5.1 AESTHETICS

Characterizing aesthetics and aesthetic impacts is highly subjective by nature. Aesthetics, as evaluated in this Section of the EIR, involves establishing the existing visual character including visual resources and scenic vistas unique to the City of San Bernardino, the SOI and the Arrowhead Springs area. Visual resources are determined by identifying existing landforms, natural features or urban characteristics; views of sensitive receptors (i.e., residential, schools, recreation areas, etc.); and existing light and glare (i.e., nighttime illumination). The aesthetic impacts of the proposed project are evaluated by determining the aesthetic compatibility of the proposed project with the surrounding area taking into consideration the visual qualities as well as the sensitivity of receptors to these features.

5.1.1 Environmental Setting

5.1.1.1 San Bernardino General Plan Update

Visual Character

The City of San Bernardino lies on a broad, gently sloping lowland that flanks the southwest margin of the San Bernardino Mountains. The lowland is underlain by alluvial sediments eroded from bedrock in the adjacent mountains and washed by rivers and creeks into the valley region where they have accumulated in layers of gravel, sand, silt and clay. This low lying valley is framed by the San Bernardino Mountains on the northeast and east, Blue Mountains and Box Springs Mountain abutting the Cities of Loma Linda and Redlands to the south, and the San Gabriel Mountains and the Jurupa Hills to the northwest and southwest, respectively. The Santa Ana River has a number of tributaries in the vicinity of San Bernardino that contribute flow to the main stem of the river including Lytle Creek, Cajon Creek, Warm Creek, East Creek and West Twin Creek (see Figure 3.1-2). The east branch of the California Aqueduct traverses the northwestern portion of the City. These watercourses provide valuable riparian habitat that supports flora and fauna within the San Bernardino Valley. Figures 5.1-1 and 5.1-2 show photographs of the City of San Bernardino that depict the visual character of the City.

The City's total planning area is 45,231 acres, or approximately 71 square miles. This includes 38,402 acres, or 60 square miles, of incorporated territory and 6,829 acres, or 11 square miles, of unincorporated lands within the City's SOI.

The City of San Bernardino is surrounded by Highland on the east, Redlands to the southeast, Loma Linda on the south, Colton to the southwest and Rialto on the west. These cities also lie in the valley region of San Bernardino and are comprised primarily of urban land uses. To the north, in the San Bernardino Mountain range, the City is bound by the San Bernardino National Forest. In addition the San Manuel Indian Reservation abuts the City's northeastern boundary.

Visual Resources

The San Bernardino Mountains comprise the City's northern boundary and provide the primary backdrop for residents of the City of San Bernardino (see Figure 5.1-1, top). Historically the City of San Bernardino has been utilized for a multitude of uses including, tourism centered around the regions unique geothermal activity, agricultural, military, industrial, commercial and residential. Today much of the valley has been urbanized and the City of San Bernardino has been built out from its original central historic district which is centered around the rail lines, because San Bernardino became the hub for the Santa Fe, the Union Pacific and the Southern Pacific railroads early on in the City's history. To the west of the central downtown district are the transportation industries that developed around the Santa Fe rail yard. Residential districts developed during the late nineteenth century spread from the downtown commercial district northward along E Street toward the Shandin Hills. Today, single-family residential, open space, flood control and education facilities

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City of San Bernardino Site Photos

View of the San Bernardino Mountains looking northeast from downtown San Bernardino.

View of the City of San Bernardino looking south toward Box Springs Mountain and Blue Mountain.

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City of San Bernardino Site Photos

Residential character within the foothills of the San Bernardino Mountains.

The historic California Theater located in the City's Downtown District.

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comprise the majority of the current land uses in the northern portions of the City, while industrial uses comprise the majority of land uses on the northwestern and southeastern potions of the City. Figure 5.1-1 (bottom) displays the viewshed of the City from the foothills looking south, toward Box Spring Mountain and Blue Mountain. In addition, the former Norton Air Force Base, now known as the San Bernardino International Airport and Trade Center, occupies the southeastern portion of the City.

The biological conditions in San Bernardino and throughout the region are highly modified from a pristine environment, although some areas still retain significant biological resource value. Upland areas support inland coastal sage scrub vegetation with a fauna typical of such habitats in southern California. Alluvial fans and floodplains of the valley floor support distinctive scrub vegetation containing an assortment of plants characteristic of both coastal sagebrush and chaparral communities. Deep canyons that support riparian and oak woodland plan communities provide a high quality habitat for a diverse assemblage of large and small wildlife species. Broad canyons and mountain slopes support mainly chaparral and woodland vegetation of a relatively undisturbed nature. In addition to its diverse natural communities, San Bernardino supports a wide variety of plant and animal species within its boundaries and SOI.

Landform

The San Bernardino Mountains, to the north of the City of San Bernardino, climb to an elevation of 4,237 feet above mean sea level (msl) at Arrowhead Peak near the Arrowhead Springs Specific Plan area. Just to the west of Arrowhead Peak and north of the Verdemont Heights Specific Plan area is Marshall Peak, which rises to an elevation of 4,003 feet above msl. The northwestern portions of the City are nestled in the foothills of the San Bernardino Mountains. The Shandin Hills, a small hilly portion of the City just south of the California State University San Bernardino, rise to an elevation of 1,717 feet above msl on Little Mountain. The majority of the developed portions of the City are located on the low lying valley floor at an elevation of approximately 1,000 feet above msl. The topography slowly rises toward the San Bernardino Mountains to the north.

Scenic Vistas and Corridors

Although much of the character of San Bernardino can be derived from its unique setting adjacent to the San Bernardino Mountains, unique geothermal resources, and central location in the San Bernardino Valley, the City of San Bernardino also obtains much of its character from its distinct neighborhoods. Each neighborhood has, or can have, its own unique character that is a source of pride for the residents. Neighborhood character is defined by many factors: what the neighborhood looks like, what it feels like, how well it is maintained, etc. But more importantly, it is an image in the minds of those who live and work there and in the perceptions of those who visit. These distinct neighborhoods provide the aesthetic foreground (closest viewing area) for the City of San Bernardino.

The Verdemont Heights area lies in the northwestern corner of the City of San Bernardino. This area encompasses 3,011 acres. This community is comprised primarily of low density residential uses, which are nestled in the north-south sloping foothills of the San Bernardino Mountains. Residents of this area currently enjoy views overlooking Cajon Creek Wash to the southeast and the Glen Helen Regional Park. Furthermore, this unique area is bordered on the north by the San Bernardino National Forest. Several seasonal creeks flow from the mountains in the north including Cable Creek, which is fed by the Meyers Canyon and Meecham Canyon creeks. Figure 5.1-2 (top) depicts residential uses within the foothills of the San Bernardino Mountains within the Verdemont Heights area.

In the northwestern portion of the City lies the California State University San Bernardino. The University area lies just south of the flood control basins of the Devil Canyon Flood Control Basin and the East Branch of the California Aqueduct, south of the Verdemont Heights area. Growth and development within this portion of the City has occurred independent of growth within the rest of the City due to the University.

The City's downtown area stretches from 9th Street on the north, to Mill Street and Rialto Avenue on the south, from Interstate 215 on the west, to Waterman Avenue on the east. The City's downtown area creates a unique aesthetic environment as it is comprised of many historic structures that give the downtown area a distinct atmosphere. Figure 5.1-2 (bottom) depicts the historic character of the City's downtown district.

Rivers, creeks and washes within the City of San Bernardino also add to the aesthetic middle ground of views around the City of San Bernardino. (Middle-ground would be the viewing area that is visible at a distance between 500 feet to one mile away.) In the southern portion of the City, the Santa Ana River meanders through the valley allowing for unique natural biological communities that depend on this year round water source and provides an aesthetically pleasing quality to the southern portions of the City. The Lytle Creek Wash and the Cajon Wash carve through the canyons before meandering through the northwestern portions of the City, where they ultimately join the Santa Ana River. In the northeastern portion of the City, Warm Creek, once a year-round stream fed by the Harlem Hot Springs and the Rabel Hot Springs, also creates a unique natural community. These natural communities are described in more detail in Section 5.3, *Biological Resources*. Furthermore, trails along these watercourses provide for viewing opportunities of these areas.

The background views of the City of San Bernardino are dominated by the San Bernardino Mountains that tower over the City in the north. (The background viewing area is described as the area that can be seen at a long distance, greater than one mile away and typically would include the horizon.) This valuable scenic resource provides much of the backdrop for the City's unique atmosphere. Although there are no designated State Scenic Highways located within the City of San Bernardino or SOI areas, SR-18, which travels through the San Bernardino Mountains past the Arrowhead Springs Planning Area is an eligible state scenic highway.

5.1.1.2 Arrowhead Springs

Visual Character

The exiting Arrowhead Springs resort is nestled in the San Bernardino Mountains, perched on a flat plateau area above the City of San Bernardino. The Arrowhead Springs Specific Plan area encompasses a larger area that is surrounded on the west, north and east by the San Bernardino National Forest, while urban areas of the City are located to the south. Being adjacent to the San Bernardino National Forest provides for vast areas of open space, and the opportunity to buffer the developed areas from view of urban areas in the City of San Bernardino. Figures 5.1-3 and 5.1-4 display images of the Arrowhead Springs area that depict the visual character of this old resort area.

The only residents of the existing Arrowhead Springs area are a few employees who occupy the bungalows that are part of the resort. The Arrowhead Springs area is primarily rural, although its primary use corresponds to its unique geological setting, as it is located in an area known for its geothermal resources. As a result, the Arrowhead Springs Specific Plan area has historically been utilized as a tourist destination for individuals seeking the luxuries associated with the mud baths, steam caves, hot springs, and the famous Esther Williams pool. In the past, tourism in the Arrowhead Springs area relied on the pristine natural environment and valuable geothermal resource that this area rests on. The resort is no longer open to the general public. These geothermal resources are inextricably linked to the hydrology and the tectonic activity beneath this area. Figure 5.1-3 (top) provides an aerial view of the Arrowhead Springs area and shows where existing uses are concentrated.

Arrowhead Springs is located within the West Twin Creek and East Twin Creek watersheds. There are three primary water courses that flow through the Arrowhead Springs property. The East Twin Creek, Strawberry Creek, and the West Twin Creek that flows through Waterman Canyon compose the major waterways (see Section 5.7, *Hydrology and Water Quality*).

Arrowhead Springs Site Photos

Aerial photograph of Arrowhead Springs.

View of the City of San Bernardino looking southwest from Arrowhead Springs.

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Arrowhead Springs Site Photos

View of Lake Vonette in the central portion of the Arrowhead Springs Specific Plan Area.

View of the historic Arrowhead Springs Hotel and signature landmark arrowhead above.

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Visual Resources

Due to its remote setting, diverse topography, and vast areas of open space, the Arrowhead Springs Specific Plan area offers many breathtaking views of the mountainous region and valley below. Figure 5.1-3 (bottom) shows the view of the City of San Bernardino from a point on the ridge below Lake Vonette in the central portion of Arrowhead Springs area. One of the most prominent visual features of Arrowhead Springs is the unique geologic landform in the shape of an arrowhead that lies on the slopes, off-site, above the historic hotel and gives the resort its name (see bottom photo in Figure 5.1-4). The large historic hotel itself dominates foreground views.

The natural biological conditions within the proposed Specific Plan area have been disturbed by the past construction and operation of existing and previous facilities and the infrastructure of roads and utilities. The grounds of the resort have been formally landscaped and contain mature trees and large lawns. The grounds continue to be well maintained. More recently both East and West Twin Creeks and nearby hillsides have been disturbed by the pipeline project of the MWD (see photos in Figure 5.1-5). Native plant communities consist of ruderal, mixed annual grassland and scrub, chaparral, riparian woodlands, and lower montane coniferous forest. In addition to its diverse natural communities, the Arrowhead Springs area supports a wide variety of bird, animal, and fish species within its boundaries. Some of the exotic species of the formally landscaped areas, such as palm trees have also naturalized in the some of the drainages and other locations.

Landform

The Arrowhead Springs area is located in the Transverse Range of the San Bernardino Mountains. The Arrowhead Springs Specific Plan area is comprised of diverse topography, rising from approximately 1500 feet in the southern portions to over 2400 feet above msl in the northernmost portion Specific Plan area. Arrowhead Peak, which rises above the Arrowhead Springs Specific Plan area, rises to an elevation of 4,237 feet above msl just north of the Specific Plan boundary.

