

SANDIA HEIGHTS SOUTH
UNIT 4

Zone Atlas Map No:	C-23-Z
First Plat Date Filed:	02 February 1972
Engineer/Surveyor of Record:	Robert B. Stephenson P.E. & L.S. No.2093
Subsequent Replat Dates:	Lots 406, 407, 408 03-07-72 Lots 411, 412, 413 03-07-72 Lots 426, 427, 453 12-03-74
Major Drainage Facility:	Domingo Baca Arroyo
Easements Shown on Plat:	Yes
Easement Types:	Drainage easements ranging from 50' to 75' wide at major arroyos only.

Notes:

1. "An easement for utilities, seven feet in width is reserved from each lot along each street right of way."

2. "Natural area easements are reserved for the common use of all lot owners having property in the easement. Natural vegetation shall be preserved and augmented for park type activities."

Drainage easements are dedicated, but there is no specific reference to whom the dedication will go.

Initial Drainage Study Date:	none found
Drainage Study Name:	n/a
Engineering Company of Record:	n/a
Engineer/Surveyor of Record:	n/a
Hydrologic Method and Reference:	n/a
Storm Frequency and Duration:	n/a
Subsequent Drainage Studies:	Lot 419 07-07-87 Lot 442 05-31-88 Lot 447 02-01-94
Drainage Easements:	n/a
Easement Maintenance:	No mention of easement jurisdiction, or maintenance was noted.

SANDIA HEIGHTS SOUTH
UNIT 6

Zone Atlas Map No:	C-23-Z
First Plat Date Filed:	03 January 1973 (D5-81)
Engineer/Surveyor of Record:	Robert B. Stephenson P.E. & L.S. No.2093
Subsequent Replat Dates:	Lots 663A, 665A 06-14-88 Lots 659A, 662A 08-03-87 Lots 696A, 698A 07-09-73
Major Drainage Facility:	La Cueva Arroyo
Easements Shown on Plat:	Yes
Easement Types:	A single 50' Drainage and Utility easement at the western boundary. No easements at minor arroyos and watercourses.

Notes: 4. "Additional easements are indicated by dashed lines. Those not otherwise designated are drainage easements, fifteen feet in width, centered on existing drainage channels. The 50 foot drainage and utility easement is centered on lot lines with 100 and 150 foot radius curves at angle points."

Drainage easements are dedicated, but there is no specific reference to whom the dedication will go.

Initial Drainage Study Date:	August 1972
Drainage Study Name:	Sandia Heights Subdivision, Units 6 and 7
Engineering Company of Record:	Bohannan Westman Huston & Associates, Inc.
Engineer/Surveyor of Record:	Raymond R. Gibson, P.E. & L.S. No.3789
Hydrologic Method and Reference:	Rational Method
Storm Frequency and Duration:	100 year frequency / 6-hour duration

Subsequent Drainage Studies: Lot 635 05-31-85 Lot 633 08-29-85

Drainage Easements: "A 650' earth dike as proposed in a drainage report prepared by Robert B. Stephenson, P.E. & L.S. and submitted to the Bernalillo County Planning Commission in March, 1972, is an acceptable solution to protecting the lots in the northwest corner of Unit 6. This report assumes that permission was previously granted by the proper authorities to divert the flow along the dike and into the drainage channel."

"Increased retention from on-site conservation practices, contouring of roads, and selective park areas should help balance the added site runoff. In addition, the absolute retention of 50% of the runoff, required by this report, in back yards and gardens will substantially reduce the on-site runoff."

Note: Retention ponds required by report do not appear to be in place.

SANDIA HEIGHTS SOUTH
UNIT 7 TRACT 2
Chamisa Park Residential Community

Zone Atlas Map No:	C-23-Z
First Plat Date Filed:	08 September 1972 D5-48 (subdivides Unit 7 into tracts)
Engineer/Surveyor of Record:	Robert B. Stephenson P.E. & L.S. No.2093
Subsequent Replat Dates:	
Major Drainage Facility:	La Cueva Arroyo
Easements Shown on Plat:	No
Easement Types:	
Notes:	
Initial Drainage Study Date:	February 1975
Drainage Study Name:	Tracts 1 and 2 Unit 7 Sandia Heights South
Subsequent Drainage Studies:	
Engineering Company of Record:	Bohannon Westman Huston & Assoc. Inc.
Engineer/Surveyor of Record:	Michael M. Emery P.E. No. 5194
Hydrologic Method and Reference:	Flood Plain Information, Albuquerque Arroyos Part 1
Storm Frequency and Duration:	100 year

Easement Maintenance: "Permission to construct and maintain improvements on the Sandia Pueblo such as proposed in the above report (August 1972 report) has been granted to Sandia Peak Tram Company by the Sandia Pueblo. Details of this agreement are contained in the master lease agreement between the Sandia Peak Tram Company and the Sandia Pueblo."

Note: Flood plain was identified in the report and pad sites were located outside the flood plain.

SANDIA HEIGHTS SOUTH
UNIT 7 TRACT 3 & 4

Zone Atlas Map No:	C-23-Z
First Plat Date Filed:	08 September 1972 D5-48 (subdivides Unit 7 into tracts)
Engineer/Surveyor of Record:	Robert B. Stephenson P.E. & L.S. No.2093
Subsequent Replat Dates:	08 June 1973 D5-153
Major Drainage Facility:	La Cueva Arroyo and North Domingo Baca
Easements Shown on Plat:	No
Easement Types:	

Notes:

Initial Drainage Study Date:
Drainage Study Name:
Subsequent Drainage Studies:
Engineering Company of Record:
Engineer/Surveyor of Record:
Hydrologic Method and Reference:
Storm Frequency and Duration:

Easement Maintenance:

SANDIA HEIGHTS SOUTH
TRACT 7 UNIT 7

Zone Atlas Map No: C-23-Z
First Plat Date Filed: 08 September 1972 D5-48
Engineer/Surveyor of Record: Robert B. Stephenson P.E. & L.S. No.2093
Subsequent Replat Dates:

01-12-73	03-05-73	06-08-73	(D5-153 tracts 3 & 4)	
08-27-73	(A4-173 Tracks B1 & 2)		03-06-75	10-07-75
12-31-75	04-02-76	07-20-76	08-26-76	07-29-77
06-08-77	(D9-156, Lot 3 SHS Unit 7)		01-26-78	05-08-78
10-12-78	11-16-78	03-01-79	06-01-79	06-04-79
07-27-79	(El Mirador)	07-01-80	08-01-80	11-25-80
11-16-82	07-29-83	08-07-84	06-05-85	
08-22-88	(C37-42, B1 & 2 of Tract 7, Cedar Canyon)			

Major Drainage Facility: North Domingo Baca Arroyo
Easements Shown on Plat: Yes
Easement Types: Two 50' wide and one 60' wide bisecting from east to west. No easements at minor arroyos or watercourses.

Notes: Drainage easements are dedicated, but there is no specific reference to whom the dedication will go.

Initial Drainage Study Date: August 1972
Drainage Study Name: Sandia Heights Subdivision, Units 6 and 7
Engineering Company of Record: Bohannan Westman Huston & Associates, Inc.
Engineer/Surveyor of Record: Raymond R. Gibson, P.E. & L.S. No.3789
Hydrologic Method and Reference: Rational Method
Storm Frequency and Duration: 100 year frequency / 6-hour duration

Other Drainage Studies: February 1975, Tracks 1 & 2 , Unit 7, Sandia Heights South.
05 June 1985 Lot 23-46 Parcel C, Sandia Haciendas

Drainage Easements "The drainage paths of the major arroyos are to be directed into easements provided by the amended plat. The lots affected are as follows: 2-11, 13, 28, 29, and 30 on the south and lots 5, 6, 15, 17, and 20 on the north."

"The construction of four ponds with adequate capacity to control the developed runoff are required. A total retention capacity of 0.87 ac-ft is required by the original drainage report concept."

Note: Retention ponds do not appear to be in place.

Easement Maintenance: No mention of easement jurisdiction, or maintenance was noted in the report.

SANDIA HEIGHTS SOUTH
UNIT 7 TRACT 7
Cedar Canyon Subdivision

Zone Atlas Map No:	C-23-Z
First Plat Date Filed:	08 September 1972 D5-48 (subdivides Unit 7 into tracts)
Engineer/Surveyor of Record:	Robert B. Stephenson P.E. & L.S. No.2093
Subsequent Replat Dates:	27 August 1973 A4-173 (portion of tract 7 of Unit 7 22 August 1988 C37-42
Major Drainage Facility:	North Domingo Baca Arroyo
Easements Shown on Plat:	Yes
Easement Types:	Public Utility, Public Drainage and Private Drainage
Notes:	Public Drainage easements are dedicated to AMAFCA
Initial Drainage Study Date:	August 1972
Drainage Study Name:	Sandia Heights Subdivision, Units 6 & 7
Subsequent Drainage Studies:	
Engineering Company of Record:	Bohannon Westman Huston & Assoc. Inc.
Engineer/Surveyor of Record:	Raymond R. Gibson, P.E. No.3789
Hydrologic Method and Reference:	Rational formula, Sandia Foothills Drainage Study 1971 and City of Albuquerque Master Plan of Drainage 1963
Storm Frequency and Duration:	100 year frequency
Drainage Easements:	North Domingo Baca Arroyo
Easement Maintenance:	AMAFCA

Note: "The control of the runoff shall comply with the requirements of the Albuquerque Metropolitan Arroyo Flood Control Authority and with present City of Albuquerque Policies."

