

III. CONDITIONS

INFRASTRUCTURE

Water

Water supply for domestic use is a major priority for residents in the plan area. Currently, all residents in the Tijeras Canyon/Carnuel area depend on individual wells for domestic water. The production of wells is dependent on the geological formation into which the wells are drilled and the water production characteristics of that formation. For example, wells in Carnuel range from around 60 feet in depth for older homes located near the creek to wells nearly 400 feet deep in homes located at higher elevations. The production of wells varies throughout the study area with some wells producing just a couple of gallons a minute to wells that produce close to 10 gallons a minute. In recent years, many older shallow wells have gone dry and have been replaced by wells that are drilled deeper into the water table.

Water quality for domestic use is very poor in some parts of the study area. Naturally occurring minerals such as arsenic and fluoride are abundant in ground water sources. The Carnuel area has a significant groundwater quality issue and may be the most difficult water quality problem to resolve within Bernalillo County. The area has an overwhelming number of non-compliant wastewater systems contributing to seepage into wells resulting in high levels of nitrates and other pollution in the ground water.

A location of documented contamination is the site of the former Gulton Industries facility, now known as the *Gulton Site*, located at the western boundary of the Tijeras Canyon/Carnuel Plan area immediately south of Old Route 66 and east of the Albuquerque municipal limits. Previous activities on the site have created a plume of approximately 70 acres and of unknown depth containing ground water contaminants including trichloroethylene (TCE), vinyl chloride and other volatile organic compounds (VOCs). Approximately 20 monitoring wells have been drilled to investigate the plume and help determine its horizontal and vertical extent. The contaminants found there could pose a cancer risk and therefore may qualify the Gulton Site as a superfund site once the plume investigation is complete. It is indicated that wells located 200 feet or more away from the 70-acre plume are in no danger. Future development of drinking water wells near this plume may not be approved by the State Engineer's Office, the New Mexico Environment Department or the Bernalillo County Office of Environmental Health. New wells have the potential to tap into the plume or reshape and move the plume in an unknown manner. Future development of the area may require offsite water supply.

Existing Data

In 1998, the City of Albuquerque commissioned Boyle Engineering Corporation to prepare the *Water Master Plan 1998 supplement/Part A-Tijeras Canyon Water Service Extension*. The purpose of the document was to present information about the "transmission and distribution lines and water storage reservoir requirements if the City of Albuquerque water system service area extends east into Tijeras Canyon." (P.1). It was assumed that there

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would be residential as well as commercial water use. The master plan area covers the same areas as this Tijeras Canyon/Carnuel Plan. The existing Escondido Reservoir is located in the Manzano/Four Hills Open Space (City of Albuquerque) almost at the western boundary of the Four Hills Partnership property. A new Escondido Pump Station and a new reservoir, referred to as 12E Reservoir, would be added as well as several lines in order for water to be transported from the existing reservoir to the east side of the plan boundary (Dead Man's Curve). The master plan would include a new Escondido Pump Station, 12-inch and 16-inch diameter 8E trunk lines from Escondido Reservoir to the east boundary of the master plan area, 12-inch and 16-inch diameter trunk lines from 12E Reservoir to Zone 12E north of Interstate 40 (Monticello), a 10-inch diameter transmission line from the pump station to the 12E Reservoir, the 12E Reservoir, and the 8ER PRV Station. The new 12E Reservoir would be built approximately 1/3-mile southeast of Silver Hills Lane, at the border with Coyote Springs Master Plan area. Subdivision plans and legally granted accesses would dictate where facilities are placed.

In 2000, under the direction of Bernalillo County Public Works Division, Parson-Brinkerhoff completed the *Update on the Feasibility of Sanitary Sewer/Water Systems for the West Tijeras Canyon Area*, as an update to the 1996 West Tijeras Canyon study. The study provided estimated construction cost as well as recommended that further study be undertaken and public meetings be held to understand the need for water and wastewater services.

Wastewater

A major concern for the Carnuel community is that wastewater systems and shallow wells do not comply with current County ordinances. Residents who participated in the planning process believe that foremost attention should be given to resolving these problems within existing development. These properties need to comply with new water and wastewater ordinances. New Mexico Environment Department and Bernalillo County Environmental Health's regulations require $\frac{3}{4}$ of an acre and adequate site conditions to place a standard wastewater system. However, a number of these lots are smaller than $\frac{3}{4}$ of an acre. Many Carnuel residents are concerned about remaining in Carnuel in the future because they are unable to afford bringing current septic systems up to current standards. In public meetings, there was strong support for connecting residents in higher density areas to sewer service.