Scenic Vistas and Corridors

The foreground of the Arrowhead Springs Specific Plan area is comprised of historic structures, such as the Arrowhead Springs Hotel, in addition to structures that correspond with the other existing uses of the Arrowhead Springs area. Within the developed portions of Arrowhead Springs, the primary middle ground viewshed is that of rolling hills. Figure 5.1-4 (top photo) shows the diverse landforms within the Arrowhead Springs Area, Lake Vonette is visible in this figure. Waterman Canyon runs through the western portion of the Arrowhead Springs area and a year round water course (West Twin Creek) follows the canyon's course. In some locations the creek channel is narrow and steep and in other locations spreads out in a small flood plain. West Twin Creek and Waterman Canyon is known for extreme rapid flood conditions that have from time to time scoured the creek bed leaving boulders scattered around. Some of this destructive character can be see in the lower photos in Figures 5.1-3 and 5.1-5. Coldwater Canyon with East Twin Creek carves through the eastern portion of the plan area along with Strawberry Creek. The two creeks join at the edge of the developed area as seen in the top photo in Figure 5.1-3 and continue southerly to the percolation basins at the southern boundary of the property. These creek channels are primarily steep and narrow through the site. The creeks and other drainages throughout the property contribute to the mountainous character of the site. The primary backdrop of the Arrowhead Springs Specific Plan area is the San Bernardino Mountains and the valley below. Since the Arrowhead Springs Specific Plan area is located in the mountainous portions of the City of San Bernardino, the higher elevations provide for some unobstructed views of the outstretching City below. These natural scenic resources provide the majority of the scenic quality of the Arrowhead Springs area. In addition, although no designated scenic highways pass through the Arrowhead Springs Specific Plan area, SR-18, the current entrance to Arrowhead Springs, is considered eligible for designation as a state scenic highway.

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Photos of Metropolitan Water District Project

East Portal above East Twin Creek

West portal area in Waterman Canyon

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Unique Scenic Resources

As mentioned above, rising above the historic Arrowhead Springs Hotel on Arrowhead Peak, is a unique geologic formation that resembles an arrowhead. This name was adopted circa 1875–1876. The arrowhead stands out above the resort and creates an unmistakable landmark; however, this landmark cannot be seen from many areas of the City.

In addition to this unique scenic resource, the Arrowhead Springs Specific Plan area is located atop an active geothermal area. Geothermal vents are often seen when driving local access roads. In addition, hot springs, steam caves, and mud baths provided major attractions for visitors to the Arrowhead Springs area when it was operational as a resort.

5.1.2 Thresholds of Significance

According to Appendix G of the CEQA Guidelines, a project would normally have a significant effect on the environment if the project would:

AE-1	Have a substantial adverse effect on a scenic vista.
AE-2	Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway.
AE-3	Substantially degrade the existing visual character or quality of the site and its surroundings.
AE-4	Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.

The Initial Study, included in Volume II, Appendix A, substantiates that impacts associated with threshold with the following threshold would be less than significant: AE-2. Therefore, this topic will not be discussed further in this EIR.

5.1.3 Environmental Impacts

The following impact analysis addresses thresholds of significance for which the Initial Study disclosed potentially significant impacts. The applicable thresholds are identified in parentheses after the impact statement.

5.1.3.1 San Bernardino General Plan Update

The City of San Bernardino General Plan Update guides development within the City. In addition to the underlying vision of the General Plan, the General Plan defines the important characteristics that would define San Bernardino in the future. The General Plan is therefore inextricably connected with the aesthetic character of the City as it would help define the aesthetic environment through community design and land use. Some of the key strategies related to aesthetics of the General Plan include: develop a distinct personality both at a community wide and a neighborhood level; Realize quality housing in safe and attractive neighborhoods; enhance cultural, recreational, and entertainment opportunities; and maintain a collective sense of community pride. As part of the General Plan's Community Design Element, goals and policies are established to provide for community-wide design features, district and neighborhood level design features and project level design features.

As part of the General Plan update, the City has created the University District Specific Plan. The vision of the Specific Plan for this area is to collaborate with the California State University San Bernardino to fully

integrate the campus with the surrounding community. The focus of this Plan is upon the aesthetic treatment of the public rights-of-way within the University District. To accomplish the goals of the University District Specific Plan, the plan focuses on creating a village at the intersection of University Parkway and Northpark Boulevard to anchor the entrance to the University. The plan also includes a coordinated system of signage, landscape features, entryways, and street furniture to provide a cohesive impact to tie the University District together.

GP IMPACT 5.1-1: BUILD-OUT OF THE CITY OF SAN BERNARDINO GENERAL PLAN WOULD ALTER THE VISUAL APPEARANCE OF THE CITY OF SAN BERNARDINO. [THRESHOLDS AE-1 AND AE-3]

Impact Analysis: Any amount of growth in the City of San Bernardino could potentially result in the development of undeveloped portions of the City, which are primarily concentrated in the north and northwest part of the City. However, implementation of the City's General Plan update would result in conservation of the existing open space areas near the City's northern boundary, near SR-18. The majority of planned land uses in this portion of the City are single-family residential. These land uses are proposed at densities of 1 dwelling unit per acre, at the base of the San Bernardino Mountains, to 4.5 dwelling units per acre closer to the existing urban areas. Land use change as a result of new development would alter the visual appearance from natural open space to urban land uses. However, development within the low lying areas of the valley and foothills adjacent to the San Bernardino Mountain would not impact scenic views of the City provided by this backdrop as the peaks of these mountains rise to over 4,000 feet above msl.

The San Bernardino General Plan also focuses on revitalization of the City's urban areas through redevelopment. These redevelopment areas include the Central City Projects, the Central City North, the Central City West, State College, Southeast Industrial Park, Northwest, Tri-City, South Valley, Uptown, and the Mt. Vernon Corridor. Concentrating redevelopment efforts through revitalization of underutilized areas within the City would result in an improvement in the existing aesthetic quality of these neighborhoods by reinvigorating business investment in the community.

University District Specific Plan

Due to the existing commitments and existing developments, there is little ability to make significant land use changes within the University District. Instead, the focus of this Plan is upon the aesthetic treatment of the public rights-of-way within the University District. As such, the University District Specific Plan seeks to improve the aesthetic character of the University district through interconnectivity and land use linkages by signage, lighting and other public right-of-way design treatments.

GP IMPACT 5.1-2: BUILD-OUT OF THE SAN BERNARDINO GENERAL PLAN WOULD GENERATE ADDITIONAL LIGHT AND GLARE WITHIN THE CITY. [THRESHOLD AE-4]

Impact Analysis: Development within the City of San Bernardino, as it slowly creeps northward into the foothills of the San Bernardino Mountains, would result in an additional source of light or glare on area residents and within undeveloped portions of the City. Sensitive plant and animal communities, specifically in the foothills and adjacent to watercourses, in the City are especially affected by addition of new light sources brought on by new development.

Relevant Policies and Programs

The following City of San Bernardino policies and programs related to aesthetics include:

Land Use Element

Policy 2.1.1: Actively enforce development standards, design guidelines, and policies to preserve and enhance the character of San Bernardino's neighborhoods.

Policy 2.1.2: Require that new development with potentially adverse impacts on existing neighborhoods or residents such as noise, traffic, emissions, and storm water runoff, be located and designed so that quality of life and safety in existing neighborhoods are preserved.

Policy 2.1.3: Encourage future development to provide public spaces that foster social interaction.

Policy 2.1.4: Provide assistance in the form of grants, loans, home improvement efforts, coordinated code and law enforcement, public right-of-way maintenance and enhancement, and trash collection to help improve San Bernardino's residential neighborhoods.

Policy 2.1.5: Ensure compliance with maintenance and development standards through the rigorous enforcement of Code Enforcement and Safety standards.

Policy 2.2.1: Ensure compatibility between land uses and quality design through adherence to the standards and regulations in the Development Code and policies and guidelines in the Community Design Element.

Policy 2.2.2: Require new uses to provide mitigation or buffers between existing uses where potential adverse impacts could occur, including, as appropriate, decorative walls, landscape setbacks, restricted vehicular access, enclosure of parking structures to prevent sound transmission, and control of lighting and ambient illumination.

Policy 2.2.3: Sensitively integrate regionally beneficial land uses such as transportation corridors, flood control systems, utility corridors, and recreational corridors into the community.

Policy 2.2.4: Hillside development and development adjacent to natural areas shall be designed and landscaped to preserve natural features and habitat and protect structures from the threats from natural disasters, such as wildfires and floods.

Policy 2.2.5: Establish and maintain an ongoing liaison with Caltrans, the railroads, and other agencies to help minimize impacts and improve aesthetics of their facilities and operations; including possible noise walls, berms, limitation on hours and types of operations, landscaped setbacks and decorative walls along its periphery.

Policy 2.2.6: Establish and maintain an ongoing liaison with the County of San Bernardino to conform development projects within the City's sphere of influence to the City's General Plan.

Policy 2.2.7: Control the development of industrial and similar uses that use, store, produce or transport toxics, air emissions, and other pollutants.

Policy 2.2.10: The protection of the quality of life shall take precedence during the review of new projects. Accordingly, the City shall utilize its discretion to deny or require mitigation of projects that result in impacts that outweigh benefits to the public.

Policy 2.3.1: Commercial centers, open spaces, educational facilities, and recreational facilities should be linked to residential neighborhoods.

Policy 2.3.2: Promote development that is compact, pedestrian-friendly, and served by a variety of transportation options along major corridors and in key activity areas.

Policy 2.3.3: Entries into the City and distinct neighborhoods should be well defined or highlighted to help define boundaries and act as landmarks.

Policy 2.3.4: Develop a cohesive theme for the entire City as well as sub-themes for neighborhoods to provide identity, help create a sense of community, and add to the City's personality.

Policy 2.3.5: Capitalize on cultural events, such as the Route 66 Rendezvous, to help market and build a distinct identity for the City.

Policy 2.3.6: Circulation system improvements shall continue to be pursued that facilitate connectivity across freeway and rail corridors.

Policy 2.3.7: Improvements shall be made to transportation corridors that promote physical connectivity and reflect consistently high aesthetic values.

Policy 2.4.1: Quality infill development shall be accorded a high priority in the commitment of City resources and available funding.

Policy 2.4.2: Continue to provide special incentives and improvement programs to revitalize deteriorated housing stock, residential neighborhoods, major business corridors, and employment centers.

Policy 2.4.3: Where necessary to stimulate the desired mix and intensity of development, land use flexibility and customized site development standards shall be achieved through various master-planning devices such as specific plans, planned development zoning, and creative site planning.

Policy 2.5.1: Use code enforcement in coordination with all relevant City departments to reverse deterioration and achieve acceptable levels of development quality. These efforts should focus on structural maintenance and rehabilitation, debris and weed removal, property maintenance, and safety.

Policy 2.5.2: Continue collaboration with the San Manuel Indians and County of San Bernardino to achieve acceptable development quality within San Bernardino's sphere of influence.

Policy 2.5.4: Require that all new structures achieve a high level of architectural design and provide a careful attention to detail.

Policy 2.5.5: Provide programs that educate residential and commercial property owners and tenants regarding methods for the maintenance and upkeep of their property.

Policy 2.5.6: Require that new developments be designed to complement and not devalue the physical characteristics of the surrounding environment, including consideration of:

- The site's natural topography and vegetation;
- Surrounding exemplary architectural design styles;
- Linkages to pedestrian, bicycle, and equestrian paths;
- The use of consistent fencing and signage;
- The provision of interconnecting greenbelts and community amenities, such as clubhouses, health clubs, tennis courts, and swimming pools;
- The use of building materials, colors, and forms that contribute to a "neighborhood" character;
- The use of extensive site landscaping;
- The use of consistent and well designed street signage, building signage, and entry monumentation;
- A variation in the setbacks of structures;
- The inclusion of extensive landscape throughout the site and along street frontages;

- The articulation of building facades to provide interest and variation by the use of offset planes and cubic volumes, building details, balconies, arcades, or recessed or projecting windows, and other techniques which avoid "box"-like structures;
- The integration of exterior stairways into the architectural design;
- The screening of rooftop mechanical equipment;
- The use of a consistent design through the use of unifying architectural design elements, signage, lighting, and pedestrian areas;
- The provision of art and other visual amenities;
- The inclusion of awnings, overhangs, arcades, and other architectural elements to provide protection from sun, rain, and wind; and
- The location of parking at the rear, above or below the ground floor of non-residential buildings to enhance pedestrian connectivity.