SANDIA HEIGHTS SOUTH
UNIT 7 TRACT 7
El Mirador Subdivision

Zone Atlas Map No:	C-23-Z
First Plat Date Filed:	08 Sepember 1972 D5-48 (subdivides Unit 7 into tracts)
Engineer/Surveyor of Record:	Robert B. Stephenson P.E. & L.S. No.2093
Subsequent Replat Dates:	27 Julu 1979 D9-156
Major Drainage Facility:	
Easements Shown on Plat:	
Easement Types:	Public Roadway

Notes:

Initial Drainage Study Date:
Subsequent Drainage Studies:
Drainage Study Name:
Engineering Company of Record:
Engineer/Surveyor of Record:
Hydrologic Method and Reference:
Storm Frequency and Duration:

Other Drainage Studies: August 1972, Tracks 6 & 7, Unit 7, Sandia Heights South.

Drainage Easements:

Easement Maintenance:

SANDIA HEIGHTS SOUTH
UNIT 7 TRACT 7
Sandia Haciendas Subdivision

Zone Atlas Map No:	C-23-Z
First Plat Date Filed:	08 Sepember 1972 D5-48 (subdivides Unit 7 into tracts)
Engineer/Surveyor of Record:	Robert B. Stephenson P.E. & L.S. No.2093
Subsequent Replat Dates:	26 August 1976 C11-95 11 November 1978 C14-48 11 April 1994 Unit 2 Sandia Haciendas
Major Drainage Facility:	North Domingo Baca Arroyo
Easements Shown on Plat:	Yes
Easement Types:	Public Utility and Drainage
Notes:	Drainage easements are dedicated to AMAFCA
Initial Drainage Study Date:	August 1972
Subsequent Drainage Studies:	May 1993
Drainage Study Name:	Sandia Haciendas Subdivision Unit 2
Engineering Company of Record:	Vigil Engineering
Engineer/Surveyor of Record:	Jacob A. Vigil, P.E. No.4570
Hydrologic Method and Reference:	City of Albuquerque DPM Section 22.2 Hydrology
Storm Frequency and Duration:	100 year frequency / 6-hour duration
Other Drainage Studies:	August 1972, Tracks 6 & 7, Unit 7, Sandia Heights South. June 1985 Lot 23-46 Parcel C, Sandia Haciendas
Drainage Easements:	North Domingo Baca Arroyo
Easement Maintenance:	AMAFCA

SANDIA HEIGHTS SOUTH
UNIT 7 TRACT 7
Juniper Village

Zone Atlas Map No:	C-23-Z
First Plat Date Filed:	08 Sepember 1972 D5-48 (subdivides Unit 7 into tracts)
Engineer/Surveyor of Record:	Robert B. Stephenson P.E. & L.S. No.2093
Subsequent Replat Dates:	06 March 1975 D6-129
Major Drainage Facility:	
Easements Shown on Plat:	
Easement Types:	Public Roadway

Notes:

Initial Drainage Study Date:
Subsequent Drainage Studies:
Drainage Study Name:
Engineering Company of Record:
Engineer/Surveyor of Record:
Hydrologic Method and Reference:
Storm Frequency and Duration:

Other Drainage Studies: August 1972, Tracks 6 & 7, Unit 7, Sandia Heights South.

Drainage Easements:

Easement Maintenance:

SANDIA HEIGHTS SOUTH
UNIT 7 TRACT 7
Replat of Parcel E

Zone Atlas Map No:	C-23-Z
First Plat Date Filed:	08 Sepember 1972 D5-48 (subdivides Unit 7 into tracts)
Engineer/Surveyor of Record:	Robert B. Stephenson P.E. & L.S. No.2093
Subsequent Replat Dates:	26 January 1978 D8-74
Major Drainage Facility:	
Easements Shown on Plat:	Yes
Easement Types:	Public Roadway

Notes:

Initial Drainage Study Date:
Subsequent Drainage Studies:
Drainage Study Name:
Engineering Company of Record:
Engineer/Surveyor of Record:
Hydrologic Method and Reference:
Storm Frequency and Duration:

Other Drainage Studies: August 1972, Tracks 6 & 7, Unit 7, Sandia Heights South.

Drainage Easements:

Easement Maintenance:

SANDIA HEIGHTS SOUTH
UNIT 7 TRACT 7
Lot 3

Zone Atlas Map No:	C-23-Z
First Plat Date Filed:	08 Sepember 1972 D5-48 (subdivides Unit 7 into tracts)
Engineer/Surveyor of Record:	Robert B. Stephenson P.E. & L.S. No.2093
Subsequent Replat Dates:	08 June 1977 A5-60
Major Drainage Facility:	
Easements Shown on Plat:	
Easement Types:	Public Roadway

Notes:

Initial Drainage Study Date:
Subsequent Drainage Studies:
Drainage Study Name:
Engineering Company of Record:
Engineer/Surveyor of Record:
Hydrologic Method and Reference:
Storm Frequency and Duration:

Other Drainage Studies: August 1972, Tracks 6 & 7, Unit 7, Sandia Heights South.

Drainage Easements:

Easement Maintenance:

SANDIA HEIGHTS SOUTH
UNIT 7 TRACT 8
Tramway Vista Subdivision

Zone Atlas Map No:	C-23-Z
First Plat Date Filed:	08 September 1972 D5-48 (subdivides Unit 7 into tracts)
Engineer/Surveyor of Record:	Robert B. Stephenson P.E. & L.S. No.2093
Subsequent Replat Dates:	04 June 1979 D9-136 Unit 1
	04 June 1979 D9-137 Unit 2
	01 July 1980 C17-5 Unit 3
Major Drainage Facility:	La Cueva Arroyo
Easements Shown on Plat:	
Easement Types:	

Notes:

Initial Drainage Study Date:
Drainage Study Name:
Subsequent Drainage Studies:
Engineering Company of Record:
Engineer/Surveyor of Record:
Hydrologic Method and Reference:
Storm Frequency and Duration:

Drainage Easements:

Easement Maintenance:

Note:

SANDIA HEIGHTS SOUTH
UNIT 7 TRACT 7
Cedar Canyon Subdivision

SANDIA HEIGHTS SOUTH
UNIT 8

Zone Atlas Map No:	C-23-Z
First Plat Date Filed:	03 December 1974
Engineer/Surveyor of Record:	Robert B. Stephenson P.E. & L.S. No.2093
Subsequent Replat Dates:	09-26-75 08-25-76 09-07-76 03-28-77 01-10-80 07-28-77 08-29-77 08-30-77 12-09-77 06-08-78 03-27-78 06-01-78 06-28-78 07-06-78 09-28-78 10-27-78 02-06-79 04-18-79 04-27-79 05-24-79 07-16-79 08-31-79 09-01-83 09-19-79 06-26-85
Major Drainage Facility:	North Domingo Baca Arroyo
Easements Shown on Plat:	Yes
Easement Types:	Four drainage easements of different widths and irregular shapes bisecting the plat from east to west. No easements on minor arroyos or watercourses.
Notes:	1. "An easement for utilities, seven feet in width, is reserved from each lot along each street right-of-way. Additional easements are indicated by dashed lines. Those not otherwise designated are drainage easements in which construction is prohibited." 4. "Natural drainage channels shall not be changed by any construction." 5. "Land within this plat shall be developed in accordance with drainage plan prepared by Bohannan Westman Huston and Associates, consulting engineers."

Drainage easements are dedicated, but there is no specific reference to whom the dedication will go.

Initial Drainage Study Date:	October 1974
Drainage Study Name:	Drainage Report for Unit 8, Sandia Heights South, Tracts 1 & 2.
Engineering Company of Record:	Bohannan Westman Huston and Associates, Inc
Engineer/Surveyor of Record:	Michael M. Emery, P.E. No. 5194
Hydrologic Method and Reference:	Rational formula/ Phase A report, Northeast Heights Drainage Management Plan, Leonard Rice Consulting Water Engineers Inc.
Storm Frequency and Duration:	100 year/ 6 hours duration

Other Drainage Studies:	Lot D-2	03-14-78	Lot A, Tr 1	12-20-84
	Lot 8-A	02-17-86	Lots 4B1, 4B2	12-16-86

SANDIA HEIGHTS SOUTH
UNIT 8 C
Morgan Subdivision

Zone Atlas Map No:	C-23-Z
First Plat Date Filed:	21 January 1994 94C-118
Engineer/Surveyor of Record:	Jeff Mortensen & Associates
Subsequent Replat Dates:	February 1994 94C-39
Major Drainage Facility:	North Branch, South Domingo Baca Arroyo
Easements Shown on Plat:	yes
Easement Types:	Utility, drainage and flood plain
Notes:	Streets are dedicate to Bernalillo County
Initial Drainage Study Date:	May 1992 as revised
Subsequent Drainage Studies:	
Drainage Study Name:	Grading and Drainage Plan, Don Morgan Subdivision
Engineering Company of Record:	D. Mark Goodwin and Associates
Engineer/Surveyor of Record:	Zane M. Goodwin P.E. & P.S. No.2745
Hydrologic Method and Reference:	AHYMO (April 1990 version) and HEC-2
Storm Frequency and Duration:	100 year/6 hour
Other Drainage Studies:	
Drainage Easements:	A 24" through 48" diameter RCP storm sewer runs in the street right-of-way and in a drainage easement to a connection with the North Branch, South Domingo Baca culvert under Tramway Boulevard.
Easement Maintenance:	