Existing Data

In 1998, the City of Albuquerque drafted a *Wastewater Master Plan* along with a *Supplement for the Tijeras Canyon Area*. This plan recognized the infrastructure issues of the area and proposed a means of establishing wastewater service in Tijeras Canyon. According to this plan, a new conveyance system could be located on the south side of I-40 connecting to the existing Tijeras Interceptor but would not include collector sewers. It would be able to accept sewage from existing developments and potential new developments, and include connections to those developments not adjacent to the main conveyance route. Each development would be responsible for delivering the sewage to a

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point of connection to the conveyance system. The existing 8" force main has pumping facilities and serves six connections in Tijeras Village. This force main connects to the City of Albuquerque's Tijeras 5-A Interceptor at manhole L23-671. A new 6" force main could be established to connect to this same interceptor and could extend east into Coyote Springs for 1100 feet, east of the Coyote Springs access road. Subdivision access could include direct connections of the Chant property and West Tijeras Canyon Estates to existing L23-671 manhole or a new manhole and it would not be necessary to pump into the force main. Developers of the Coyote Springs Master Plan area and other nearby subdivisions would have to install gravity collection systems to get wastewater flow to a lift station that would take the entire flow to the new force main. Another lift station (also serving as an injection station) could be installed below the east side of the Frontage Rd. bridge crossing to receive wastewater from Four Hills Associates properties and other sites south of I-40.

Transportation

The main transportation routes in the plan area are Interstate 40 (I-40) and NM 333 (Old Route 66), to which private easements and subdivision roads link, creating a network (See Appendix C, p. 31).

Old Route 66 (NM 333) is the primary road used by the local community to travel to and from their residences, businesses, Albuquerque, and the greater East Mountain Area. This historic route was an original portion of the famous Turquoise Trail. Today, its significance continues to be recognized by residents and government agencies. The New Mexico Department of Transportation (NMDOT) and the United States Department of Transportation-Federal Highway Administration have designated this alignment of Route 66/NM 333 as a Scenic Byway under the National Scenic Byways Program. This road is also part of the National Park Service's Route 66 Corridor Preservation Program. Grant funding and support may be available through these agencies to aid in the protection of the cultural and historic elements of the corridor.

In general, Bernalillo County recognizes roads as either public or private, regardless of size or current condition. Public roads are maintained by government agencies, whereas private roads are the responsibility of property owners (individually or collectively). The Bernalillo County Public Works Division keeps data and maps verifying road ownership and maintenance responsibilities. Although current roads, including numerous dirt roads, exist in varying conditions, all new roads, whether public or private, must meet Bernalillo County ordinances and standards. Any road being newly built, used, and or acquired must include a fire apparatus access road that should never be obstructed.

By and large, the wider, heavily accessed roads are categorized as public roads. These include, for example, Coyote Springs Road in Carnuel and the bridge, maintained by Bernalillo County; I-40 and Frontage Road, maintained by New Mexico Department of Transportation. The priority for Bernalillo County is to eventually pave all the roads under its jurisdiction.

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Smaller, less frequently accessed roads are likely to be privately owned. These are typically easements and internal roads within subdivisions that ultimately connect to public roads. Non-complying private roads may be steep and unpaved, and prone to erosion. Residents who use these roads and are responsible for their maintenance must take extra precautions when roads become eroded. Examples of improved private roads can be found in Monticello, Silver Hills Neighborhood, and Caballo de Fuerza Neighborhood. The size, condition, and signage of these roads facilitate access for large delivery truck and emergency vehicles.

Other Public Utilities

Throughout the planning process, there was little discussion of concerns regarding the improvements for cable, phone, or electricity utility services in the plan area. However, concern was expressed for improving the availability of natural gas service in the planning area. Although gas utilities already exist in the plan area, many of the study area's residents are on individual propane tanks. Despite the significant rise in costs of these fuels, residents support the extension of natural gas utilities throughout the planning area.

NATURAL RESOURCES

The following section provides general information about the environment and natural resource conditions in the Tijeras Canyon/Carnuel Plan area.

Soils

Soils include the alluvium of Tijeras Arroyo that contains beds comprised of sandstone, gneiss, limestone, and granite. Much of the areas soils derived from Tijeras Canyon, but areas of bedrock and resulting weathered gravel also exist throughout the plan area. These areas, also known as Orthids soils typically occur where bedrock materials are limestone, sandstone, or schist and have been exposed at the surface. These soils are typically thin to very thin, and contain large amounts of oversized materials. There is little to no vegetation with this soil type. Where soils are recognizably present, they are generally classified as Tijeras sandy loam. Major and minor faults dissect the area, and resultant fracturing allows water to flow through the bedrock formations. These fractures, as well as overlying alluvium in the valleys, are the water source for the wells in the area. Many septic systems were placed before the promulgation of any wastewater ordinances by Bernalillo County in 1973. Soil limitations in the study area have contributed to groundwater contamination resulting from individual septic disposal systems. These issues by and large plague the Carnuel community in which most conventional septic systems were placed by carving into rock openings. The location of these systems does not allow water discharge into the soil and septic system discharge flows down fractures into water sources. The elimination of individual wells and septic tanks in high density development in favor of centralized infrastructure is a priority recommendation of the residents who participated in the planning process.