Policy 2.6.1: Hillside development and development adjacent to natural areas shall be designed and sited to maintain the character of the City's significant open spaces and historic and cultural landmarks.

Policy 2.6.2: Balance the preservation of plant and wildlife habitats with the need for new development through site plan review and enforcement of the California Environmental Quality Act (CEQA).

Policy 2.6.3: Capitalize on the recreational and environmental resources offered by the Santa Ana River and Cajon Wash by requiring the dedication and development of pedestrian and greenbelt linkages.

Policy 2.7.3: Continue to explore opportunities, such as water themed uses, to financially capitalize on the City's water resources to enhance the City's image.

Policy 2.10.3: Ensure that residents of San Bernardino have the opportunity to provide input to the determination of future land use development that may significantly affect the character and quality of life.

Community Design Element

Policy 5.1.1: Provide improvements along principal streets at the City boundary that clearly identify major entries to the City. Such improvements may include signage, landscaping, vertical pylons, and/or other distinctive treatments.

Policy 5.1.2: Designate and provide monumentation for important primary and secondary entry points into the City, especially at the following locations:

- Primary Entryways: Waterman at Hospitality Lane; State Route 18 at National Forest boundary; State Route 330 (City Creek Road) at Highland Avenue; I-215 Freeway at Shandin Hills; I-215 Freeway at Cable Wash; and I-215 Freeway at Inland Center Drive off-ramps

- Secondary Entryways: 2nd Street at I-215 Freeway; Highland at Lytle Creek Wash (east side); Baseline at Lytle Creek Wash (east side); Santa Fe Railroad Passenger Terminal; 5th Street at Nunez Park; 5th Street at Waterman; Freeway off-ramps

Policy 5.1.3: Prepare an entry signage program that would denote Primary and Secondary entries to the City through informational lettering, the City logo, photo-silkscreens, banners, and/or graphics.

Policy 5.1.4: Locate major accent trees at entry locations and intersections. Species should be of a "grand" scale to differentiate these key locations (such as palms, canary island pines, or poplars).

Policy. 5.1.5: Develop a Citywide program of public art to provide unifying themes for gateways.

Policy 5.2.1: Establish and implement a comprehensive citywide streetscape and landscape program for those corridors identified on General Plan Figure CD-1 and includes the following right-of-way improvements:

- Street trees
- Street lighting
- Streetscape elements (sidewalk/crosswalk paving, street furniture)
- Public signage

Policy 5.2.2: Require that landscaping be adequately maintained and replaced if removed due to damage or health.

Policy 5.2.3: Require that all new street landscape incorporate an irrigation system to provide proper watering.

Policy 5.2.4: Screen public facilities and above-ground infrastructure support structures and equipment, such as electrical substations and water wells, through sensitive site design, appropriately scaled landscaping, undergrounding of utilities, and other methods of screening (e.g., cell tower stealthing).

Policy 5.2.5: Use landscaping and facade articulation to break up long stretches of walls associated with residential development along major corridors.

Ensure implementation of sign regulations, which address issues of scale, type, design, materials, placement, compatibility, and maintenance.

Policy 5.2.7: Provide for the use of well-designed and placed banners for City events, holidays, and other special occasions.

Policy 5.2.8: Provide for the use of kiosks or other street furniture along the City's streets.

Policy 5.2.9: Along major corridors, continue to pay special attention to design features that include screening, berms, fencing, and landscaping for outdoor storage and handling areas.)

Policy 5.3.1: Utilizing the Neighborhood Associations to develop a program to identify unique design features and create design themes for distinct areas of the City.

Policy 5.3.2: Distinct neighborhood identities should be achieved by applying streetscape and landscape design, entry treatments, and architectural detailing standards, which are tailored to each particular area and also incorporate citywide design features.

Policy 5.3.3: A well-integrated network of bike and pedestrian paths should connect residential areas to schools, parks, and shopping centers.

Policy 5.3.4: Enhance and encourage neighborhood or street identity with theme landscaping or trees, entry statements, enhanced school or community facility identification, and a unified range of architectural detailing.

Policy 5.3.5: Create entry improvements to help identify distinct districts; these elements could consist of monument pylons, freestanding banners on poles, banners hung from existing light or marbelite standards (subject to agreement with the utility company) or graphic elements hung from or attached to private buildings.

Policy 5.3.6: Provide for streetscape improvements, landscape and/or signage that uniquely identify architecturally or historically significant residential neighborhoods.

Policy 5.3.7: Establish a program to select and install streetlights that reinforce the character of the particular district.

Policy 5.4.1: Aggressively apply and enforce citywide landscape and development standards in new and revitalized development throughout the City.

Policy 5.4.3: Ensure that the design of all public facilities fits well into their surroundings and incorporates symbolic references to the City, including its past and/or present, as appropriate.

Policy 5.5.1: Require new and in-fill development to be of compatible scale and massing as existing development yet allow the flexibility to accommodate unique architecture, colors, and materials in individual projects.

Policy 5.5.2: Improve the pedestrian atmosphere of the street by orienting new homes to the street with attractive front porches, highly visible street facades, and garages located in the rear of the property.

Policy 5.5.3: Maintain, improve and/or develop parkways with canopy street trees, providing shade, beauty and a unifying identity to residential streets.

Policy 5.5.4: Setback garages from the street and minimize street frontage devoted to driveways and vehicular access.

Policy 5.5.5: Provide continuous sidewalks and links to nearby community facilities and retail centers.

Policy 5.5.6: Ensure a variety of architectural styles, massing, floor plans, façade treatment, and elevations to create visual interest.

Policy 5.5.7: In residential tract developments, a diversity of floor plans, garage orientation, setbacks, styles, building materials, color and rooflines shall be preferred over more uniform design patterns.

Policy 5.6.1: Reduce the visual impact of large-scale, multi-family buildings by requiring articulated entry features, such as attractive porches and detailed facade treatments, which create visual interest and give each unit more personalized design.

Policy 5.6.2: Discourage visually monotonous, multi-family residences by incorporating different architectural styles, a variety of rooflines, wall articulation, balconies, window treatments, and varied colors and building materials on all elevations.

Policy 5.6.3: Reduce the visual impact of parking areas by utilizing interior courtyard garages, parking structures, subterranean lots, or tuck-under, alley-loaded designs.

Policy 5.6.4: Provide usable common open space amenities. Common open space should be centrally located and contain amenities such as seating, shade and play equipment. Private open space may include courtyards, balconies, patios, terraces and enclosed play areas.

Policy 5.6.5: Provide convenient pedestrian access from multi-family development to nearby commercial centers, schools, and transit stops.

Policy 5.7.1: Ensure the provision of people-gathering places and street level amenities, such as mini-plazas, courtyards, benches, movable seating, shade, trash receptacles, water fountains awnings large storefront windows, arcades, small sitting areas, and accent landscaping.

Policy 5.7.2: Orient buildings toward major thoroughfares, sidewalks, and public spaces so that parking is convenient but not visually dominating.

Policy 5.7.3: Maintain architectural interest and variety through varied rooflines, building setbacks, and detailed façade treatments and maintain a strong sense of project identity through similarities in façade organization, signage, landscaping, material use, colors, and roof shapes.

Policy 5.7.4: The size, colors, type, materials, and design of signs shall be related to the scale of the building or development and its relation to the street.

Policy 5.7.5: Parking areas shall provide, where practical, pedestrian pathways for safe access to shopping and activity areas that are defined by landscaped planters and incorporated into the parking lot design.

Policy 5.7.6: Encourage architectural detailing, which includes richly articulated surfaces and varied facade treatment, rather than plain or blank walls.

Policy 5.7.7: Minimize the visual impact of surface parking lots by locating them behind buildings, away from the street or through perimeter and interior landscaping, berming, and small-scale fencing.

Policy 5.7.8: Design public plazas and spaces that are both comfortable and convenient. They should be well defined by surrounding buildings, located near the street for visual contact and convenience, contain abundant seating opportunities, and incorporate amenities such as distinctive focal points, public art, ample shade, and eating and entertainment possibilities.

Policy 5.7.9: Ensure that the scale and massing of office, commercial, and industrial uses are sensitive to the context of surrounding residential development.

Policy 5.7.10: Lighting should provide for safety and to highlight features of center but not shine directly onto neighboring properties or into the eyes of motorists.

Policy 5.7.11: Loading bays should be screened by walls and landscaping and oriented away from major streets and entries.

Policy 5.7.12: Install new streetlights in commercial districts that are pedestrian-oriented, attractively designed, compatible in design with other street furniture, and provide adequate visibility and security.

5.1.3.2 Arrowhead Springs Specific Plan

The Arrowhead Springs Specific Plan would increase the intensity of land uses in an area which is largely comprised of open space. Implementation of the Arrowhead Springs Specific Plan would result in a build-out of 1,350 residential units and 1,044,646 square feet of commercial and office uses. These additional commercial and residential uses would be located around the existing developed areas in the central portion of the plan area. The central portion of the planning area is the historic Arrowhead Springs Hotel. With implementation of the Arrowhead Spring Specific Plan, the hotel would be restored and an annex to the existing hotel would be built. A new earth sheltered conference center would extend to the south of the hotel. Other hotel/report amenities would be restored to take advantage of the unique geothermal resource found within the Arrowhead Springs area. Under the Arrowhead Springs Specific Plan, a new 300-room hotel is also proposed. On the western edge of the property near State SR-18, the Arrowhead Springs Specific Plan proposes a 199-acre public golf course along the route of Waterman Canyon, which would force a realignment of West Twin Creek.

The plan also proposes a 'Village Walk' Commercial Center, which would wrap around the southern portion an expanded Lake Vonette. The Village Walk is proposed for 200,000 square-feet of shops, restaurants, cafes, and pedestrian promenades. New botanical gardens would be built on the northern side of Lake Vonette.

Due to the intensity of the uses proposed, the Arrowhead Springs Specific Plan also includes infrastructure improvements including, new or improved roads, bridges, water distribution and treatment facilities, wastewater collection improvements and a new wastewater treatment facility with recycled water capabilities to accommodate the irrigation requirements of the golf course.

Some of the reservoirs for drinking water would be located outside the conceptual grading footprint identified in Figure 3.3-6, in Section 3.3, *Project Description*, and would require a small access road for maintenance. However, the reservoirs would be located and designed to avoid inundation of nearby neighborhoods in the event of failure and shielded from views of residential areas where practical. Construction of four water reservoirs would be required to obtain adequate water pressure and water supply for the proposed development. The northernmost water-tower would be located at the northernmost boundary of the Arrowhead Springs Specific Plan site to supply Zone VIII and VII. This 0.5 million gallon water tower is proposed at an elevation of approximately 2,810 feet and would be visible from SR-18, approximately 1,000 feet away, across from the golf course area. Another water reservoir is proposed adjacent to the golf course area to the south of the northernmost water reservoir and would supply Zone V and VI. This water tank would have a capacity of 0.75 million gallons and be located at an elevation of 2,450 feet. Another water reservoir would be located to the north of the development area in the central portion of the Arrowhead Springs development. This water reservoir would have a capacity of 3.2 million gallons and would be the largest of the four reservoirs. This reservoir would be located at an elevation of 2,130 feet to supply water to Zone III and IV. The fourth water reservoir would be located to the south of the large reservoir to supply Zone I and II. This reservoir would be located at an elevation of 1,790 feet and have a capacity of 0.75 million gallons.

In order to accomplish the infrastructure needs and development of the land uses proposed for the Arrowhead Springs Specific Plan, significant quantities of cut and fill would be required for construction of level pads, as the Arrowhead Springs Specific Plan area is located in a topographically diverse location. The conceptual grading plan (see Figure 3.3-6 in Section 3.3, *Project Description*) identifies that development of the plan would require approximately 7 million cubic yards of earth to be cut and then used as fill elsewhere on-site for development proposed under the plan. An additional one million cubic yards of earth may need to be removed to remediate potential landslide areas throughout the property.