SANDIA HEIGHTS SOUTH
UNIT 9

Zone Atlas Map No:	D-23-Z
First Plat Date Filed:	25 September 1973
Engineer/Surveyor of Record:	Robert B. Stephenson P.E. & L.S. No.2093
Subsequent Replat Dates:	Lots 9102A and 9103A 03-11-86
Major Drainage Facility:	North Domingo Baca Arroyo and Domingo Baca Arroyo
Easements Shown on Plat:	Yes
Easement Types:	Numerous drainage easements traverse the plat following the major natural channels from east to west. No minor drainage easements shown.
Notes:	1. "An easement for utilities, seven feet in width, is reserved from each lot along each street right-of-way. Additional easements are indicated by dashed lines. Those not otherwise designated are drainage easements in which construction is prohibited." 4. "Natural drainage channels shall not be changed by any construction." 5. "Land within this plat shall be developed in accordance with drainage plan prepared by Bohannan Westman Huston and Associates, consulting engineers." Drainage easements are dedicated, but there is no specific reference to whom the dedication will go.
Initial Drainage Study Date:	April 1973
Drainage Study Name:	Drainage Report For Unit 9, Sandia Heights Subdivision
Engineering Company of Record:	Bohannan Westman Huston and Associates, Inc
Engineer/Surveyor of Record:	Raymond R. Gibson P.E. & L.S. No.3789
Hydrologic Method & Reference:	COE Study, Albuquerque Arroyo Part IV
Storm Frequency and Duration:	100-year and SPF frequency / 6-hour duration
Other Drainage Studies:	Lot 9103 11-27-85 Lot 963 07-02-86 Lot 964 1991
Easement Maintenance:	No mention of easement jurisdiction, or maintenance was noted in the report.
Notes:	"Due to the size of the lots and the natural condition in which the land will be left it is felt no adverse increase in runoff will be created by the development in this area. It is also felt that if the non-obstruction of the floodways is required of individual lot developers and if the floodways are shown on the plat, there will be no damage done by water coming onto and through the property."

SANDIA HEIGHTS SOUTH
UNIT 10

Zone Atlas Map No:	D-23-Z
First Plat Date Filed:	11 March 1974 (D6-26) include replat of lots 9114 & 9116 in Unit 9
Engineer/Surveyor of Record:	Robert B. Stephenson P.E. & L.S. No.2093
Subsequent Replat Dates:	Lots 1048A 11-25-85
Major Drainage Facility:	Domingo Baca Arroyo
Easements Shown on Plat:	Yes
Easement Types:	Numerous drainage easements traverse the plat following the natural channels from east to west.

Notes:

1. An easement for utilities, seven feet in width, is reserved from each lot along each street right-of-way. Additional easements are indicated by dashed lines. Those not otherwise designated are drainage easements in which construction is prohibited.
4. Natural drainage channels shall not be changed by any construction.
5. Land within this plat shall be developed in accordance with drainage plan prepared by Bohannan Westman Huston and Associates, consulting engineers.

Drainage easements are dedicated, but there is no specific reference to whom the dedication will go.

Initial Drainage Study Date:	June 1973
Drainage Study Name:	Drainage Report For Unit 10, Sandia Heights Subdivision
Engineering Company of Record:	Bohannan Westman Huston and Associates, Inc
Engineer/Surveyor of Record:	Raymond R. Gibson P.E. & L.S. No.3789
Hydrologic Method & Reference:	COE Study, Albuquerque Arroyo Part IV, ditch curves
Storm Frequency and Duration:	100-year and SPF frequency / 6-hour duration
Other Drainage Studies:	Lot 9103 11-27-85 Lot 963 07-02-86
Easement Maintenance:	No easement jurisdiction, or maintenance was noted in the report.

Conclusions:

"Leaving the flood ways completely open and in their natural state and extending their boundaries out far enough to carry flows produced from the Standard Project Flood falling in the Domingo Baca Canyon drainage area insures that the area will not be flooded by any rain that can be realistically expected. The buffering effect of large lots, landscaping and natural flood ways will ensure that the flow rate and velocity of storm runoff will not be increased by development of the area."

SANDIA HEIGHTS SOUTH
UNIT 11

Zone Atlas Map No:	D-23-Z
First Plat Date Filed:	12 February 1975 (D6-123)
Engineer/Surveyor of Record:	Robert B. Stephenson P.E. & L.S. No.2093
Subsequent Replat Dates:	Lots 1185A & 1187A 08-04-89 Lot 1141A 02-04-85 Lots 1110A & 1111A 09-29-78 Lot 1143A 01-30-85 Lots 1149A & 1151A 04-21-78
Major Drainage Facility:	Pino Arroyo
Easements Shown on Plat:	Yes
Easement Types:	Numerous drainage easements traverse the plat following the natural channels from east to west.

Notes:

1. An easement for utilities, seven feet in width, is reserved from each lot along each street right-of-way. Additional easements are indicated by dashed lines. Those not otherwise designated are drainage easements in which construction is prohibited.
4. Natural drainage channels shall not be changed by any construction.
5. Land within this plat shall be developed in accordance with drainage plan prepared by Bohannan Westman Huston and Associates, consulting engineers and approved by AMAFCA on Nov 30, 1973.

Drainage easements are dedicated, but there is no specific reference to whom the dedication will go.

Initial Drainage Study Date:	July 1973
Drainage Study Name:	Drainage Report For Units 11 & 12, Sandia Heights Subd
Engineering Company of Record:	Bohannan Westman Huston and Associates, Inc
Engineer/Surveyor of Record:	Michael M. Emery P.E. & L.S. No.5194
Hydrologic Method & Reference:	COE Study, Albuquerque Arroyo Part IV, ditch curves
Storm Frequency and Duration:	100-year and SPF frequency / 6-hour duration
Other Drainage Studies:	Lowe Drainage Easement Vacations 10-11-85
Easement Maintenance:	No easement jurisdiction, or maintenance was noted in the report.

Conclusions: "Leaving the flood ways completely open and in their natural state and extending their boundaries out far enough to carry flows produced from the SPF falling in the Domingo Baca and Pino Canyon drainage area insures that the area will not be flooded by any rain that can be realistically expected. The buffering effect of large lots, landscaping and natural flood ways will ensure that the flow rate and velocity of storm runoff will not be increased by development of the area."

SANDIA HEIGHTS SOUTH
UNIT 12

Zone Atlas Map No:	D-23-Z
First Plat Date Filed:	12 February 1975 (D6-121)
Engineer/Surveyor of Record:	Robert B. Stephenson P.E. & L.S. No.2093
Subsequent Replat Dates:	Lots 1214A & 1215A 01-13-81
Major Drainage Facility:	Pino Arroyo
Easements Shown on Plat:	Yes
Easement Types:	Large drainage easement traversing the southern edge of the plat from east to west.

Notes:

1. An easement for utilities, seven feet in width, is reserved from each lot along each street right-of-way. Additional easements are indicated by dashed lines. Those not otherwise designated are drainage easements in which construction is prohibited.
4. Natural drainage channels shall not be changed by any construction.
5. Land within this plat shall be developed in accordance with drainage plan prepared by Bohannan Westman Huston and Associates, consulting engineers and approved by AMAFCA on Nov 30, 1973.

Drainage easements are dedicated, but there is no specific reference to whom the dedication will go.

Initial Drainage Study Date:	July 1973
Drainage Study Name:	Drainage Report For Units 11 & 12, Sandia Heights Subd (Unit 12 included area that became Unit 14
Engineering Company of Record:	Bohannan Westman Huston and Associates, Inc
Engineer/Surveyor of Record:	Michael M. Emery P.E. & L.S. No.5194
Hydrologic Method & Reference:	COE Study, Albuquerque Arroyo Part IV, ditch curves
Storm Frequency and Duration:	100-year and SPF frequency / 6-hour duration

Other Drainage Studies:

Lot 1217 05-05-87	Lot 1236 04-02-88
Lot 1228 09-01-88	Lot 1214A 1990
Lot 1241 12-09-86	Lot 1220 1990
Lot 1215A 03-28-89	

Easement Maintenance: No easement jurisdiction, or maintenance was noted in the report.

Conclusions: "Leaving the flood ways completely open and in their natural state and extending their boundaries out far enough to carry flows produced from the SPF falling in the Domingo Baca and Pino Canyon drainage area insures that the area will not be flooded by any rain that can be realistically expected. The buffering effect of large lots, landscaping and natural flood ways will ensure that the flow rate and velocity of storm runoff will not be increased by development of the area."

SANDIA HEIGHTS SOUTH
UNIT 14
(Formerly a portion of Unit 12 for studies.)

Zone Atlas Map No:	D-23-Z
First Plat Date Filed:	12 February 1975 (D6-124)
Engineer/Surveyor of Record:	Robert B. Stephenson P.E. & L.S. No.2093
Subsequent Replat Dates:	Lots 1476A1, 1476A2 06-23-88
Lot 1476A 03-04-88	Lots 1437A, 1438A 02-02-88
Lots 1441A, 1439A 10-03-84	Lots 1444A, 1446A, 1448A 12-08-83

Major Drainage Facility:	Domingo Baca Arroyo and Pino Arroyo
Easements Shown on Plat:	Yes
Easement Types:	Large drainage easements traversing the northern and southern boundaries of the plat from east to west.

Notes:

1. An easement for utilities, seven feet in width, is reserved from each lot along each street right-of-way. Additional easements are indicated by dashed lines. Those not otherwise designated are drainage easements in which construction is prohibited.
4. Natural drainage channels shall not be changed by any construction.
5. Land within this plat shall be developed in accordance with drainage plan prepared by Bohannan Westman Huston and Associates, consulting engineers and approved by AMAFCA on Nov 30, 1973.