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Elevation

The elevation in the plan area ranges from approximately 5,600 feet to approximately 6,600 feet. The planning area's lowest point is at the Tijeras Creek located within the Tijeras Watershed. This watershed begins at the top of the east slope of south Sandia Peak and has an elevation of 9,782 feet. Tijeras Canyon, located in the plan area, contributes to the drastic changes in elevation. For example, the change in elevation from the north edge of Echo Canyon to the bottom of the Tijeras Creek is approximately 1,000 feet.

Slopes, Drainage, and Surface Water

The study area ranges in slopes from about 5% to 20%. However, in specific portions of the study area there are locations with steep slopes greater than 20% such as the undeveloped areas in Coyote Springs and the area just north of Highway 333 and I-40 (Dead Man's Curve). The terracing of home sites is a dominant development feature in the study area. Even though the Carnuel area has developed by carving out home sites into the hillsides, there are very few roads that are paved. For the most part, the study area does not have significant drainage issues except in specific locations such as the creek crossing on Land Grant land in south Carnuel, including near the Santo Niño Church.

The single most important drainage feature of the study area is the Tijeras Creek, an intermittent stream. The creek is the major drainage outlet for the study area and in the second half of the last century has seen degradation of the native riparian habitat. The major impact to the Tijeras Creek is the runoff from Highway 333 and I-40. The Carnue Land Grant Board along with the Tijeras Safe Passage Coalition have both been active in working with the New Mexico Department of Transportation in mitigating highway drainage and the negative impacts associated with runoff flow. From the planning session (Jan. 7, 2006), it was clear that many Carnuel community members wanted to see the restoration of the Tijeras Creek in the Carnuel area. The Tijeras Arroyo and some tributaries are also floodplains mapped by the Federal Emergency Management Agency (FEMA). The eastern portion of Tijeras Canyon has been identified as an "Urban Area" by the United States Census. As a result, The Tijeras Canyon Arroyo must meet water quality requirements under the National Pollutant Discharge Elimination System (NPDES) Phase II regulations that are part of the National Clean Water Act.

Vegetation and Wildlife

The vegetation primarily consists of piñon, juniper, cactus, chamisa, and yucca sparsely located along the hillsides. Unlike other areas in the East Mountains, the native landscape along the hillsides has not been heavily impacted by human settlement. The riparian zone along the Tijeras Creek is dominated by cottonwood and willow. Over recent decades, the riparian area



Silva Historical Site. Photo by James M. Aranda

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has been negatively impacted by invasive species such as Russian olives, salt cedars, and elm trees. Other invasive plants such as nap weed and Russian thistle have also negatively impacted the native landscape.

Within the plan area is a corridor for wildlife crossing from the Sandia Wilderness to the Manzano Mountains. The area also serves as a water source for wildlife. The New Mexico Game and Fish Department and the Tijeras Safe Passage Coalition have been working together to develop solutions to reduce the number of bear and deer killed by automobiles along I-40 and Highway 333. Some recommendations developed by these entities include the redesign of culverts and overpasses to allow wildlife to move without restrictive barriers such as I-40. These groups have also recommended barriers such as walls and fences along the Interstate as a way to funnel wildlife into designated safe-passage areas (New Mexico Department of Transportation, Tijeras Safe Passage Feasibility Study, July 2005).

Over the years, the increased noise from highway traffic has become a nuisance. Since the plan area is located in a narrow canyon, the noise generated from high traffic volumes plagues the residents living nearest the highways with a constant “hum” of automobile movement. The community advocated mitigation of this noise pollution by the construction of a sound barrier on I-40. If planned in conjunction with improved wildlife crossings on the interstate, the barrier could serve to reduce noise and improve movement of wildlife through the canyon. The consideration for such a buffer would have to be examined by the New Mexico Department of Transportation, which has jurisdiction over I-40.