AHS IMPACT 5.1-1: BUILD-OUT OF THE ARROWHEAD SPRINGS SPECIFIC PLAN WOULD ALTER THE VISUAL APPEARANCE OF THE ARROWHEAD SPRINGS AREA. [THRESHOLDS AE-1 AND AE-3]

Impact Analysis: The Arrowhead Springs Specific Plan area is a combination of scenic natural environment and resort development that was founded on the natural resources provided by the San Bernardino Mountains, including the mountain streams and geothermal activity, such as natural hot springs. The existing resort development is nestled in the higher elevations of the San Bernardino Mountains. Build-out of the Arrowhead Springs Specific Plan would be primarily centered around the existing development, which now occupies approximately 200 acres of land, while preserving or enhancing the remaining natural features. Not including the golf course, the existing development footprint would be expanded by little over 100 acres but that area would also include over 21 acres of parks. However, build-out of the Arrowhead Springs Specific Plan would result in modification of a portion the existing natural environment. Specifically, the proposed commercial development area around Lake Vonette, the new residential development south of Lake Vonette and the new residential development north or the historic hotel would visibly alter the existing landscape. Cut and fill required for slope stabilization, road construction and development sites would result in landform modification of the existing topography. Additionally, construction of the golf course, which would require major realignment of West Twin Creek, would alter the character of the existing creek. It should be noted however, that the character of both West and East Twin Creeks in specific locations has already been altered by the construction of the MWD pipeline project.

Views of the development from outside the area would be mostly obscured because of the placement of the development within the canyons and valleys of the San Bernardino Mountains and in areas high above and distant from the developed areas of San Bernardino. However, the southern portion of the Arrowhead Springs development areas would be visible from existing residents within a small portion of northern San Bernardino, adjacent to the Arrowhead Springs area and to the west of SR-18, and from existing residences to the southeast near the proposed Village Parkway. In addition, the water reservoirs necessary for the water supply of the Arrowhead Springs development may be visible from many locations within the Arrowhead Springs development and along SR-18 because of placement out side the grading footprint. The reservoirs outside the grading footprint the access roads to reach them would detract from the views of the pristine natural environment. The majority of the reservoirs would not be clearly visible to travelers on SR-18 or residents outside the Arrowhead Springs development.

Although implementation of the Arrowhead Springs Specific Plan would alter the topography and character of approximately 306 acres of land outside the existing development footprint of 200 acres, the remaining 1,400 acres would stay in its current natural condition. The Specific Plan contains extensive design guidelines and development standards that require sensitivity to natural landforms and emphasize preservation of views and the natural environment where possible and all developed areas have requirements for landscaping that would restore areas that have been disturbed and obscure views of developed areas. West Twin Creek would experience the greatest difference in character, however the golf course development would retain the feeling of openness and realignment of the creek would avoid the scouring of valley during flooding that has periodically removed all vegetation. Restoration of riparian habitat would occur where necessary with some assurance that flooding events would not denude the area providing for long term enhancement of the area. The golf course would also be planted with trees which would eventually obscure views of the golf course from passers-by on SR-18.

AHS IMPACT 5.1-2: BUILD-OUT OF THE ARROWHEAD SPRINGS SPECIFIC PLAN WOULD GENERATE ADDITIONAL LIGHT AND GLARE IN A PREVIOUSLY UNDEVELOPED AREA. [THRESHOLD AE-4]

Impact Analysis: Implementation of Arrowhead Springs Specific Plan would result in additional sources of light and glare with greater intensity in the areas where development currently exists adjacent to open space. Since very few residences actually live near the Arrowhead Springs area and development would be shielded by the terrain and landscaping, light and glare from the future development would affect a minimal number of people or other sensitive users.

Relevant Polices and Development Standards

The policies and development standards set forth for the Arrowhead Springs Specific Plan for aesthetics include the following:

Hillside Development

- To minimize the effects of grading and ensure that the natural character of hillside areas is retained;
- To protect and balance the rights of property owners with the desire of neighbors to preserve the most visually significant slope banks and ridgelines in their natural state by providing for developing hillsides at low densities;
- To encourage variety in housing types, padding techniques, grading techniques, lot sizes, site design, density, arrangement, and spacing of homes and developments;
- To encourage innovative architectural, landscaping, circulation, and site design;

- To discourage mass grading of large pads and excessive terracing;
- To provide for safe circulation of vehicular and pedestrian traffic to and within hillside areas, and to provide adequate access for emergency vehicles necessary to serve hillside areas;
- To take into account unstable slopes, or slopes subject to erosion and deterioration, in order to protect human lives and property;
- To encourage design and building practices to assure maximum safety from wild fire hazard;
- To preserve visually significant rock outcroppings, native plant materials, and natural hydrology;
- To protect and balance the rights of hillside property owners with the public benefits of reducing the visual effects of grading and minimizing the apparent bulk of structures on ridges and hillsides; and
- To balance the desire of neighbors who may object to changes in a hill's natural shape with the rights of property owners desiring to place upscale homes at low densities on slopes and ridges.

Design

- Dwelling units and structures shall be compatible with the natural surroundings of the area and shall not dominate the natural environment.
- Exterior finishes of dwelling units and structures should blend in with the natural surroundings by using earth tone colors and avoiding reflective materials or finishes.
- Site design should utilize varying setbacks, building heights, innovative building techniques, and building and wall forms which serve to blend buildings into the terrain.
- Dwelling units and structures shall be sited in a manner that will:
    - Retain outward views from each unit;
    - Preserve or enhance vistas, particularly those seen from public places;
    - Preserve visually significant rock outcroppings, natural hydrology, native plant materials, and areas of visual or historical significance.
- The highest point of any structure shall not exceed 25-feet above a natural or graded ridgeline. A ridgeline is a long, narrow, conspicuous elevation which is visible north of Highland Avenue, from a freeway, arterial, or collector street, which forms part of the skyline or is seen as a distant edge against a backdrop of land at least 300 feet horizontally behind it. The height of a ridgeline shall not be reduced more than necessary to construct roadways and structures but in any event more than 50-feet. Acceptable techniques to reduce the impact on ridgelines include the following:
    - Use the natural ridgeline as a backdrop for structures;
    - Use landscape plant materials as a backdrop; and
    - Use the structure to maximize concealment of cut slopes.
- The Arrowhead Springs Specific Plan includes Development Requirements for residential, business, mixed residential and business, and open space required for all new developments in the Arrowhead Springs area. In addition general development standards, consistent with Section 19.20.030 of the City of San Bernardino Municipal Code.

- Parking design standards within the Historic Hotel and Spa District and Village are to be determined administratively, in consultation with the Development Services Department, subject to the approval of the Development Services Director. If agreement cannot be reached administratively, then a parking variance application shall be required.

5.1.4 Existing Regulations and Standard Conditions

- The City of San Bernardino Municipal Code, Section 19.04, Residential Districts, contains applicable regulations pertaining to commercial zone and industrial district development standards within the City of San Bernardino.

- The City of San Bernardino Municipal Code, Section 19.06, Commercial Districts, contains applicable regulations pertaining to residential development standards within the City of San Bernardino.

- The City of San Bernardino Municipal Code, Section 19.28, Landscaping Standards, includes general regulations, screening requirements, setback and parkway treatment standards, and landscape design guidelines for new developments in the City of San Bernardino. These landscaping regulations are intended to enhance the aesthetic appearance of development in all areas of the City by providing standards relating to quality, quantity and functional aspects of landscaping and landscape screening; increase compatibility between residential and abutting commercial and industrial land uses; reduce the heat and glare generated by development; protect public health, safety, and welfare by minimizing the impact of all forms of physical and visual pollution, controlling soil erosion, screening incompatible land uses, preserving the integrity of neighborhoods, and enhancing pedestrian and vehicular traffic and safety; and establish a water conservation plan to reduce water consumption in the landscape environment by using drought tolerant principals.

- The City of San Bernardino Municipal Code, Section 19.20, Property Development Standards, to ensure that new or modified uses and development will produce an urban environment of stable, desirable character which is harmonious with the existing and future development, consistent with the General Plan. The following general standards are discussed in detail in Section 19.20.030 of the City of San Bernardino Municipal Code, which pertain to aesthetic quality and apply to new development:

    - Access
    - Additional Height Restrictions
    - Antennae, Satellite Dish, and Telecommunications Facilities
    - Design Considerations
    - Dust and Dirt
    - Environmental Resources/Constraints
    - Exterior Building Walls
    - Fences and Walls
    - Glare
    - Height Determination (Buildings and Structures)
    - Lighting
    - Projections into Setbacks
    - Public Street Improvements
    - Refuse Storage/Disposal
    - Screening
    - Solar Energy
    - Signs, Off-Street Parking, Off-Street Loading and Landscaping
    - Storage

- Pursuant to Section 19.20.030 of the City of San Bernardino Municipal Code, no glare incidental to any use shall be visible beyond the boundary line of the parcel.
- Pursuant to Section 19.20.030, exterior lighting shall be energy-efficient and shielded or recessed so that direct glare and reflections are contained within the boundaries of the parcel, and shall be directed downward and away from adjoining properties and public rights-of-way. No lighting shall blink, flash, or be of unusually high intensity or brightness. All lighting fixtures shall be appropriate in scale, intensity, and height to the use it is serving. Security lighting shall be provided at all entrances/exits.
- The City of San Bernardino Municipal Code, Section 19.22, Sign Regulations, establishes sign regulations that are intended to protect the general public health, safety, welfare, and aesthetics of the community; implement community design standards, consistent with the General Plan; promote the Community's appearance by regulating the design, character, location, type, quality of materials, scale, color, illumination, and maintenance of signs; limit the use of signs which provide direction and aid orientation for businesses and activities; promote signs that identify uses and premises without confusion; and reduce possible traffic and safety hazards through good signage. No sign, including a copy change, or temporary sign, unless exempted by this Chapter, shall be constructed, displayed or altered without a sign permit or sign program approved by the City. The Director shall review all signs unless otherwise stated. A sign permit for a sign program may be submitted for all new commercial, office, and industrial centers consisting of three or more tenant spaces. The program may be filed with the project application to construct the center, and can be processed concurrently with the project application. The purpose of the program shall be to integrate signs with building and landscaping design to form a unified architectural statement.
- The City of San Bernardino Municipal Code, Section 19.24, Parking Standards and Design, contains applicable regulations pertaining to parking standards and design within the City of San Bernardino.

5.1.5 Level of Significance Before Mitigation

5.1.5.1 San Bernardino General Plan Update

Upon implementation of policies, regulatory requirements, and standard conditions of approval, the following impacts would be less than significant:

GP Impact 5.1-1 Build-out of the City of San Bernardino General Plan would have the potential to alter the visual appearance and character of many areas including the conversion of open space to urban land uses. In addition, redevelopment in the City, including the University District, would also result in alteration of land uses, thus altering the visual appearance of the urban areas. However, new developments are subject to a development plan review process and subsequent CEQA review overseen by the City, to ensure preservation of the aesthetic quality of the natural and manmade environment within the City of San Bernardino.

GP Impact 5.1-2 Build-out in accordance with the City of San Bernardino General Plan would result in new sources of light and glare on existing residences and in areas where none exists. However, Section 19.20.030 of the San Bernardino Municipal Code regulates light and glare impacts from new developments.

5.1.5.2 Arrowhead Springs Specific Plan

Upon implementation of regulatory requirements, standard conditions of approval including the development standards of the Specific Plan the following impacts would be less than significant:

AHS Impact 5.1-1 Land use change as a result of new development in accordance with the Arrowhead Springs Specific Plan would alter the visual appearance of an additional 306 acres of the 1,916-acre property, for a total of 506 acres of development. All development plans for Arrowhead are subject to a development plan review process overseen by the City, that would ensure compliance with the development standards put forth in the Specific Plan that emphasize preservation of the natural environment and sensitivity to existing topography. Additionally, the developed areas would not be clearly visible to the majority of residents of San Bernardino or nearby areas.

AHS Impact 5.1-2 Build-out of the Arrowhead Springs Specific Plan would result in the addition of new sources of light and glare and the intensification of light and glare in and around the existing developed areas. The developed areas would be too distant from existing residential areas to adversely effect views of the area.

5.1.6 Mitigation Measures

No significant impacts have been identified for either the San Bernardino General Plan update or the Arrowhead Springs Specific Plan and no mitigation measures are required.

5.1.7 Level of Significance After Mitigation

Impacts identified have been determined to be less than significant with application of the existing conditions and regulations in addition adherence to the goals and policies contained within the General Plan and the Arrowhead Springs Specific Plan. Therefore, no significant unavoidable adverse impacts relating aesthetics have been identified.

5.2 AIR QUALITY

The analysis in this section is based in part on the following technical reports(s):

- *General Plan Update 2004, Circulation Impact and Mitigation Measures*, Transtech Engineers, December 22, 2004.
- *Arrowhead Springs Specific Plan, Traffic Impact Analysis and Mitigation Measures.* Transtech Engineers, December 29, 2004.