Drainage easements are dedicated, but there is no specific reference to whom the dedication will go.

Initial Drainage Study Date:	July 1973
Drainage Study Name:	Drainage Report For Unit 11 & 12, Sandia Heights Subd
Engineering Company of Record:	Bohannan Westman Huston and Associates, Inc
Engineer/Surveyor of Record:	Michael M. Emery P.E. & L.S. No.5194
Hydrologic Method & Reference:	COE Study, Albuquerque Arroyo Part IV, ditch curves
Storm Frequency and Duration:	100-year and SPF frequency / 6-hour duration

Other Drainage Studies:	Lot 1450 07-10-86	Lot 1452 04-13-87
Lot 1463 1990	Lot 1450 07-10-86	Lot 1477 01-22-92
Lot 1446A 01-23-92	Lot 1434 02-22-92	Lot 1433 11-06-92
Lot 1448 11-19-92	Lot 1447 09-24-93	Lot 1403 11-24-93

Easement Maintenance: No mention of easement jurisdiction, or maintenance was noted in the report.

Conclusions: "Leaving the flood ways completely open and in their natural state and extending their boundaries out far enough to carry flows produced from the SPF falling in the Domingo Baca and Pino Canyon drainage area insures that the area will not be flooded by any rain that can be realistically expected.

SANDIA HEIGHTS SOUTH
UNIT 15

Zone Atlas Map No:	D-23-Z and E-23-Z
First Plat Date Filed:	05 June 1984
Engineer/Surveyor of Record:	A. Dwain Weaver P.L.S. No.6544
Subsequent Replat Dates:	Lot 1536A 09-19-86 Lot 1530A 05-03-89 Lot 1549A 02-03-88
Major Drainage Facility:	Domingo Baca Arroyo and Pino Arroyo
Easements Shown on Plat:	Yes
Easement Types:	Large drainage easements traversing the northern and southern boundaries of the plat from east to west.

Notes: 100-year flood plains dedicated on this plat are from the preliminary FIA maps prepared by Bohannon-Huston, Inc. They are dedicated to the AMAFCA, its successors and assigns, with full and free consent and in accordance with the desire of the undersigned owners. This dedication is for drainage, flood control and the construction, operation, and maintenance of related facilities. Any portion of the easement dedicated or granted herein shall refer to the owners, their successors and assigns as and to the extent said portion is declared unnecessary for flood control and drainage by the Board of Directors of the AMAFCA.

Initial Drainage Study Date:	December 1983
Drainage Study Name:	Drainage Report for Sandia Heights South Unit 15
Engineering Company of Record:	Bohannan - Huston, Inc
Engineer/Surveyor of Record:	Michael M. Emery P.E. & L.S. No.5194
Hydrologic Method & Reference:	For Basin A and analysis points 5 and 6, peak runoff flow rates were determined by acreage proportion of the Arroyo del Pino hydrology presented in the Northeast Heights Drainage Management plan prepared by Leonard Rice Consulting Engineers in April, 1975. For all other basins and analysis points, peak runoff flow rates and runoff volumes were computed with the Rational Formula in accordance with the guidelines established in Chapter 22 of the Albuquerque Development Process Manual (DPM). Flow depths and velocities in existing arroyos were computed with the Manning equation. Culverts were sized by use of the Manning equation and the orifice equation.
Storm Frequency and Duration:	100-year and SPF frequency / 6-hour duration

Other Drainage Studies:

Lot 1513 07-30-86	Lot 1508 04-07-86
Lot 1526 12-09-86	Lot 1536 07-09-86
Lot 1509 07-14-86	Lot 1512 01-22-87
Lot 1549 07-06-87	Lot 1514 04-26-88
Lot 1518 05-27-88	Lot 1510 06-10-88
Lot 1503 07-26-88	Lot 1568 08-30-88
Lot 1530 02-08-89	Lot 1569 1990
Lot 1507 1990	Lot 1502 1990
Lot 1501 1990	Lot 1525 1990
Lot 1511 11-03-93	Lot 1505 04-26-94
Lot 1506 04-26-94	

SANDIA HEIGHTS SOUTH
UNIT 16

Zone Atlas Map No:	D-23-Z
First Plat Date Filed:	30 September 1975 (C10-172)
Engineer/Surveyor of Record:	Robert B. Stephenson P.E. & L.S. No.2093
Subsequent Replat Dates:	09 September 1976, Tracts 3A, 3B (See Unit 19) 26 April 1979, Tracts 2A & 2B
Major Drainage Facility:	Domingo Baca Arroyo Tributary
Easements Shown on Plat:	Yes
Easement Types:	Only one 10' utility easement along the west boundary adjacent to Tramway Boulevard.

Notes:

1. An easement for utilities, seven feet in width, is reserved from each lot along each street right-of-way. Additional easements are indicated by dashed lines.

4. Natural drainage channels shall not be changed by any construction.

Drainage easements are dedicated, but there is no specific reference to whom the dedication will go.

Initial Drainage Study Date:	none found
Subsequent Drainage Study:	July 1979
Drainage Study Name:	Drainage Report, Unit 16, Sandia Heights South
Engineering Company of Record:	Bohannan - Huston, Inc
Engineer/Surveyor of Record:	Charles M. Easterling P.E. & L.S. No.6144
Hydrologic Method & Reference:	SCS Curve Number methodology and Rational Formula
Storm Frequency and Duration:	100-year frequency / 6-hour duration
Other Drainage Studies:	Lot 1603 02-25-93
Easement Maintenance:	No easement jurisdiction, or maintenance was noted in the report.

Conclusions:

"The development of this parcel will not cause an appreciable difference in the rainfall-runoff situation presently there. The minor arroyos are not a threat to life or property but should not be blocked by structures or roads. The larger arroyos's flood plains as delineated should be avoided entirely as building sites. Individual site grading plans should consider this drainage report and its recommendations based on the findings.

SANDIA HEIGHTS SOUTH
UNIT 17

Zone Atlas Map No:	D-23-Z
First Plat Date Filed:	12 February 1975
Engineer/Surveyor of Record:	A. Dwain Weaver P.L.S. No.6544
Subsequent Replat Dates:	11 October 1979 (D9-187) (including Lot 4 Unit 16) 16 September 1982 Lots 1707A, 1708A, 1709A 10 September 1987 Lots 4A-1, 2 & 3
Major Drainage Facility:	Pino Arroyo
Easements Shown on Plat:	Yes
Easement Types:	Shaded drainage easements traversing the northern and southern boundaries of the plat from east to west.

Notes: Natural drainage channels shall not be changed by any construction.

The subdivision of the land hereon described is with free consent and in accordance with the desires of the undersigned owner and proprietor thereof, and said owner and proprietor does hereby dedicate the public rights-of-way shown hereon, together with all easements shown on this plat. Power and communication easements are reserved where shown by dashed lines, except as noted, including the right of ingress and egress and the right to trim interfering trees. Any drainage right-of-ways shown hereon are also right-of-ways for underground sewer and water lines.

Drainage easements are dedicated, but there is no specific reference to whom the dedication will go.

Initial Drainage Study Date:	Unknown
Drainage Study Name:	Drainage Report For Unit 17, Sandia Heights South
Engineering Company of Record:	Bohannan - Huston, Inc
Engineer/Surveyor of Record:	Michael M. Emery P.E. & L.S. No.5194
Hydrologic Method & Reference:	NE Heights Management Plan and Abq. FIA mapping
Storm Frequency and Duration:	100-year frequency / 6-hour duration
Other Drainage Studies:	Lot 4A 06-25-87
Easement Maintenance:	No easement jurisdiction, or maintenance was noted in the report.

Conclusions: "Shown on the enclosed copy of the plat is the original flood plain in the area which was derived from the Northeast Heights Management Plan prepared in 1975. Also shown is the preliminary FIA maps."

SANDIA HEIGHTS SOUTH
UNIT 18 Tramway Terrace

Zone Atlas Map No:	D-23-Z
First Plat Date Filed:	02 April 1981 (C18-39)
Engineer/Surveyor of Record:	A. Dwain Weaver P.L.S. No.6544
Subsequent Replat Dates:	Lots 1866 and 1867 07-29-81 Lots 1801 and 1802 11-03-81
Major Drainage Facility:	South Domingo Baca Diversion (filed 12-01-79)
Easements Shown on Plat:	Yes
Easement Types:	Multiple drainage easements ranging in size from 5' to 10' between lots along the western boundary.

Notes: The subdivision of the land hereon described is with free consent and in accordance with the desires of the undersigned owner and proprietor thereof, and said owner and proprietor does hereby dedicate the public rights-of-way shown hereon, together with all easements shown on this plat. Power and communication easements are reserved where shown by dashed lines, except as noted, including the right of ingress and egress and the right to trim interfering trees. Any drainage right-of-ways shown hereon are also right-of-ways for underground sewer and water lines.

Drainage easements are dedicated, but there is no specific reference to whom the dedication will go.

Initial Drainage Study Date:	December 1980
Drainage Study Name:	Sandia Heights South, Unit 18 (Tramway Terrace)
Engineering Company of Record:	Bohannan - Huston, Inc
Engineer/Surveyor of Record:	Michael M. Emery P.E. & L.S. No.5194
Hydrologic Method & Reference:	Rational Formula, AMAFCA Drainage Resolution 72-2
Storm Frequency and Duration:	100-year frequency / 6-hour duration
Other Drainage Studies:	none found
Easement Maintenance:	No easement jurisdiction, or maintenance was noted in the report.