Cultural Resources

There are several cultural resource areas that have archeological and cultural significance for residents of the study area. The Silva Site which is located along Highway 333 directly west of the Santo Niño Church contains pueblo ruins and is believed to be the original site of the San Miguel Village. Among the other identified cultural resources are the existing cemetery of the Carnue Land Grant, the Santo Niño Church, and Santo Niño Road along the church down to the Tijeras Creek. Santo Niño Road and the land directly east of the church are used for the Feast Days of San Miguel on September 29th and Santo Niño on May 3rd. The sites and designated areas are important for ceremonial dances such as those performed by Matachines (dance in which participants dressed in regalia honor culturally significant dates or sites).

Another major cultural resource of the plan area is the Acequia Madre de Carnuel, the historic irrigation ditch in Carnuel. Following the destruction of most of the acequia system by the construction of I-40 in the 1970s, residents have worked throughout the years to restore the acequia. Currently, the acequia in the south Carnuel area is restored and in use. Restoration is being planned for the north side of I-40 in order to provide Carnue Land Grant with irrigated land along the Tijeras Creek.

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LAND USE

The following section presents existing land use conditions in the Tijeras Canyon/Carnuel Plan area.

Residential Uses

The primary land use in the study area is residential. The majority of the housing is single-family dwelling units. The existing zoning is comprised of A-1, A-2, M-H, and R-1. Some lots are smaller than the minimum required by the zoning designation and because they existed as such prior to the establishment of the Bernalillo County Zoning Ordinance, they have been “grandfathered” in. Most of Western Tijeras Canyon and some parcels directly north of Echo Canyon are zoned A-1. The A-1 designation allows for one single-family dwelling unit or a HUD zone code II manufactured home on a minimum lot size of one acre. A portion of the plan area is zoned A-2 which is located in the Monticello Neighborhood, Coyote Springs Master Plan area, and Coyote Springs Neighborhood (see Sub Area Map, Appendix B, p. 30). The A-2 zoning designation allows either a single-family dwelling unit, a HUD zone code II manufactured home, or mobile home on a minimum lot size of two acres. The land use conditions of the study area are unique in comparison to other communities in the East Mountains due to the overwhelming number of legally recognized non-conforming lots in the Carnuel area. In most of the Carnuel community and in Echo Canyon the zoning is designated as M-H. M-H zoning allows the placement of a mobile home at least 40 feet in length, HUD zone code II manufactured home, or a single-family dwelling unit on a minimum lot size of $\frac{3}{4}$ of an acre. A number of mobile homes are located in Carnuel on the south side of I-40 and north side of I-40 along Highway 333. There is also a group of R-1 zoned properties around Juan Road in Monticello. R-1 zoning allows a single-family dwelling unit or a HUD zone code II manufactured home on a minimum lot size of $\frac{3}{4}$ an acre. Lots in the developed Coyote Springs neighborhood begin at two acres in size. The majority of existing residential development in Monticello and Echo Canyon is on lots averaging $\frac{1}{2}$ acre in size, whereas in Carnuel, there are several lots that measure approximately $\frac{1}{4}$ acre in size.

Since the early 1990s, new development has taken place in the southwest portions of the plan area. Subdivisions have also been platted and developed on the western portion of the plan boundary referred to as Western Tijeras Canyon. The plan area also has a few large tracts of undeveloped land south of the Interstate I-40 frontage and Carnuel and in Western Tijeras Canyon. Small-scale commercial uses are sparsely spread along Historic Route 66. Today, the neighborhoods within the plan area continue to enjoy a rural atmosphere despite encroachment of urban development.

The majority of residential uses in Carnuel occurred before significant development regulations were created and applied to the planning area. This area is characterized by the older residential housing on lots that are well below the minimum lot size required by the zoning code. Many of the lots average approximately $\frac{1}{4}$ acre in size, a result of subdivisions by multiple generations of family members. Since the lot arrangements in this fashion were established before the development of a zoning code for Bernalillo County

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they are recognized as lots of record by the County. Some of these lots contain single-family dwelling units as well as additional structures.

Commercial Uses

A small number of businesses within the plan area are located along Highway 333 (Old Route 66). There currently exist approximately fifteen special use permits which allow the operation of commercial activities in the plan area. These include a horse stable, an auto repair shop, and several contractors' yards. In the community work sessions, the participants recognized the need to maintain Carnuel's rural character by limiting the extent and scale of commercial uses to be located only along Highway 333. Businesses proposed in the future should only be allowed to be located on a limited number of properties along the corridor and should be small in size.

The constraints faced by commercial uses and their location are the small size and physical aspects of parcels located along the highway corridor. Along this highway corridor, there are very few parcels that are larger than one acre in size limiting the potential for large scale use. In addition, most vacant tracts of land along the highway corridor have a steep slope and are not at grade with Highway 333.