A complete copy of these studies is included in the Technical Appendices to this Draft EIR (Volume II, Appendix G, and Volume III, Appendix H)

5.2.1 Environmental Setting

5.2.1.1 San Bernardino General Plan

Meteorologic Conditions

The City of San Bernardino and SOI areas lie in the South Coast Air Basin (SoCAB or Basin) which includes all of Orange County as well as the non-desert portions of Los Angeles, Riverside, and San Bernardino Counties. The Basin is located in a coastal plain with connecting broad valleys and low hills, and is bounded by the Pacific Ocean in the southwest quadrant with high mountains forming the remainder of the perimeter. The general region lies in the semi-permanent high pressure zone of the eastern Pacific. As a result, the climate is mild, tempered by cool sea breezes. This usually mild climatological pattern is interrupted infrequently by periods of extremely hot weather, winter storms, or Santa Ana winds.

Temperature and Precipitation

The annual average temperature varies little throughout the 6,600-square-mile Basin, ranging from the low 60s to the high 80s, measured in degrees Fahrenheit. With a more pronounced oceanic influence, coastal areas show less variability in annual minimum and maximum temperatures than inland areas. According to the Western Regional Climate Center, the yearly average temperature of City of San Bernardino is 65.9°F.[1] The average low is reported at 39.4°F in December and January while the average high is 96.6°F in July. All areas in the Basin have recorded temperatures above 100°F in recent years, and temperatures as high as 110°F have been recorded at the Ontario station. January is typically the coldest month in this area of the Basin, with minimum temperatures in the 30s.

In contrast to a very steady pattern of temperature, rainfall is seasonally and annually highly variable. Almost all rain falls from November through April. Summer rainfall is normally restricted to widely scattered thunder-showers near the coast, with slightly heavier shower activity in the east and over the mountains. According to the Western Regional Climate Center, rainfall averages around 16.7 inches per year in the City of San Bernardino.

Humidity

Although the Basin has a semi-arid climate, the air near the surface is typically moist because of the presence of a shallow marine layer. Except for infrequent periods when dry, continental air is brought into the Basin by off-shore winds, the ocean effect is dominant. Periods of heavy fog, especially along the coastline,

[1] Western Regional Climate Center. City of San Bernardino. Obtained March, 2005 from http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?casanb

are frequent; and low stratus clouds, often referred to as "high fog" are a characteristic climatic feature. Annual average humidity is 70 percent at the coast and 57 percent in the eastern portions of the Basin.

Wind

Wind patterns across the south coastal region are characterized by westerly and southwesterly on-shore winds during the day and by easterly or northeasterly breezes at night. Wind speed is somewhat greater during the dry summer months than during the rainy winter season.

Between periods of dominant air flow, periods of air stagnation may occur, both in the morning and evening hours. Whether such a period of stagnation occurs is one of the critical determinants of air quality conditions on any given day. During the winter and fall months, surface high pressure systems over the Basin, combined with other meteorological conditions, can result in very strong, down-slope Santa Ana winds. These winds normally continue a few days before predominant meteorological conditions are reestablished.

The mountain ranges to the east represent topographical features that affect the transport and diffusion of pollutants in the project area by inhibiting the eastward transport of pollutants. Air quality in the SoCAB generally ranges from fair to poor and is similar to air quality in most of coastal Southern California. The entire region experiences heavy concentrations of air pollutants during prolonged periods of stable atmospheric conditions.

Inversions

In conjunction with the two characteristic wind patterns that affect the rate and orientation of horizontal pollutant transport, there are two similarly distinct types of temperature inversions that control the vertical depth through which pollutants are mixed. These inversions are the marine/subsidence inversion and the radiation inversion. The height of the base of the inversion at any given time is known as the "mixing height." This mixing height can change under conditions when the top of the inversion does not change. The combination of winds and inversions are critical determinants in leading to the highly degraded air quality in summer and the generally good air quality in the winter in the project area.

Air Pollutants of Concern

Criteria Air Pollutants

The air pollutants emitted into the ambient air by stationary and mobile sources are regulated by Federal and State law. These regulated air pollutants are known as “criteria air pollutants” and are categorized as primary and secondary pollutants. Primary air pollutants are those that are emitted directly from sources. Carbon monoxide (CO), reactive organic gases (ROG), nitrogen oxides (NOx), sulfur dioxide (SO_2) and most fine particulate matter (PM_{10}, $PM_{2.5}$) including lead (Pb) and fugitive dust; are primary air pollutants. Of these CO, SO_2, PM_{10} and $PM_{2.5}$ are criteria pollutants. ROG and NOx are criteria pollutant precursors and go on to form secondary criteria pollutants through chemical and photochemical reactions in the atmosphere. Ozone (O_3) and nitrogen dioxide (NO_2) are the principal secondary pollutants. Presented below is a description of each of the primary and secondary criteria air pollutants and their known health effects.

Other pollutants, such as carbon dioxide, a natural by-product of animal respiration that is also produced in the combustion process, have been linked to such phenomena as global warming. These emissions are unregulated and there are no thresholds for their release. These pollutants do not jeopardize the attainment status of the Basin and so are omitted from further discussion.

Carbon Monoxide (CO) is a colorless, odorless, toxic gas produced by incomplete combustion of carbon substances (e.g., gasoline or diesel fuel). The primary adverse health effect associated with CO is interference with normal oxygen transfer to the blood, which may result in tissue oxygen deprivation.

Reactive Organic Gases (ROGs) are compounds comprised primarily of atoms of hydrogen and carbon. Internal combustion associated with motor vehicle usage is the major source of hydrocarbons. Other sources of ROG include evaporative emissions associated with the use of paints and solvents, the application of asphalt paving and the use of household consumer products such as aerosols. Adverse effects on human health are not caused directly by ROG, but rather by reactions of ROG to form secondary pollutants such as ozone.

Nitrogen Oxides (NOx) serve as integral participants in the process of photochemical smog production. The two major forms of NOx are nitric oxide (NO) and nitrogen dioxide (NO_2). NO is a colorless, odorless gas formed from atmospheric nitrogen and oxygen when combustion takes place under high temperature and/or high pressure. NO_2 is a reddish-brown irritating gas formed by the combination of NO and oxygen. NOx acts as an acute respiratory irritant and increases susceptibility to respiratory pathogens.

Nitrogen Dioxide (NO_2) is a byproduct of fuel combustion. The principal form of NO_2 produced by combustion is NO, but NO reacts with oxygen to form NO_2, creating the mixture of NO and NO_2 commonly called NOx. NO_2 acts as an acute irritant and, in equal concentrations, is more injurious than NO. At atmospheric concentrations, however, NO_2 is only potentially irritating. There is some indication of a relationship between NO_2 and chronic pulmonary fibrosis. Some increase in bronchitis in children (two and three years old) has also been observed at concentrations below 0.3 part per million (ppm). NO_2 absorbs blue light; the result is a brownish-red cast to the atmosphere and reduced visibility. NO_2 also contributes to the formation of PM_{10} (particulates having an aerodynamic diameter of 10 microns or 0.0004 inch or less in diameter) and ozone.

Sulfur Dioxide (SO_2) is a colorless, pungent, irritating gas formed by the combustion of sulfurous fossil fuels. Fuel combustion is the primary source of SO_2. At sufficiently high concentrations, SO_2 may irritate the upper respiratory tract. At lower concentrations and when combined with particulates, SO_2 may do greater harm by injuring lung tissue. A primary source of SO_2 emissions is from the burning of high sulfur content coal.

Particulate Matter (PM) consists of finely divided solids or liquids such as soot, dust, aerosols, fumes and mists. Two forms of fine particulates are now recognized. Course particles, or PM_{10}, include that portion of the particulate matter with an aerodynamic diameter of 10 microns (i.e., 10 one-millionths of a meter or 0.0004 inch) or less. Fine particles, or $PM_{2.5}$, have an aerodynamic diameter of 2.5 microns (i.e., 2.5 one-millionths of a meter or 0.0001 inch) or less. Particulate discharge into the atmosphere results primarily from industrial, agricultural, construction and transportation activities. However, wind action on arid landscapes also contributes substantially to local particulate loading. Both PM_{10} and $PM_{2.5}$ may adversely affect the human respiratory system, especially in those people who are naturally sensitive or susceptible to breathing problems.

Fugitive Dust primarily poses two public health and safety concerns. The first concern is that of respiratory problems attributable to the suspended particulates in the air. Diesel particulates are classified by the CARB as a carcinogen. The second concern is that of motor vehicle accidents caused by reduced visibility during severe wind conditions. Fugitive dust may also cause significant property damage during strong windstorms by acting as an abrasive material agent (much like sandblasting activities). Finally, fugitive dust can result in a nuisance factor due to the soiling of proximate structures and vehicles.

Ozone **(**O_3) or smog is one of a number of substances called photochemical oxidants that are formed when reactive organic compounds (ROC) and NOx (both byproducts of the internal combustion engine) react with sunlight. O_3 is present in relatively high concentrations in the SoCAB, and the damaging effects of photochemical smog are generally related to the concentrations of O_3. O_3 poses a health threat to those who already suffer from respiratory diseases as well as to healthy people. Additionally, O_3 has been tied to crop damage, typically in the form of stunted growth and premature death. O_3 can also act as a corrosive, resulting in property damage such as the degradation of rubber products.

Toxic Air Contaminants

The public's exposure to toxic air contaminants (TACs) is a significant environmental health issue in California. In 1983, the California Legislature enacted a program to identify the health effects of TACs and to reduce exposure to these contaminants to protect the public health. The Health and Safety Code defines a TAC as "an air pollutant which may cause or contribute to an increase in mortality or in serious illness, or which may pose a present or potential hazard to human health." A substance that is listed as a hazardous air pollutant (HAP) pursuant to subsection (b) of Section 112 of the Federal act (42 USC Sec. 7412[b]) is a toxic air contaminant. Under State law, the California Environmental Protection Agency, acting through the CARB, is authorized to identify a substance as a TAC if it determines the substance is an air pollutant that may cause or contribute to an increase in mortality or to an increase in serious illness, or that may pose a present or potential hazard to human health.

California regulates TACs primarily through AB 1807 (Tanner Air Toxics Act) and AB 2588 (Air Toxics "Hot Spot" Information and Assessment Act of 1987). The Tanner Air Toxics Act sets forth a formal procedure for CARB to designate substances as TACs. Once a TAC is identified, CARB adopts an "airborne toxics control measure" for sources that emit designated TACs. If there is a safe threshold for a substance (a point below which there is no toxic effect), the control measure must reduce exposure to below that threshold. If there is no safe threshold, the measure must incorporate toxics best available control technology (T-BACT) to minimize emissions. CARB has, to date, established formal control measures for 11 TACs, all of which are identified as having no safe threshold.

Air toxics from stationary sources are also regulated in California under the Air Toxics "Hot Spot" Information and Assessment Act of 1987. Under AB 2588, toxic air contaminant emissions from individual facilities are quantified and prioritized by the air quality management district or air pollution control district. High priority facilities are required to perform a health risk assessment and, if specific thresholds are exceeded, are required to communicate the results to the public in the form of notices and public meetings.

To date the CARB has designated nearly 200 compounds as TACs. Additionally, the CARB has implemented control measures for a number of compounds that pose high risks and show potential for effective control. The majority of the estimated health risks from TACs can be attributed to a relatively few compounds, one of the most important in the southern California being particulate matter from diesel-fueled engines.

In 1998, the CARB had identified particulate emissions from diesel-fueled engines (diesel PM) as a TAC. Previously, the individual chemical compounds in the diesel exhaust were considered as TACs. Almost all diesel exhaust particle mass is in the fine particle range of 10 microns or less in diameter. Because of their extremely small size, these particles can be inhaled and eventually trapped in the bronchial and alveolar regions of the lung.

In 2000, the SCAQMD conducted a study on ambient concentrations of TACs and estimated the potential health risks from air toxics. The results showed that the overall risk for excess cancer from a lifetime exposure to ambient levels of air toxics was about 1,400 in a million. The largest contributor to this risk was diesel exhaust, accounting for 71 percent of the air toxics risk.

Other Effects of Air Pollution

Just as humans are affected by air pollution, so too are plants and animals. Animals must breathe the same air and are subject to the same types of negative health effects. Certain plants and trees may absorb air pollutants that can stunt their development or cause premature death. There are also numerous impacts to our economy including lost workdays due to illness, a desire on the part of business to locate in areas with a healthy environment, and increased expenses from medical costs. Pollutants may also lower visibility and cause damage to property. Certain air pollutants are responsible for discoloring painted surfaces, eating

away at stones used in buildings, dissolving the mortar that holds bricks together, and cracking tires and other items made from rubber.