Conclusions: "The primary way in which this will be accomplished, is to designate a 10 foot wide drainage easement between Lots 33 and 34, which are located within Drainage Basin D."

"Drainage Basin C will flow from east to west. The drainage will be allowed to drain through a 5' wide drainage easement located on the northwest corner of each of the three cul-de-sacs.

"In complying with Drainage Resolution 1972-2 set forth by AMAFCA, the developed drainage flows do not exceed the undeveloped drainage flows. Therefore, no ponding should be required on-site, letting all of the developed runoff drain onto the right-of-way of Tramway Boulevard."

SANDIA HEIGHTS SOUTH
UNIT 19

Zone Atlas Map No:	D-23-Z
First Plat Date Filed:	20 October 1983 (C22-79) Tracts 3A & B Unit 16
Engineer/Surveyor of Record:	A. Dwain Weaver P.L.S. No.6544
Subsequent Replat Dates:	12 July 1984 (C24-118) Lots 1901A thru 1912A 21 April 1986 Lots 1924A, 1926A, 1928A
Major Drainage Facility:	Main Branch of the Pino Arroyo
Easements Shown on Plat:	Yes
Easement Types:	Two 20' wide drainage easements traverse the plat from east to west through the middle portion of the property.

Notes: The subdivision of the land hereon described is with free consent and in accordance with the desires of the undersigned owner and proprietor thereof, and said owner and proprietor does hereby dedicate the public rights-of-way shown hereon, together with all easements shown on this plat. Power and communication easements are reserved where shown by dashed lines, except as noted, including the right of ingress and egress and the right to trim interfering trees. Any drainage right-of-ways shown hereon are also right-of-ways for underground sewer and water lines.

The OPEN SPACE EASEMENT as shown on this plat is reserved exclusively as OPEN SPACE and no buildings, residences, or other structures can be constructed or stored within said OPEN SPACE.

The dedication noted, "Any drainage rights-of-way shown here are also rights-of-way to underground sewer and water lines".

Initial Drainage Study Date:	21 June 1983
Drainage Study Name:	Conceptual Drainage Plan, Sandia Heights Unit 19
Engineering Company of Record:	Bohannan - Huston, Inc
Engineer/Surveyor of Record:	Michael M. Emery P.E. & L.S. No.5194
Hydrologic Method & Reference:	Rational Formula, Chapter 22 Albuquerque DPM
Storm Frequency and Duration:	100-year frequency / 6-hour duration
Other Drainage Studies:	none found
Easement Maintenance:	Easement jurisdiction, or maintenance was not noted in the report.

Conclusions: "After development, runoff from the upper basin will continue to be conveyed through the site in approximately the same channels as now. Where necessary, these channels will be regraded within the drainage easements, and the banks will be stabilized. The typical channel section will be earth with a five or ten foot bottom and three-to-one side slopes. Flow depths will be less than one and one-half feet."

SANDIA HEIGHTS SOUTH
UNIT 20

Zone Atlas Map No:	D-23-Z
First Plat Date Filed:	10 April 1985 (C26-188)
Engineer/Surveyor of Record:	A. Dwain Weaver P.L.S. No.6544
Subsequent Replat Dates:	24 August 1988
Major Drainage Facility:	none due to South Domingo Baca Arroyo Diversion
Easements Shown on Plat:	Yes
Easement Types:	Utility, Waterline, Drainage and an Open Space and Drainage Easement.
Notes:	"The OPEN SPACE AND DRAINAGE EASEMENT (O.8986 Acre)... is reserved exclusively ... and no buildings, residences or other structures can be constructed or stored with said OPEN SPACE AND DRAINAGE EASEMENT."
Initial Drainage Study Date:	August 1984 revised November 1984
Drainage Study Name:	Drainage Report, Sandia Heights Unit 20
Engineering Company of Record:	Bohannan - Huston, Inc
Engineer/Surveyor of Record:	Daniel J. Grochowski P.E. No.8766
Hydrologic Method & Reference:	Rational Formula, Chapter 22 Albuquerque DPM
Storm Frequency and Duration:	100-year frequency / 6-hour duration
Other Drainage Studies:	none found
Easement Maintenance:	Easement dedicated, but there is no specific reference to whom the dedication will go.
Conclusions:	"The drainage under proposed conditions will eliminate the existing ponding area in Tramway Boulevard."
	"Onsite runoff will be conveyed to the northwest intersection of Quail Run Drive by the streets and associated borrow ditches. A dip section will be located at this intersection to direct the runoff to a 10 foot drainage easement and Tramway Boulevard."
	"Proposed offsite flows will be diverted by a berm and swale located on the east boundary of the site and conveyed to the Tramway Terrace right-of-way. The channel along the Tramway Terrace Loop will then convey this flow to the Tramway Boulevard Right-of-way. The existing ponding area will be regraded to flow north to the South Domingo Baca Channel."

SANDIA HEIGHTS SOUTH
UNIT 21 (Tract 1A-1 & 2A) Willow Bend

Zone Atlas Map No:	D-23-Z
First Plat Date Filed:	December 1982
Engineer/Surveyor of Record:	A. Dwain Weaver P.L.S. No.6544
Subsequent Replat Dates:	3 August 1983, 26 June 1991 (91C-129 & 127)
Major Drainage Facility:	None due to Tramway Boulevard to the east.
Easements Shown on Plat:	No
Easement Types:	n/a
Notes:	"The floodplain areas shown hereon are dedicated as easements to the AMAFCA, its successors and assigns, with the full and free consent and in accordance with the desire of the undersigned owner. This dedication is for drainage; flood control; and the construction, operation, and maintenance of related facilities. Any portion of any lands, right-of-way, easement dedicated or granted herein shall revert to the owner, its successors and assigns as and to the extent said portion is declared unnecessary for flood control and drainage by the Board of Directors of the AMAFCA."
Initial Drainage Study Date:	none found
Subsequent Drainage Study:	October 1986
Drainage Study Name:	Sandia Heights South, Tracts 1, 2, and 3
Engineering Company of Record:	Bohannan - Huston, Inc
Engineer/Surveyor of Record:	James Topmiller P.E. No.9354
Hydrologic Method & Reference:	SCS CN, and Rational Formula, Ch 22 Abq DPM, 03-82
Storm Frequency and Duration:	100-year frequency / 6-hour duration
Other Drainage Studies:	none found
Easement Maintenance:	No easement jurisdiction, or maintenance was noted in the report.
Conclusions:	"The goal will be accomplished by utilizing Tennyson Avenue and Tramway Boulevard right-of-way to divert developed flows north and south to floodplains." "As the Conceptual Drainage plan indicates, approximately 38 cfs of this storm runoff will be discharged in a sheet-flow manner to Tennyson Street."

SANDIA HEIGHTS SOUTH
UNIT 22 (Tract 2) (Vacant Tract)

Zone Atlas Map No:	D-23-Z
First Plat Date Filed:	23 December 1982
Engineer/Surveyor of Record:	A. Dwain Weaver P.L.S. No.6544
Subsequent Replat Dates:	3 August 1983 and 26 June, 1991
Major Drainage Facility:	None due to Tramway Boulevard to the east.
Easements Shown on Plat:	No
Easement Types:	n/a
Notes:	"The floodplain areas shown hereon are dedicated as easements to the AMAFCA, its successors and assigns, with the full and free consent and in accordance with the desire of the undersigned owner. This dedication is for drainage; flood control; and the construction, operation, and maintenance of related facilities. Any portion of any lands, right-of-way, easement dedicated or granted herein shall revert to the owner, its successors and assigns as and to the extent said portion is declared unnecessary for flood control and drainage by the Board of Directors of the AMAFCA."
Initial Drainage Study Date:	October 1986 one found
Subsequent Drainage Study:	Conceptual Study
Drainage Study Name:	Sandia Heights South, Tracts 1, 2, and 3
Engineering Company of Record:	Bohannan - Huston, Inc
Engineer/Surveyor of Record:	James Topmiller P.E. No.9354
Hydrologic Method & Reference:	SCS CN, and Rational Formula, Ch 22 Abq DPM, 03-82
Storm Frequency and Duration:	100-year frequency / 6-hour duration
Other Drainage Studies:	none found
Easement Maintenance:	No easement jurisdiction, or maintenance was noted in the report.
Conclusions:	"The goal will be accomplished by utilizing Tennyson Avenue and Tramway Boulevard right-of-way to divert developed flows north and south to floodplains." "This flow will continue to be discharged to Tennyson Street where it will be collected by the two existing 24" CMP culverts. Off-site flows, previously impacting this tract, have been diverted east of Tramway Boulevard and are further discussed....."