Nevertheless, there are also a number of sites that are adequate for small-scale commercial uses. The Old Route 66 corridor should serve as the employment and commercial resource for the plan area and any non-residential uses will be focused in this area. Any future commercial uses should be small-scale and should address night lighting, drainage, and safe access. Existing commercial uses along Highway 333 should be allowed but any expansion in size or use should consider the area's character and must meet current Bernalillo County regulations.

Open Space/Recreation

The plan area is bordered to the north by the Cibola National Forest and to the south and east by the Manzanita Mountains, which are managed by the United States Forest Service (USFS) and Kirtland Air Force Base for the USFS Withdrawal area. In addition, there are tracts of designated Open Space owned by the State of New Mexico, and the City of Albuquerque.

One of the critical issues raised by work session participants is the need to connect existing open space lands with open space corridors for the purpose of developing wildlife corridors as well as to provide natural open space buffers. The Rabadi property (see Appendix B), sometimes referred to as the Silva Site, was recommended for acquisition but was not accomplished due to local residents' objections to City Open Space ownership of the property. The subsequent evaluation for purchase was made by the County Open Space Advisory Committee in 2003. In September 2006, the City of Albuquerque purchased the 63-acre Hawkwatch property adjacent to Tres Pistolas Open Space. It will be maintained as a wildlife habitat and open space. Participants also raised concerns about the development of the remaining large tracts of land, zoned A-1 and A-2.

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The natural beauty and accessible open space make the planning area a recreational destination. Currently, many people utilize the area's open space for off-trail biking, horseback riding, hiking, and ATV use. Many bicyclists also use Historic Route 66 through Carnuel to the Sandia Crest. Along with the recognition of open space uses on public land by participants in the planning process, another identified a need to restrict access along the Tres Pistolas Open Space Area (City of Albuquerque) to reduce negative impacts such as erosion and litter as well as to mitigate potential conflicts between local residents and recreational users.

Many participants of this planning process, recognize the need for increased coordination and participation by the various land owners for the purpose of improving open space corridors, scenic views, and improving overall environmental conditions. Due to increased development and physical barriers to wildlife passages along I-40, Tijeras Canyon has been recognized as a federal priority for improvement of wildlife passages. A major consideration for preserving and improving open space corridors is to create a less restrictive passage for wildlife. Work session participants recommended improving connections between open space areas, placing limits on development along critical passage areas, and pursuing the acquisition of land owned by Hawk Watch to improve open space conditions and recreation opportunities for residents as well as improve conditions for wildlife. Some of these goals are already being met through the implementation of the Bernalillo County Parks, Open Space, and Trails Master Plan and the East Mountain Trails and Bikeways Master Plan.

Cultural Uses

The Santo Niño Church and the old Carnuel cemetery located directly south of the Santo Niño Church and the areas surrounding Santo Niño Road are cultural resources that should be protected. This entire area is used for processions and ceremonial dances in observation of San Miguel Feast Day and the Santo Niño Feast Day. The new Cañon de Carnue Land Grant Cemetery was developed in 2005 and is located south of I-40 along the frontage road. In addition to the large cross located directly north of I-40 near exit 170, there are also various *descansos* (highway crosses) located throughout the community along roadways. Many of the crosses along the hillsides throughout the plan area delineate the historic markers of land grant common lands.

Carnuel Land Grant

In July 2004, the State of New Mexico granted most land grants the authority to establish zoning and land use regulations on communally held land¹. The Board of Directors of the Cañon de Carnue Land Grant has drafted and adopted the Cañon de Carnue Land Grant Comprehensive Plan and will implement the Comprehensive Plan through a land use planner. The Comprehensive Plan is intended to guide the land use process on common

¹State of New Mexico Statutes, Chapter 49-Land Grants, Article 1-General Provisions, Section 49-1-3 Board of trustees; management of grant; powers, J. determine zoning of the common lands of the land grant-merced pursuant to a comprehensive plan approved by the local government division of the department of finance and administration that considers the health, safety and general welfare of the residents. The department of finance and administration shall act as arbitrator for zoning conflicts between land grants-mercedes and neighboring municipalities and counties.

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land, including zoning, capital improvements, residential development and economic development. The New Mexico Local Government Division of the Department of Finance and Administration (DFA) is charged with reviewing and approving the Comprehensive Plan. The Department of Finance and Administration is also authorized to be involved in settlement of conflicts between land grants and neighboring municipalities and counties. The Land Grant Board's jurisdictional powers will only come into effect upon DFA's approval of their Comprehensive Plan. At that time, those properties owned by the Land Grant Board of Directors will no longer be governed by the Bernalillo County Zoning Ordinance.