In conformance with the requirements of the Clean Air Act Amendments, the Federal Environmental Protection Agency (EPA) has prepared a monetary cost/benefit analysis related to implementation requirements. By the year 2010, the EPA estimates that its emissions reductions programs would cost approximately 27 billion dollars. The programs are estimated to result in a savings benefit of 110 billion dollars for a net benefit of 83 billion dollars[2]. While these values are for the nation as a whole, a net benefit ratio of about 4:1 is noted and a similar ratio could be expected for the City of San Bernardino and its residents.

Another direct cost/benefit issue relates to Federal funding. Areas that do not meet the Federal air quality standards may lose eligibility for Federal funding for road improvements and other projects that require Federal or California Department of Transportation approval.

Cleaner air also yields benefits to ecological systems. The quantified benefits of Clean Air Act Amendments programs reflected in the overall monetary benefits include: increased agricultural and timber yields; reduced effects of acid rain on aquatic ecosystems; and, reduced effects of nitrogen deposited to coastal estuaries. Many ecological benefits, however, remain difficult or impossible to quantify, or can only be quantified for a limited geographic area. The magnitude of quantified benefits and the wide range of unquantified benefits nonetheless suggest that as we learn more about ecological systems and can conduct more comprehensive ecological benefits assessments, estimates of these benefits could be substantially greater.

Regulatory Setting

The development in the City of San Bernardino and SOI areas has the ability to release gaseous emissions of criteria pollutants and dust into the ambient air, it falls under the ambient air quality standards promulgated on the local, State, and Federal levels. The City of San Bernardino is located in the SoCAB and is subject to the rules and regulations imposed by the South Coast Air Quality Management District (SCAQMD). However, the SCAQMD reports to the California Air Resources Board (CARB), and all criteria emissions are also governed by the California Ambient Air Quality Standards (CAAQS) as well as the National Ambient Air Quality Standards (NAAQS).

Ambient Air Quality Standards (AAQS)

The Clean Air Act Amendment of 1971 established national Ambient Air Quality Standards (AAQS), with states retaining the option to adopt more stringent standards or to include other pollution species. These standards are the levels of air quality considered to provide a margin of safety in the protection of the public health and welfare. They are designed to protect those "sensitive receptors" most susceptible to further respiratory distress such as asthmatics, the elderly, very young children, people already weakened by other disease or illness and persons engaged in strenuous work or exercise. Healthy adults can tolerate occasional exposure to air pollutant concentrations considerably above these minimum standards before adverse effects are observed.

Both the State of California and the Federal government have established health based Ambient Air Quality Standards for six air pollutants. As shown in Table 5.2-1, these pollutants include ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, suspended particulate matter (PM_{10}) and lead. ($PM_{2.5}$ particulate matter has also recently been added to this listing. However, for regulatory reasons discussed below and because the SCAQMD has not issued daily criteria for this type of pollutant, potential $PM_{2.5}$ impacts are omitted from this analysis.) In addition, the State has set standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility

[2] US. Environmental Protection Agency. *Benefits and Costs of the Clean Air Act*. Final Report to Congress on Benefits and Costs of the Clean Air Act, 1990 to 2010. EPA 410-R-99-001.

reducing particles. These standards are designed to protect the health and welfare of the populace with a reasonable margin of safety.

Table 5.2-1
Ambient Air Quality Standards for Criteria Pollutants

Pollutant	Averaging Time	California Standard	Federal Primary Standard	Major Pollutant Sources
Ozone (O_3)	1 hour	0.09 ppm	0.12 ppm	Motor vehicles, paints, coatings, and solvents.
	8 hours	0.07 ppm	0.08 ppm	
Carbon Monoxide (CO)	1 hour	20 ppm	35 ppm	Internal combustion engines, primarily gasoline-powered motor vehicles.
	8 hours	9.0 ppm	9 ppm	
Nitrogen Dioxide (NO_2)	Annual Average	*	0.05 ppm	Motor vehicles, petroleum-refining operations, industrial sources, aircraft, ships, and railroads.
	1 hour	0.25 ppm	*	
Sulfur Dioxide (SO_2)	Annual Average	*	0.03 ppm	Fuel combustion, chemical plants, sulfur recovery plants, and metal processing.
	1 hour	0.25 ppm	*	
	24 hours	0.04 ppm	0.14 ppm	
Suspended Particulate Matter (PM_{10})				
	Annual Arithmetic Mean	20 $\mu g/m^3$	50 $\mu g/m^3$	Dust and fume-producing construction, industrial, and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities (e.g. wind-raised dust and ocean sprays).
	24 hours	50 $\mu g/m^3$ (PM_{10})	150 $\mu g/m^3$ (PM_{10})	
Suspended Particulate Matter ($PM_{2.5}$)	Annual Arithmetic Mean	12 $\mu g/m^3$	15 $\mu g/m^3$	Dust and fume-producing construction, industrial, and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities (e.g. wind-raised dust and ocean sprays).
	24 hours	*	65 $\mu g/m^3$	
Lead (Pb)	Monthly	1.5 $\mu g/m^3$	*	Present source: lead smelters, battery manufacturing & recycling facilities. Past source: combustion of leaded gasoline.
	Quarterly	*	1.5 $\mu g/m^3$	
Sulfates (SO_4)	24 hours	25 $\mu g/m^3$	*	Industrial processes.

ppm: parts per million; $\mu g/m^3$: micrograms per cubic meter
* = standard has not been established for this pollutant/duration by this entity.

Air Quality Management Planning

The SCAQMD and the Southern California Association of Governments (SCAG) are the agencies responsible for preparing the Air Quality Management Plan (AQMP) for the SoCAB. Since 1979, a number of AQMPs have been prepared. The 1997 AQMP, updated in 1999 and replaced in 2003, was based on the 1994 AQMP and on the 1991 AQMP, and was designed to comply with State and Federal requirements, reduce the high level of pollutant emissions in the SoCAB, and ensure clean air for the region through various control measures. To accomplish its task, the 1991 AQMP relied on a multilevel partnership of governmental agencies at the Federal, State, regional, and local level. These agencies (i.e., the USEPA, CARB, local governments, SCAG, and SCAQMD) are the cornerstones that implement the AQMP programs.

The most recent comprehensive plan is the 2003 Air Quality Management Plan, which was adopted on August 1, 2003. The 2003 AQMP updates the attainment demonstration for the Federal standards for ozone and particulate matter (PM_{10}); replaces the 1997 attainment demonstration for the Federal carbon monoxide (CO) standard and provides a basis for a maintenance plan for CO for the future; and updates the maintenance plan for the Federal nitrogen dioxide (NO_2) standard that the South Coast Air Basin (Basin) has met since 1992. The AQMP provides local guidance for the State Implementation Plan (SIP) which provides the framework by which air quality basins would achieve attainment of the State and federal ambient air quality standards.

Areas that meet ambient air quality standards are classified as “attainment” areas, while areas that do not meet these standards are classified as “non-attainment” areas. Severity classifications for ozone non-attainment include and range in magnitude from: marginal, moderate, serious, severe and extreme. The attainment status for the SoCAB is included in Table 5.2-2.

Table 5.2-2
Attainment Status for the SoCAB

Pollutant	State Status	Federal Status
Ozone	Extreme Non-attainment	Extreme Non-attainment
PM_{10}	Serious Non-attainment	Serious Non-attainment
CO	Attainment	Attainment/Maintenance
NO_2	Attainment	Attainment/Maintenance

The Basin is also designated as attainment of the CAAQS for SO_2, lead, and sulfates. Areas that are extreme non-attainment of the ozone standard must meet attainment by November 15, 2010. Areas considered as serious non-attainment of the PM_{10} standards must reach attainment by December 31 of the year 2006, or as expeditiously as possible.

Federal Clean Air Act Requirements

The CAA requires the creation of plans to provide for the implementation of all reasonably available control measures, including the adoption of reasonably available control technology, for reducing emissions from existing sources. Emission control innovations in the form of market-based approaches are explicitly encouraged by the CAA. The SCAQMD is the first local agency in the country to adopt a market-based approach for controlling stationary source emissions of oxides of nitrogen and sulfur. Other Federal requirements addressed in the revision include mechanisms to track plan implementation and milestone compliance for O_3 and CO.

The USEPA is now phasing out and replacing the current 1-hour primary ozone standard with a new 8-hour standard to protect against longer exposure periods. The new ozone standard is set at a concentration of

0.08 parts per million (ppm) and represents a tightening of the existing 1-hour ozone standard, which is currently set at 0.12 ppm. Under the standard adopted by USEPA, areas are allowed to disregard their three worst measurements every year and average their fourth highest measurements over three years to determine if they meet the standard.

For particulate matter, the USEPA established a new annual and a 24-hour standard for $PM_{2.5}$ to complement the existing PM_{10} standards. The new annual $PM_{2.5}$ standard is set at 15 micrograms per cubic meter and the new 24-hour $PM_{2.5}$ standard is set at 65 micrograms per cubic meter. The annual component of the standard was set to provide protection against typical day-to-day exposures as well as longer-term exposures, while the daily component protects against more extreme short-term events. For the new 24-hour $PM_{2.5}$ standard, the form of the standard is based on the 98th percentile of 24-hour $PM_{2.5}$ concentrations measured in a year (averaged over three years) at the monitoring site with the highest measured values in an area. This form of the standard will reduce the impact of a single high exposure event that may be due to unusual meteorological conditions and thus provide a more stable basis for effective control programs.

While USEPA has retained the current annual PM_{10} standard of 50 micrograms per cubic meter, it has modified the form of the 24-hour PM_{10} standard set at 150micrograms per cubic meter. More specifically, USEPA revised the one-expected exceedance form of the current standard with a 99th percentile form, averaged over three years.

The state implementation plans that will incorporate attainment demonstrations with the new 8-hour and $PM_{2.5}$ standards are expected to be required within three years of the air quality designations, or by 2007. Therefore, the current regulatory control strategies will continue to focus on attaining the 1-hour ozone standard, with the recognition that these controls will have benefits toward attaining the 8-hour ozone and $PM_{2.5}$ standards. The USEPA is considering several options in transitioning from the 1-hour to the 8-hour standard, while ensuring that no backsliding will occur. Based on the recent consent decree guidance, it is most likely that the Basin will have to meet the federal $PM_{2.5}$ standards by 2014 and the 8-hour ozone standard by 2021.

Baseline Air Quality

Existing levels of ambient air quality and historical trends and projections in the City of San Bernardino and SOI area are best documented by measurements made by the SCAQMD. The City of San Bernardino is located within the central portion of Source Receptor Area (SRA) 34 (Central San Bernardino Valley). The SCAQMD air quality monitoring station in the SRA34 is located within the City of San Bernardino on 4th street. Data from this station is summarized below in Table 5.2-3.

Table 5.2-3
Ambient Air Quality Monitoring Summary

Pollutant/Standard	Number of Days Threshold Were Exceeded and Maximum Levels During Such Violations				
	2000	2001	2002	2003	2004
Ozone					
State 1-Hour $\geq$ 0.09 ppm	48	56	43	59	55
State 8-Hour $\geq$ 0.07 ppm	–	–	–	–	–
Federal 1-Hour > 0.12 ppm	7	18	6	19	9
Federal 8-Hour > 0.08 ppm	23	38	29	45	39
Max. 1-Hour Conc. (ppm)	0.149	0.184	0.147	0.160	0.157
Max. 8-Hour Conc. (ppm)	0.126	0.144	0.112	0.137	0.129
Carbon Monoxide					
State 8-Hour > 9.0 ppm	0	0	0	0	0
Federal 8-Hour $\geq$ 9.5 ppm	0	0	0	0	0
Max. 8-Hour Conc. (ppm)	4.14	3.26	3.20	4.45	3.24
Nitrogen Dioxide					
State 1-Hour $\geq$ 0.25 ppm	0	0	0	0	0
Max. 1-Hour Conc. (ppm)	0.106	0.114	0.105	0.101	0.118
Coarse Particulates (PM_{10})[3]					
State 24-Hour > 50 $\mu g/m^3$	32	31	33	23	4
Federal 24-Hour > 150 $\mu g/m^3$	0	0	0	0	0
Max. 24-Hour Conc. ($\mu g/m^3$)	108.0	106.0	94.0	98.0	118.0
Fine Particulates ($PM_{2.5}$)[3]					
Federal 24-Hour > 65 $\mu g/m^3$	2	5	3	1	3
Max. 24-Hour Conc. ($\mu g/m^3$)	89.8	78.5	82.1	73.9	81.9

ppm: parts per million; $\mu g/m^3$: micrograms per cubic meter
Source: South Coast Air Quality Management District. San Bernardino 4th Street Monitoring Station

The data show recurring violations of both the State and Federal ozone standards. The data also indicate that the area regularly exceeds the State PM_{10} standards. Additionally, $PM_{2.5}$ has exceeded the Federal standard since this pollutant has been monitored. Neither the CO nor NO_2 standard have been violated in the last five years at this station.