SANDIA HEIGHTS SOUTH
UNIT 23

Zone Atlas Map No:	D-23-Z
First Plat Date Filed:	23 December 1982 Tract 3A Lands Sandia Peak Tram Co.
Engineer/Surveyor of Record:	A. Dwain Weaver P.L.S. No.6544
Subsequent Replat Dates:	23 August 1983, 26 June 1991 (91C-128) and 18 October 1992
Major Drainage Facility:	None due to upstream diversions
Easements Shown on Plat:	Yes (labeled as flood plain area, not easement)
Easement Types:	Shaded flood plain area located on north side of San Rafael Avenue.
Notes:	"The floodplain areas shown hereon are dedicated as easements to the AMAFCA, its successors and assigns, with the full and free consent and in accordance with the desire of the undersigned owner. This dedication is for drainage; flood control; and the construction, operation, and maintenance of related facilities. Any portion of any lands, right-of-way, easement dedicated or granted herein shall revert to the owner, its successors and assigns as and to the extent said portion is declared unnecessary for flood control and drainage by the Board of Directors of the AMAFCA." "30' Public Storm Drainage Easement between Tennyson and Tramway granted to Bernalillo County with the filing of the plat."
Initial Drainage Study Date:	October 1986, Sandia Heights South, Tracts 1, 2, and 3
Subsequent Drainage Study:	March 1992
Drainage Study Name:	Sandia Heights South, Unit 23 Drainage Report
Engineering Company of Record:	Bohannan - Huston, Inc
Engineer/Surveyor of Record:	Maria A. Hinojos, P.E.
Hydrologic Method & Reference:	SCS CN, and Rational Formula, Ch 22 Abq DPM, 03-82
Storm Frequency and Duration:	100-year frequency / 6-hour duration
Other Drainage Studies:	none found
Easement Maintenance:	No easement jurisdiction, or maintenance was noted in the report.
Conclusions:	"The goal will be accomplished by utilizing Tennyson Avenue and Tramway Boulevard right-of-way to divert developed flows north and south to floodplains."

"Runoff will continue to flow westerly where a proposed swale along the western boundary will collect and transport it to the catch basins and storm sewer proposed near the southwest corner of the tract."

SANDIA HEIGHTS SOUTH
UNIT 22 (Tract 2) (Vacant Tract)

Zone Atlas Map No:	D-23-Z
First Plat Date Filed:	23 December 1982
Engineer/Surveyor of Record:	A. Dwain Weaver P.L.S. No.6544
Subsequent Replat Dates:	3 August 1983 and 26 June, 1991
Major Drainage Facility:	None due to Tramway Boulevard to the east.
Easements Shown on Plat:	No
Easement Types:	n/a
Notes:	"The floodplain areas shown hereon are dedicated as easements to the AMAFCA, its successors and assigns, with the full and free consent and in accordance with the desire of the undersigned owner. This dedication is for drainage; flood control; and the construction, operation, and maintenance of related facilities. Any portion of any lands, right-of-way, easement dedicated or granted herein shall revert to the owner, its successors and assigns as and to the extent said portion is declared unnecessary for flood control and drainage by the Board of Directors of the AMAFCA."
Initial Drainage Study Date:	October 1986 one found
Subsequent Drainage Study:	Conceptual Study
Drainage Study Name:	Sandia Heights South, Tracts 1, 2, and 3
Engineering Company of Record:	Bohannan - Huston, Inc
Engineer/Surveyor of Record:	James Topmiller P.E. No.9354
Hydrologic Method & Reference:	SCS CN, and Rational Formula, Ch 22 Abq DPM, 03-82
Storm Frequency and Duration:	100-year frequency / 6-hour duration
Other Drainage Studies:	none found
Easement Maintenance:	No easement jurisdiction, or maintenance was noted in the report.
Conclusions:	"The goal will be accomplished by utilizing Tennyson Avenue and Tramway Boulevard right-of-way to divert developed flows north and south to floodplains." "This flow will continue to be discharged to Tennyson Street where it will be collected by the two existing 24" CMP culverts. Off-site flows, previously impacting this tract, have been diverted east of Tramway Boulevard and are further discussed....."

SANDIA HEIGHTS SOUTH
UNIT 23

Zone Atlas Map No:	D-23-Z
First Plat Date Filed:	23 December 1982 Tract 3A Lands Sandia Peak Tram Co.
Engineer/Surveyor of Record:	A. Dwain Weaver P.L.S. No.6544
Subsequent Replat Dates:	23 August 1983, 26 June 1991 (91C-128) and 18 October 1992
Major Drainage Facility:	None due to upstream diversions
Easements Shown on Plat:	Yes (labeled as flood plain area, not easement)
Easement Types:	Shaded flood plain area located on north side of San Rafael Avenue.
Notes:	"The floodplain areas shown hereon are dedicated as easements to the AMAFCA, its successors and assigns, with the full and free consent and in accordance with the desire of the undersigned owner. This dedication is for drainage; flood control; and the construction, operation, and maintenance of related facilities. Any portion of any lands, right-of-way, easement dedicated or granted herein shall revert to the owner, its successors and assigns as and to the extent said portion is declared unnecessary for flood control and drainage by the Board of Directors of the AMAFCA." "30' Public Storm Drainage Easement between Tennyson and Tramway granted to Bernalillo County with the filing of the plat."
Initial Drainage Study Date:	October 1986, Sandia Heights South, Tracts 1, 2, and 3
Subsequent Drainage Study:	March 1992
Drainage Study Name:	Sandia Heights South, Unit 23 Drainage Report
Engineering Company of Record:	Bohannan - Huston, Inc
Engineer/Surveyor of Record:	Maria A. Hinojos, P.E.
Hydrologic Method & Reference:	SCS CN, and Rational Formula, Ch 22 Abq DPM, 03-82
Storm Frequency and Duration:	100-year frequency / 6-hour duration
Other Drainage Studies:	none found
Easement Maintenance:	No easement jurisdiction, or maintenance was noted in the report.
Conclusions:	"The goal will be accomplished by utilizing Tennyson Avenue and Tramway Boulevard right-of-way to divert developed flows north and south to floodplains."

"Runoff will continue to flow westerly where a proposed swale along the western boundary will collect and transport it to the catch basins and storm sewer proposed near the southwest corner of the tract."

SANDIA HEIGHTS SOUTH
UNIT 24

Zone Atlas Map No:	D-23-Z
First Plat Date Filed:	23 December 1982 Tract 4A Lands of Sandia Peak Tram
Engineer/Surveyor of Record:	A. Dwain Weaver P.L.S. No.6544
Subsequent Replat Dates:	3 August 1983 (C21-176), 4 March 1987 (C33-14) 27 September 1991
Major Drainage Facility:	None due to upstream diversions
Easements Shown on Plat:	Yes
Easement Types:	Storm sewer, sanitary sewer, utility and private access, utility and drainage.
Notes:	"The floodplain areas shown hereon are dedicated as easements to the AMAFCA, its successors and assigns, with the full and free consent and in accordance with the desire of the undersigned owner. This dedication is for drainage; flood control; and the construction, operation, and maintenance of related facilities. Any portion of any lands, right-of-way, easement dedicated or granted herein shall revert to the owner, its successors and assigns as and to the extent said portion is declared unnecessary for flood control and drainage by the Board of Directors of the AMAFCA."
Initial Drainage Study Date:	none found
Subsequent Drainage Study:	November 1986
Drainage Study Name:	Sandia Heights South, Between Tramway Boulevard and Tennyson Street
Engineering Company of Record:	Bohannan - Huston, Inc
Engineer/Surveyor of Record:	James Topmiller P.E. No.9354
Hydrologic Method & Reference:	SCS CN, and Rational Formula, Ch 22 Abq DPM, 03-82
Storm Frequency and Duration:	100-year frequency / 6-hour duration
Other Drainage Studies:	none found
Easement Maintenance:	"10' storm sewer easement was granted to Bernalillo County with the filing of the plat."
Conclusions:	"This drainage master plan is intended to be a rough conceptual guide only."

SANDIA HEIGHTS SOUTH
UNIT 25 (Tramway Terrace)

Zone Atlas Map No:	D-23-Z
First Plat Date Filed:	04 October 1984 D25-46
Engineer/Surveyor of Record:	A. Dwain Weaver P.L.S. No.6544
Subsequent Replat Dates:	None found
Major Drainage Facility:	None due to Tramway Boulevard to the east.
Easements Shown on Plat:	Yes
Easement Types:	Eight foot wide drainage and utility easements on lots 2523, 2533 and 2534.
Notes:	Private access, drainage and utility easements on lots 2534, 3637, 2511, 2527, 2529,2530, 2505, 2502 and 2506. The plat includes dedication of public utility easements and shows several private access, drainage and utility easements.
Initial Drainage Study Date:	February 1984
Drainage Study Name:	Drainage Report, Sandia Heights South, Unit 25
Engineering Company of Record:	Bohannan - Huston, Inc
Engineer/Surveyor of Record:	Daniel J. Grochowski P.E. No.8766
Hydrologic Method & Reference:	Rational Formula, Chapter 22 Albuquerque DPM, 03-82
Storm Frequency and Duration:	100-year frequency / 6-hour duration
Other Drainage Studies:	none found
Easement Maintenance:	No easement jurisdiction, or maintenance was noted in the report.
Conclusions:	"All of the on-site flow is intercepted by the South Domingo Baca Dam approximately 0.6 miles west of the site." "Runoff from the north portion of the site will be conducted in roadside swales north toward the existing North Domingo Baca Diversion Channel. Runoff from the south portion of the site will be conveyed in roadside swales to the existing arroyo north of Pino Avenue."