Sensitive Receptors

Some land uses are considered more sensitive to air pollution than others due to the types of population groups or activities involved. Sensitive population groups include children, the elderly, the acutely ill, and the chronically ill, especially those with cardio-respiratory diseases.

Residential areas are also considered to be sensitive receptors to air pollution because residents (including children and the elderly) tend to be at home for extended periods of time, resulting in sustained exposure to any pollutants present. Other sensitive receptors include retirement facilities, hospitals, and schools. Recreational land uses are considered moderately sensitive to air pollution. Although exposure periods are generally short, exercise places a high demand on respiratory functions, which can be impaired by air pollution. In addition, noticeable air pollution can detract from the enjoyment of recreation. Industrial and commercial areas are considered the least sensitive to air pollution. Exposure periods are relatively short and intermittent, as the majority of the workers tend to stay indoors most of the time. In addition, the working population is generally the healthiest segment of the public.

5.2.1.2 Arrowhead Springs

The Arrowhead Springs Specific Plan Area is also located in the central portion of SRA 24. The closest monitoring station to Arrowhead Springs is also the San Bernardino 4th Street monitoring station. Refer to Table 5.2-3 for existing air quality for the Arrowhead Springs Specific Plan area.

5.2.2 Thresholds of Significance

According to Appendix G of the CEQA Guidelines, a project would normally have a significant effect on the environment if the project would:

AQ-1 Conflict with or obstruct implementation of the applicable air quality plan.

AQ-2 Violate any air quality standard or contribute substantially to an existing or projected air quality violation.

AQ-3 Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors).

AQ-4 Expose sensitive receptors to substantial pollutant concentrations.

AQ-5 Create objectionable odors affecting a substantial number of people.[3]

The Initial Study, included as Volume 2, Appendix A, substantiates that impacts associated with the following thresholds would be less than significant only for the General Plan: AQ-5

South Coast Air Quality Management District Thresholds

CEQA allows for the significance criteria established by the applicable air quality management or air pollution control district to be used to assess impacts of a project on air quality. The SCAQMD has established thresholds of significance for air quality for construction activities and project operation as shown below in Table 5.2-4:

Table 5.2-4
SCAQMD's Significance Thresholds

Air Pollutant	Construction Phase	Operational Phase
Reactive Organic Gases (ROG)	75 lbs/day	55 lbs/day
Carbon Monoxide (CO)	550 lbs/day	550 lbs/day
Nitrogen Oxides (NO_X)	100 lbs/day	55 lbs/day
Sulfur Oxides (SO_X)	150 lbs/day	150 lbs/day
Particulates (PM_{10})	150 lbs/day	150 lbs/day

[3] The Initial Study concluded impacts less than significant for this threshold for the General Plan however, the Initial Study did not analyze odor impacts from the proposed wastewater treatment plant proposed as part of the Arrowhead Springs Specific Plan. As a result, odor impacts will be discussed for the Arrowhead Springs Specific Plan project.

In addition to the daily thresholds listed above, projects are also subject to the ambient air quality standards. These are addressed though an analysis of localized CO impacts. The California 1-hour and 8-hour CO standards are:

- 1 hour = 20 parts per million
- 8 hour = 9 parts per million

5.2.3 Environmental Impacts

5.2.3.1 San Bernardino General Plan

The following impact analysis addresses those air quality issues for which the Initial Study disclosed potentially significant impacts. The applicable thresholds are identified in parentheses after the impact statement.

The City of San Bernardino General Plan guides growth and development within the City of San Bernardino. The City of San Bernardino had a year 2000 population of 185,401 and 63,535 housing units[4], which does not include the City's SOI area. Upon build-out of the General Plan, San Bernardino's future population is projected to grow to 276,264 in the City and 42,976 in the SOI areas.

The included analysis is based on methodologies and emission factors included in the SCAQMD Handbook and URBEMIS2002 computer model and CARB's EMFAC2002 and CALINE4 computer models.

GP IMPACT 5.2-1: THE SAN BERNARDINO GENERAL PLAN UPDATE IS CONSISTENT WITH THE SOUTH COAST AQMP. [THRESHOLD AQ-1]

Impact Analysis: CEQA requires that General Plans be evaluated for consistency with the AQMP. A consistency determination plays an important role in local agency project review by linking local planning and individual projects to the AQMP. It fulfills the CEQA goal of informing decision-makers of the environmental effects of the project under consideration at a stage early enough to ensure that air quality concerns are fully addressed. It also provides the local agency with ongoing information as to whether they are contributing to clean air goals contained in the AQMP. Only new or amended General Plan elements, Specific Plans, and major projects need to undergo a consistency review. This is because the AQMP strategy is based on projections from local General Plans. Projects that are consistent with the local General Plan are considered consistent with the air quality-related Regional Plan.

Discussion with the SCAQMD (Susan Nakamura, Planning Manager, (March 2, 2004) noted that if growth projections included in the 2003 AQMP are not exceeded, a project would generally be considered to be consistent with the 2003 AQMP if it incorporates emissions reduction measures included in the 2003 AQMP. The emissions forecasted within the 2003 AQMP are based on forecasts of various socioeconomic categories such as population, housing and employment. These demographic growth forecasts were developed by SCAG for their 2001 Regional Transportation Program (RTP) to estimate future emissions described in the 2003 AQMP and in the demonstration of attainment of the State and federal Ambient Air Quality Standards (AAQS).

As shown in Section 5.8, *Land Use*, in Table 5.8-4, the existing General Plan population and buildout projections are greater than those projected for the General Plan Update. As a result, the General Plan update would be consistent with the AQMP as the growth and buildout projections do not exceed those projected within the existing General Plan.

[4] US Census Bureau 2000.

GP IMPACT 5.2-2: ***CONSTRUCTION ACTIVITIES ASSOCIATED WITH THE PROPOSED PROJECT WOULD GENERATE SHORT-TERM EMISSIONS WHILE LONG-TERM OPERATION OF THE PROJECT WOULD GENERATE ADDITIONAL VEHICLE TRIPS AND ASSOCIATED EMISSIONS IN EXCEEDANCE OF SCAQMD'S THRESHOLD CRITERIA. [THRESHOLDS AQ-2 AND AQ-3]***

Impact Analysis:

Construction

Construction activity would occur over the build-out horizon in accordance with the proposed General Plan Update would cause temporary, short-term emissions of various air pollutants. ROG, NOx, PM_{10} and CO would be emitted by the operation of construction equipment, while fugitive dust (PM_{10}) would be emitted by activities that disturb the soil, such as grading and excavation, road construction and building demolition and construction. Information regarding specific development projects, soil types, and the locations of receptors would be needed in order to quantify the level of impact associated with construction activity. However, given the amount of development that the proposed General Plan Update could accommodate, it is reasonable to conclude that some major construction activity could occur at any given time over the life of the General Plan, which could exceed SCAQMD's adopted thresholds and would result in a significant air quality impact due to construction activities.

Operation

The San Bernardino General Plan Update guides growth and development within the City of San Bernardino by designating land uses and through implementation of goals and policies. With growth, comes additional emissions generate by stationary and vehicular sources. These emissions contribute to the overall emissions inventory in the air basin.

The project includes the planned development within developed and undeveloped portions of the City. Upon General Plan build-out, the City of San Bernardino is anticipated too have 95,664 housing units, approximately 195.7 million square-feet of commercial and industrial uses, 7.4 million square feet of public facilities, and 3,091 acres of public and private open space. Although the San Bernardino General Plan does not assume an ultimate build-out date, the General Plan assumes an annual rate of growth. To obtain air quality emissions estimates of the amount of emissions attributable to the additional development associated with the proposed General Plan update, the UBEMIS2002 emissions inventory model was used. The additional land use development due to the build-out of the General Plan update is based on the difference in development between year 2005 and 2030 conditions. There is no data on the total existing year 2005 land use areas. As such, 2005 development areas were calculated based on housing and employment projections from the RTP as detailed in Table 5.11-2 in Section 5.11, *Population and Housing*. While build-out will ultimately be market driven, for modeling purposes this analysis is based on the assumption that all uses will be implemented by the year 2030 and emissions are based on this horizon.

Operational impacts could result from local and regional vehicle emissions generated by future traffic growth, as well as direct emissions due to the use of on-site utilities and consumer goods associated with the proposed land uses. The daily number of vehicle trips associated with build-out of the proposed General Plan was based the URBEMS2002 trip generation calculations assumed from build-out associated with the proposed land uses. The total emissions generated by the proposed land uses are included in Table 5.2 4. To calculate the increase in emissions that would occur due to the increased development discussed under the General Plan Update, emissions associated with the additional development was calculated and evaluated against the SCAQMD daily operational phase emissions thresholds.

In addition to vehicle emissions, emissions would be created from stationary sources including the use of natural gas, the use of landscape maintenance equipment, fireplaces and the use of consumer products,

such as aerosol sprays. Emissions were calculated for both the summer and winter seasons. The primary differences in emissions between these two seasons are fireplace emissions that occur in the winter. Emissions from wood fired fire places contribute substantial emissions during the winter season. These emissions are also predicted by the URBEMIS2002 model and included in Table 5.2 6. Various industrial and commercial processes (e.g., dry cleaning) allowed under the proposed General Plan Update would also be expected to release emissions; some of which could be hazardous. These emissions are controlled at the local and regional level through permitting and would be subject to further study and health risk assessment prior to the issuance of any necessary air quality permits. Because the nature of these emissions cannot be determined at this time, and are subject to further regulation and permitting, they will not be addressed further in this analysis.

As noted in Table 5.2-5, future growth in accordance with the proposed General Plan Update would exceed the daily SCAQMD thresholds for CO, NOx, ROG, PM_{10}. The exceedance of the SCAQMD emissions thresholds would be expected because these thresholds were designed for individual projects. As such, specific or general plans would substantially exceed the SCAQMD thresholds by orders of magnitude because these plans incorporate the development of multitudes of individual projects. Exceedance of the SCAQMD daily emissions thresholds is considered to result in a significant adverse impact.

Table 5.2-5
Project Related Operational Phase Emissions
(In Pounds Per Day)

General Plan Build-Out Year 2030					
Summer	***ROG***	***NOx***	***CO***	***SO_2***	***PM_{10}***
Area Sources	574	448	218	1	1
Vehicle Sources	2,418	2,098	25,754	70	12,164
Total	2,991	2,546	25,972	71	12,164
Winter	***ROG***	***NOx***	***CO***	***SO_2***	***PM_{10}***
Area Sources	12,868	586	13,746	21	1,859
Vehicle Sources	2,203	3,010	23,881	63	12,164
Total	15,071	3,597	37,627	84	14,022
SCAQMD Standard	**75**	**100**	**550**	**150**	**150**
Significant?	**Yes**	**Yes**	**Yes**	**No**	**Yes**

Source: The Planning Center using the URBEMIS2002 emissions inventory model, March 2005.

GP IMPACT 5.2-3: ***IMPLEMENTATION OF THE SAN BERNARDINO GENERAL PLAN UPDATE WOULD RESULT IN A CUMULATIVELY CONSIDERABLE NET INCREASE OF CRITERIA POLLUTANTS FOR WHICH THE PROJECT REGION IS IN A STATE OF NON-ATTAINMENT. [THRESHOLD AQ-3]***

As discussed previously, the proposed project would result in emissions which exceed the SCAQMD emissions thresholds for both the construction and operational phases. The SCAQMD considers exceedance of their daily significance thresholds to lead to a significant contribution to emissions on a cumulative basis. Because the air basin is currently in a state of non-attainment for CO, ozone and particulate matter, the additional air pollution generated by further development of the General Plan would incrementally contribute to the state of non-attainment of the ambient air quality standards.