SANDIA HEIGHTS SOUTH
UNIT 26 (Tract 8)
Sandia Colony Subdivision

Zone Atlas Map No:	C-23
First Plat Date Filed:	
Subsequent Replat Filed:	
Engineer/Surveyor of Record:	Goodwin & Assoc
Major Drainage Facility:	
Easements Shown on Plat:	Yes
Easement Types:	Roadway, Utility and Drainage
Notes:	A flood zone, currently not receiving off site runoff, exists through the center of the sirte but is subject to a future letter of map revision due to drainage improvements on Tramway Boulevard.
Initial Drainage Study Date:	April 1989
Subsequent Drainage Studies:	July 1994
Drainage Study Name:	Sandia Colony Unit 26 Sandia Heights South
Engineering Company of Record:	D. Mark Goodwin & Associates
Engineer/Surveyor of Record:	John M. Mackenzie, P.E. No. 11619
Hydrologic Method & Reference:	City of Albuquerque DPM Chapter 22.2
Storm Frequency and Duration:	100 year/6 hour
Other Drainage Studies:	
Easement Maintenance:	
Conclusions:	All drainage flows go directly to the South Domingo Baca channel before the upstream peak flow arrives.

SANDIA HEIGHTS SOUTH
UNIT 27 (Tract 9)

Zone Atlas Map No:	D-23-Z
First Plat Date Filed:	23 December 1982 C20-127 Tracts 1 - 12 L of S P T Co
Engineer/Surveyor of Record:	A. Dwain Weaver P.L.S. No.6544
Subsequent Replat Dates:	05 June 1984 C24-42 Tract 9 Lands of S P T Co. 13 March 1986 (Tract A to 27B & 27C) 16 March 1988 (replatted into Unit 27B) 04 January 1991 (Tract C replatted)
Major Drainage Facility:	La Cueva Arroyo and North Domingo Baca Arroyo
Easements Shown on Plat:	Yes to AMAFCA
Easement Types:	Shaded flood plain area is located along northern boundary and through middle of Tract 9, between Tracts 27B and 27 C.
Notes:	"The floodplain areas shown hereon are dedicated as easements to the AMAFCA, its successors and assigns, with the full and free consent and in accordance with the desire of the undersigned owner. This dedication is for drainage; flood control; and the construction, operation, and maintenance of related facilities. Any portion of any lands, right-of-way, easement dedicated or granted herein shall revert to the owner, its successors and assigns as and to the extent said portion is declared unnecessary for flood control and drainage by the Board of Directors of the AMAFCA."
Initial Drainage Study Date:	none found
Subsequent Drainage Study:	November 1986
Drainage Study Name:	Sandia Heights South, Between Tramway Boulevard and Tennyson Street
Engineering Company of Record:	Bohannan - Huston, Inc
Engineer/Surveyor of Record:	James Topmiller P.E. No.9354
Hydrologic Method & Reference:	SCS CN, and Rational Formula, Ch 22 Abq DPM, 03-82
Storm Frequency and Duration:	100-year frequency / 6-hour duration
Other Drainage Studies:	Drainage Report For Sandia Heights South, Unit 27 Drainage Report For Sandia Heights South, Unit 27B & C, July 1985 Sediment Transport Analysis For Sandia Heights South, Unit 27B & C, June 1993

Unit 27B

Lot 2742	04-09-91	Lot 2728	1991

Unit 27C

Lot 2773	1991	Lot 2771A	04-17-91
Lot 2770A	1991	Lot 2768A	1991
Lot 2757	1992		

Easement Maintenance: AMAFCA responsibility.

Conclusions: "This drainage master plan is intended to be a rough conceptual guide only."

"The drainage plan for Sandia Heights South, Unit 27A, consists primarily of diverting runoff from the site to established arroyos to the north."

SANDIA HEIGHTS SOUTH
UNIT 28 Brushwood Subdivision

Zone Atlas Map No:	C-23-Z
First Plat Date Filed:	23 December 1982 C20-127 Tracts 1 - 12 Lands S P T Co
Subsequent Replat Filed:	04 October 1984 (Tract 10, Unit 28) C25-47
Engineer/Surveyor of Record:	A. Dwain Weaver P.L.S. No.6544
Other Replat Dates:	20 October 1986, 16 March 1982 and 16 November 1990
Major Drainage Facility:	No due to upstream diversions Boulevard.
Easements Shown on Plat:	Yes
Easement Types:	A single 10' wide drainage easement between lots 2817 and 2818, lots 2803 and 2804, and lots 2803 and 2805.
Notes:	No easement or maintenance dedication noted on plat.
Initial Drainage Study Date:	April 1984
Subsequent Drainage Studies:	June 1986
Drainage Study Name:	Drainage Report For "The Brushwood" Sandia Heights South, Unit 28
Engineering Company of Record:	Bohannan - Huston, Inc
Engineer/Surveyor of Record:	Daniel J. Grochowski P.E. No.8766
Hydrologic Method & Reference:	Rational Formula, Chapter 22 Albuquerque DPM, 03-82
Storm Frequency and Duration:	100-year frequency / 6-hour duration
Other Drainage Studies:	none found
Easement Maintenance:	No easement jurisdiction, or maintenance was noted in the report.
Conclusions:	"Currently, construction plans have been prepared to construct a diversion ditch adjacent to the Tramway Boulevard east pavement edge. The diversion will intercept the 71 cfs of runoff currently being discharged to the site through the two 36" culverts and divert the runoff south to the 40' AMAFCA easement adjacent to Cedar Hill Road. The AMAFCA easement discharges its flows to an existing flood plain located west of Tennyson Avenue. "The drainage plan for Sandia Heights South, Unit 28, consists primarily of diverting off-site flows to an underground storm drain and preventing it from impacting the site. All on-site runoff will also be directed to the storm drain and discharge to the La Cueva Arroyo Floodway."

SANDIA HEIGHTS SOUTH
UNIT 28 - B

Zone Atlas Map No:	C-23
First Plat Date Filed:	23 December 1982 C20-127 Tracts 1 - 12 L of S P T Co
Subsequent Replat Filed:	04 October 1984 (Tract A) and 27 October 1986 (C31-179)
Engineer/Surveyor of Record:	A. Dwain Weaver P.L.S. No.6544
Major Drainage Facility:	None
Easements Shown on Plat:	Yes
Easement Types:	Public sanitary sewer, private drainage, PNM 2 communication, public drainage.
Notes:	5' private drainage to allow Lot 2872 storm runoff to drain across Lot 2871. 5' private drainage to allow Lot 2869 storm runoff to drain across Lot 2868.
Initial Drainage Study Date:	
Subsequent Drainage Studies:	
Drainage Study Name:	
Engineering Company of Record:	
Engineer/Surveyor of Record:	
Hydrologic Method & Reference:	
Storm Frequency and Duration:	
Other Drainage Studies:	
Easement Maintenance:	
Conclusions:	"The public drainage easement is dedicated by the plat, but no ownership or maintenance identity is made." "The drainage plan for Sandia Heights South, Unit 28, consists primarily of diverting off-site flows to an underground storm drain and preventing it from impacting the site. All on-site runoff will also be directed to the storm drain and discharge to the La Cueva Arroyo Floodway."

SANDIA HEIGHTS SOUTH
UNIT 28 - C Brushwood North Subdivision

Zone Atlas Map No:	C-23
First Plat Date Filed:	23 December 1982 (Tracts 1 - 12 L of S P T Co) (C20-127)
Subsequent Replat Filed:	22 October 1986 (Tract A-1 Sandia Heights South, Unit 28-B) (C31-179), 16 November 1990 (Unit 28C, includes proposed Unit 29, Tract 11 Lands of S P T Co) (90C-281)
Engineer/Surveyor of Record:	A. Dwain Weaver P.L.S. No.6544
Major Drainage Facility:	None
Major Drainage Facility:	None
Easements Shown on Plat:	Yes
Easement Types:	Public drainage utility, private drainage, public utility.

Notes:

1. The 8' wide Private Wall and Drainage Easement along the back lot lines through lots 2873, 2874, 2875, 2876, 2877, 2878, 2879, 2880, 2881, 2882, 2883, 2884, 2885, 2886, 2887, 2888 and 2889 is provided for the use and benefit of lots 2873 thru 2889. Wall improvements shall be maintained by the owners of lots 2873 thru 2889. Drainage improvements shall be maintained by the owners of lots 2873 thru 2880.

2. The common 5' wide private drainage easements on the side lot lines is provided for the use and benefit of the adjoining lots and is to be maintained by the owners of same lots.

3. The 5' wide Private Drainage Easement along the back lot lines through lots 2890, 2891, 2892, 2893, 2894, 2895, 2896, 2897, 2898 and 2899 is provided for the use and benefit of lots 2890 thru 2900 and shall be maintained by the owners of lots 2890 thru 2899.

Initial Drainage Study Date:	December 1989
Subsequent Drainage Studies:	
Drainage Study Name:	Drainage Report for "Brushwood North Subdivision" Sandia Heights South, Unit 28C
Engineering Company of Record:	Bohannan - Huston, Inc
Engineer/Surveyor of Record:	James Topmiller P.E. No.9354
Hydrologic Method & Reference:	Rational formula, City of Albuquerque DPM Sec. 2.2
Storm Frequency and Duration:	100 year/6 Hour
Other Drainage Studies:	
Easement Maintenance:	Public street rights-of-way and public drainage easements by Bernalillo County.

NORTH ALBUQUERQUE ACRES
TRACT 2 UNIT 1 - Block 5 & 7
Primrose Point Subdivision Unit 1

Zone Atlas Map No:	C-22
First Plat Date Filed:	08 June 1931
Engineer/Surveyor of Record:	C.A. Spirock, L.S. No. 4972
Subsequent Replat Dates:	1994
Other Replat Dates:	None
Major Drainage Facility:	North Domingo Baca Arroyo
Easements Shown on Plat:	Yes
Easement Types:	AMAFCA Drainage Easement for North Domingo Baca Arroyo, Public Utilities and Drainage

Notes: Unit 1 is composed of lots 16 through 25, Block 11 and Lots 3 through 30, Block 13, together with the right-of-way for Corona Avenue NE adjacent to Lots 17 through 25.

Initial Drainage Study Date:	July 1993
Subsequent Drainage Studies:	None
Drainage Study Name:	Drainage Report for Primrose Pointe Subdivision Unit 1
Engineering Company of Record:	Community Sciences Corporation
Engineer/Surveyor of Record:	James D. Hughes, P.E. No. 11874
Hydrologic Method and Reference:	AHYMO and Section 22.2 of the City of Albuquerque Development Process Manual
Storm Frequency and Duration:	100 year, 6 hour

Other Drainage Studies: None

Easement Maintenance: "AMAFCA drainage easement - Dedication to the Albuquerque Metropolitan Flood Control Authority, Grantee, its successors and assigns, of lands, right-of-ways, and easements designated herein as "Flood Plain Easement" or "Drainage Easement" is with the full and free consent and in accordance with the desire of the undersigned owner, Grantor. This dedication is for drainage, floor control, conveyance of storm water, and the construction, operation, and maintenance of, and access to such facilities, and for subordinate recreational use and access on such facilities. Except by the written approval of Grantee, no fence, wall, building, or other obstruction may be placed or maintained in said easements, and there shall be no alteration of the grades or contours in said easement. The granting of said easement shall not obligate the Grantee to maintain natural arroyos, drainage channels, or facilities that do not meet the standards of the Grantee for design and construction, nor shall this granting require the protection of property lying outside of the easement granted. Grantee shall only maintain property and /or improvements that it specifically agrees, by written agreement filed for public record, to maintain. Unless Grantee specifically agrees, by such written agreement, to maintain property and/or improvements, such maintenance responsibility shall remain with the Grantor, its successors or assigns. Landscaping or maintenance work, by the Grantor, within the easement hereby conveyed shall not alter the present flow line, capacity, or permeability of the present

NORTH ALBUQUERQUE ACRES
TRACT 2 UNIT 1 APS School Site

Zone Atlas Map No:	C-22-Z
First Plat Date Filed:	23 March 1931 D-130
Engineer/Surveyor of Record:	Not shown, approved by County Surveyor
Subsequent Replat Dates:	
Major Drainage Facility:	La Cueva Arroyo
Easements Shown on Plat:	No
Easement Types:	n/a

Notes: School site is composed of lots 1 - 5 and 28 - 32, Block 4 and lots 1 - 5 Block 6 and the vacated portion of Oakland Ave.

(No drainage easement dedication or maintenance notes on plat)

Initial Drainage Study Date:	
Drainage Study Name:	
Engineering Company of Record:	Jeff Mortensen & Associates Inc.
Engineer/Surveyor of Record:	Jeffrey G. Mortensen, P.E. No. 8547
Hydrologic Method and Reference:	n/a
Storm Frequency and Duration:	n/a

flood way area, except in an emergency. If emergency work is performed, Grantor shall notify the Grantee as soon as practical thereafter. Grantee will then determine if the emergency work can remain or must be removed or modified. Safe locations for structures built on lands adjacent to the real property described herein may be substantially outside of the area described herein. Any portion of any lands, right-of-way or easement granted herein shall revert to the Grantor, its successors or assigns, as and to the extent said portion is declared unnecessary for flood control or drainage by the Board of Directors of the Albuquerque Metropolitan Arroyo Flood Control Authority. Any reversion shall be conveyed by Quitclaim Deed. Vacation approval consistent with the City of Albuquerque or Bernalillo County Subdivision ordinances will also be required."

"Drainage Easements" as shown here are granted to Bernalillo County for the purpose of installing, maintaining, accessing and inspecting drainage facilities. No walls, fences, landscaping or other obstruction will be allowed within these easements.

Conclusions: A portion of the following lots lie within the 100-Year Flood Boundary Zone AO (Depth 1 FT) as shown on flood insurance rate may (firm) Community Panel Number 350002 0011C effective October 14, 1983 for the City of Albuquerque, New Mexico, Bernalillo County:

Block 1 Lot 3	Block 1 Lot 4	Block 1 Lot 5	Block 1 Lot 6
Block 1 Lot 7	Block 1 Lot 8	Block 1 Lot 12	Block 5 Lot 1
Block 5 Lot 2	Track D		

This flood plain is to be removed from the individual lots and confined solely to Tract D in conjunction with the development of this Subdivision. These changes to the 100-Year Flood Boundary are to be made official by the issuance of a "Letter(s) of Map Revision (LOMR'S)" by the Federal Emergency Management Agency (FEMA) after the construction is completed and properly documented to FEMA. It is the developer's responsibility to provide for both the construction and the documentation to FEMA.

Additionally, the above referenced Firm shows portions of Tract A, Tract XX and Tract YY as being in the 100-Year Flood Boundary.

NORTH ALBUQUERQUE ACRES
TRACT 2 UNIT 2

Zone Atlas Map No:	D-22-Z
First Plat Date Filed:	08 June 1931 D-131
Engineer/Surveyor of Record:	Not shown, approved by County Surveyor
Subsequent Replat Dates:	Lots 30-A & 32-A Block 7 06-10-86
	Lots 1-A,2-A,3-A,4-A Block 7 05-05-89
Major Drainage Facility:	Domingo Baca Arroyo, North Pino Arroyo
Easements Shown on Plat:	No
Easement Types:	n/a

Notes: Each lot, including to center of adjoining street is one acre unless otherwise indicated.

(No drainage easement dedication or maintenance notes on plat)

Initial Drainage Study Date:	none
Drainage Study Name:	n/a
Engineering Company of Record:	n/a
Engineer/Surveyor of Record:	n/a
Hydrologic Method and Reference:	n/a
Storm Frequency and Duration:	n/a

Subsequent Drainage Studies:

Lot 25, 26	Block 9 04-17-85
Lot 28	Block 7 06-25-87
Lot 15-18	Block 16 08-29-90
Lot 10	Block 15 08-19-86
Lot 26	Block 7 08-19-86
Lot 17,18	Block 15 08-19-86
Lot 15	Block 17 08-19-86
Lot 1	Block 15 08-19-86
Lot 32	Block 13 08-09-91
Lot 19	Block 15 10-04-91
Lot 6	Block 15 10-04-91
Lot 27	Block 7 08-06-92
Lot 13	Block 15 01-19-93
Lot 32A	Block 7 04-12-93
Lot 2	Block 9 04-12-93

Drainage Easements: n/a

Easement Maintenance: n/a

NORTH ALBUQUERQUE ACRES
TRACT 3 UNIT 1

Zone Atlas Map No:	B-21 & C-21
First Plat Date Filed:	08 June 1931
Engineer/Surveyor of Record:	Not shown, approved by County Surveyor
Subsequent Replat Dates:	n/a
Major Drainage Facility:	Domingo Baca Arroyo, North Pino Arroyo
Easements Shown on Plat:	No
Easement Types:	n/a

Notes: Each lot, including to center of adjoining street is one acre unless otherwise indicated.

(No drainage easement dedication or maintenance notes on plat)

Initial Drainage Study Date: none

Drainage Study Name:	n/a
Engineering Company of Record:	n/a
Engineer/Surveyor of Record:	n/a
Hydrologic Method and Reference:	n/a
Storm Frequency and Duration:	n/a

Subsequent Drainage Studies:

Lot 5	Block C	01-15-86	Lot 24	Block C	07-02-91
Lot 19	Block A	09-12-91	Lot 26	Block 1	11-06-85
Altamont Baseball Park		07-29-86			
Lot 3	Block 13	06-29-92	Lot 2	Block 1	07-02-92
Lot 29	Block 1	07-21-92	Lot 6	Block 13	08-10-92
Lot 31	Block 13	10-06-92	Lot 27	Block C	03-01-93
Lot 2	Block 6	05-24-93	Lot 23	Block 15	05-24-93
Lot 28	Block 1	05-28-93	Lot 5	Block 13	06-24-93
Lot 32	Block 1	06-24-93	Lot 32	Block C	12-08-93
Lot 27	Block 11	12-08-93	Lot 23 & 24	Block A	12-29-93
Lot 17 & 18	Block 1	06-16-94	Lot 21	Block A	07-07-94
Lot 8	Block 13	1994			

Drainage Easements: n/a

Easement Maintenance: n/a

NORTH ALBUQUERQUE ACRES
TRACT 3 UNIT 2

Zone Atlas Map No:	D-21
First Plat Date Filed:	08 June 1931
Engineer/Surveyor of Record:	Not shown, approved by County Surveyor
Subsequent Replat Dates:	Lots 17-A, 18A Block 12 12-17-87
Major Drainage Facility:	Domingo Baca Arroyo, North Pino Arroyo
Easements Shown on Plat:	No
Easement Types:	n/a

Notes: Each lot, including to center of adjoining street is one acre unless otherwise indicated.

(No drainage easement dedication or maintenance notes on plat)

Initial Drainage Study Date: none

Drainage Study Name:	n/a
Engineering Company of Record:	n/a
Engineer/Surveyor of Record:	n/a
Hydrologic Method and Reference:	n/a
Storm Frequency and Duration:	n/a

Subsequent Drainage Studies:

Lot 10	Block 17	10-07-87
Lot 25	Block 3	05-08-90
Lot 9	Block 17	06-01-93
Lot 29 - 32	Block 3	07-28-93
Lot 27	Block 3	07-28-93

Drainage Easements: n/a

Easement Maintenance: n/a