GP IMPACT 5.2-4: BUILDOUT OF THE SAN BERNARDINO GENERAL PLAN UPDATE WOULD NOT EXPOSE SENSITIVE RECEPTORS TO SUBSTANTIAL POLLUTANT CONCENTRATIONS. [THRESHOLD AQ-4]

Impact Analysis: An impact is potentially significant if concentration of emissions exceed the State or Federal Ambient Air Quality Standards. Methodologies for the modeling of concentrations of criteria pollutants have not been established at a city level to demonstrate compliance with CEQA requirements. Modeling concentrations of pollutants at this macro level of analysis is typically only performed by local air quality districts. Macro scale analyses of pollutant concentrations would involve urban airshed modeling which involves multiple cities and meteorological data and are not conducted for General Plans. However, a defined methodology has been established by the SCAQMD to determine concentrations of CO at a local level such as for individual projects or General Plans. Modeling of CO is performed for vehicle sources because they have the potential for creation of CO "hot spots" at heavily congested intersections. Because CO is produced in greatest quantities from vehicle combustion and does not readily disperse into the atmosphere, adherence to the Ambient Air Quality Standards is typically demonstrated through an analysis of localized CO concentrations. Areas of vehicle congestion have the potential to create "pockets" of CO called "hot spots." These pockets may have the potential to exceed the State 1 hour standard of 20 ppm and/or the 8 hour standard of 9.0 ppm or Federal levels of 35 and 9 ppm, respectively.

During the operations phase of the General Plan Update, traffic may have the potential to contribute to local area air quality impacts. Analysis at selected intersections was performed to determine the potential for the presence or the creation of CO hot spots attributable to the proposed project. Local area CO concentrations were projected using the CALINE4 traffic pollutant dispersion model. The analysis of CO impacts followed the protocol recommended by the California Department of Transportation's Transportation Project-Level Carbon Monoxide Protocol (Protocol) (December 1997). It is also consistent with procedures identified through the SCAQMD CO modeling protocol, with all four corners of each intersection analyzed to determine whether project operations would result in CO concentrations that exceed the national or state CO AAQS. Consistent with and required by the Caltrans Protocol, sensitive receptor monitoring was conducted 10 feet from the edge of the road for each corner of the intersection. Placing the sensitive receptor locations 10 feet from the edge of the road at each corner of the study intersection represents a worst case modeling approach in which these locations are exposed to peak hour traffic volumes traveling at speeds associated with congested road conditions and under meteorological conditions conducive to pollutant formation. Receptor locations further than 10 feet from the edge of the road and further from the study intersection would experience lower concentrations of CO due to increase pollutant dispersion from the pollutant source.

The CALINE4 model generates results of CO concentrations averaged over a one-hour time period under worst case atmospheric conditions for the area which include low wind speeds and low atmospheric circulation. Eight-hour concentrations were calculated by converting the 1-hour concentrations to 8-hour equivalents, using the conversion protocol recommended by the SCAQMD.

Future CO concentrations were determined by adding the predicted increase in CO concentrations attributable to the operation of the proposed project to a projected ambient concentration. Traffic conditions during the build-out year of year of the project were modeled for the baseline traffic scenario (i.e., future traffic not including the project) and the baseline-plus-project condition. CO concentrations associated with both the baseline and baseline-plus-project condition are evaluated against the AAQS.

Congested intersections that are most conducive to the formation of CO hotspots were modeled. Table 5.2-6 lists the existing year 2003 and build-out year 2030 CO concentrations that would occur at the study area intersections, with and without the proposed project. Build-out year CO concentrations were found to be lower than the existing year 2005 concentrations due to technological improvements in vehicle emissions. Based on the CALINE4 analyses, neither the existing nor future year traffic would result in any exceedances of the state 1-hour CO AAQS at the study area intersections. Similarly, 8-hour concentrations at the analyzed

intersections would be below the state AAQS, as shown in Table 5.2-7. Consequently, sensitive receptors in the area would not be significantly adversely affected by CO emissions generated by operation of the proposed project. Localized air quality impacts related to CO from mobile source emissions would therefore be less than significant for the proposed project.

Table 5.2-6
One-Hour Carbon Monoxide Dispersion Analysis For Existing Year 2000 and Year 2030 Build-out Year of the General Plan Update (In Parts Per Million)

Receptor	Existing Year	Year 2030 Build-out	SCAQMD Threshold	Significant Impact?
Hunts Lane/E Street				
Northeast	7.7	3.9	20	No
Southeast	7.4	3.9	20	No
Southwest	6.6	3.8	20	No
Northwest	8.0	3.9	20	No
Waterman Avenue/30th Street				
Northeast	6.6	3.8	20	No
Southeast	6.1	3.9	20	No
Southwest	7.2	3.9	20	No
Northwest	6.7	3.9	20	No
SR-30 Westbound Ramp/30th Street				
Northeast	5.7	3.8	20	No
Southeast	5.6	3.8	20	No
Southwest	5.5	3.8	20	No
Northwest	5.7	3.8	20	No
Tippecanoe Avenue/Rialto Avenue				
Southeast	6.0	3.8	20	No
Southwest	5.9	3.8	20	No
Northwest	5.9	3.8	20	No
Northeast	5.8	3.8	20	No
Mountain View/San Bernardino Road				
Northeast	5.4	3.8	20	No
Southeast	6.2	3.9	20	No
Southwest	5.9	3.9	20	No
Northwest	5.9	3.9	20	No

Source: The Planning Center based on the Caltrans' traffic emission dispersion model CALINE4

Table 5.2-7
Eight-Hour Carbon Monoxide Dispersion Analysis For Existing Year 2000 and Year 2030 Build-out Year of the General Plan Update (In Parts Per Million)

Receptor	Existing Year	Year 2025 Build-out	SCAQMD Threshold	Significant Impact?
Hunts Lane/E Street				
Northeast	5.8	3.1	9	No
Southeast	5.6	3.1	9	No
Southwest	5.0	3.0	9	No
Northwest	6.0	3.1	9	No
Waterman Avenue/30th Street				
Northeast	5.0	3.0	9	No
Southeast	4.7	3.1	9	No
Southwest	5.5	3.1	9	No
Northwest	5.1	3.1	9	No
SR-30 Westbound Ramp/30th Street				
Northeast	4.4	3.0	9	No
Southeast	4.3	3.0	9	No
Southwest	4.3	3.0	9	No
Northwest	4.4	3.0	9	No
Tippecanoe Avenue/Rialto Avenue				
Southeast	4.6	3.0	9	No
Southwest	4.6	3.0	9	No
Northwest	4.6	3.0	9	No
Northeast	4.5	3.0	9	No
Mountain View/San Bernardino Road				
Northeast	4.2	3.0	9	No
Southeast	4.8	3.1	9	No
Southwest	4.6	3.1	9	No
Northwest	4.6	3.1	9	No

Source: The Planning Center based on the Caltrans' traffic emission dispersion model CALINE4

Relevant General Plan Policies and Programs

The relevant General Plan policies and programs pertaining to air quality include the following:

Natural Resources and Conservation Element

Policy 12.4.2: Impose conditions and enforce mitigation measures on mining operations to reduce dust, noise, and safety hazards associated with removal of construction aggregate and minimize impacts on adjacent properties and environmental resources.

Policy 12.4.8: Require that new, non-mining land uses adjacent to existing mining operations be designed to provide a buffer between the new development and the mining operations. The buffer distance shall be based on an evaluation of noise, aesthetics, drainage, operating conditions, biological resources, topography, lighting, traffic, operating hours, and air quality.

Policy 12.5.1: Reduce the emission of pollutants including carbon monoxide, oxides of nitrogen, photochemical smog, and sulfate in accordance with South Coast Air Quality Management District (SCAQMD) standards.

Policy 12.5.2: Prohibit the development of land uses (e.g. heavy manufacturing) that will contribute significantly to air quality degradation, unless sufficient mitigation measures are undertaken according SCAQMD standards.

Policy 12.5.3: Require dust abatement measures during grading and construction operations.

Policy 12.5.4: Evaluate the air emissions of industrial land uses to ensure that they will not impact adjacent uses.

Policy 12.5.5: Purchase City vehicles that use energy efficient fuel and minimize air pollution.

Policy 12.6.1: Promote a pattern of land uses which locates residential uses in close proximity to employment and commercial services and provides, to the fullest extent possible, local job opportunities and commercial service to minimize vehicular travel and associated air emissions.

Policy 12.6.2: Disperse urban service centers (libraries, post offices, social services, etc.) throughout the City to minimize vehicle miles traveled and the concomitant dispersion of air pollutants.

Policy 12.6.3: Install streetscape improvements and other amenities to encourage pedestrian activity in key City areas and reduce vehicular travel and associated air emissions.

Policy 12.6.4: Facilitate the development of centralized parking lots and structures in commercial districts to promote walking between individual businesses in lieu of the use of automobiles. (LU-1)

Policy 12.6.5: Require qualifying development to implement or participate in transportation demand management programs, which provide incentives for car pooling, van pools, and the use of public transit and employ other trip reduction techniques (consistent with the Circulation Element and South Coast Air Quality Management Plan).

Policy 12.6.6: Continue to cooperate with Omnitrans and the Rapid Transit District to expand as necessary the comprehensive mass transit system for the City to reduce vehicular travel.

Policy 12.6.7: Promote the use of public transit and alternative travel modes to reduce air emissions.

Policy 12.7.1: Cooperate with the South Coast Air Quality Management District and incorporate pertinent local implementation provisions of the Air Quality Management Plan.

Policy 12.7.2: Work with the South Coast Air Quality Management District to establish controls and monitor uses in the City that could add to the air basin's degradation (e.g. auto repair, manufacturers).

Policy 12.7.3: Coordinate with SCAQMD to ensure that all elements of air quality plans regarding reduction of air pollutant emissions are being enforced.

Policy 12.7.4: Work with the other cities in the South Coast Air Basin to implement regional mechanisms to reduce air emissions and improve air quality.

Policy 12.7.5: Support legislation that promotes cleaner industry, clean fuel vehicles, and more efficient burning engines and fuels.

Policy 12.7.6: Encourage, publicly recognize, and reward innovative approaches to improve air quality.

Policy 12.7.8: Involve environmental groups, the business community, special interests, and the general public in the formulation and implementation of programs that actively reduce airborne pollutants.

5.2.3.2 Arrowhead Springs Specific Plan

The Arrowhead Springs Specific Plan is the blueprint for development for the Arrowhead Springs area. Currently the Arrowhead Springs Specific Plan area is comprised of uses associated with the historical resort onsite, developed around the natural springs in the area. The area is no longer open as resort, however. The facilities present consist of approximately 34 buildings including a hotel, an auditorium, a chapel, dormitories, a pool and cabanas, residential bungalows, office buildings, and maintenance buildings. Only the office, maintenance, and select bungalow buildings are currently utilized.

The uses proposed for the development are discussed in Section 3.3.4 of this DEIR.

AHS IMPACT 5.2-1: THE ARROWHEAD SPRINGS SPECIFIC PLAN PROJECT IS CONSISTENT WITH THE SOUTH COAST AQMP. [THRESHOLD AQ-1]

***Impact Analysis*:** As noted in the discussion of GP IMPACT 5.2-1, SCAQMD would consider a project to be generally consistent with the 2003 AQMP if growth projections included in the 2003 AQMP are not exceeded and the project incorporates emissions reduction measures included in the 2003 AQMP. The explanation of consistency stated in the General Plan Update impact section also applies to the Arrowhead Springs Specific Plan. The majority of the Arrowhead Spring Specific Plan area is currently located outside the City limits for the City of San Bernardino but was also considered within the SOI and was included in the calculations of existing General Plan buildout. As shown in Section 5.8, *Land Use*, in Table 5.8-4, the existing General Plan population and buildout projections are greater than those projected for the General Plan Update. The buildout projections for the General Plan Update also include buildout of the City of San Bernardino and the Sphere of Influence areas, including the Arrowhead Springs Specific Plan project. With the increase in population due to the Arrowhead Springs project, the buildout projections of the existing General Plan are still greater than the proposed update. Given that the AQMP is based on the existing General Plan which has greater projections than the proposed General Plan update and that the buildout projections for the General Plan update include the SOI (and the Arrowhead Springs project), it can be concluded that the Arrowhead Springs Specific Plan would also be consistent with the AQMP.

AHS IMPACT 5.2-2: ***CONSTRUCTION ACTIVITIES ASSOCIATED WITH THE PROPOSED PROJECT WOULD GENERATE SHORT-TERM EMISSIONS WHILE LONG-TERM OPERATION OF THE PROJECT WOULD GENERATE ADDITIONAL VEHICLE TRIPS AND ASSOCIATED EMISSIONS IN EXCEEDANCE OF SCAQMD'S THRESHOLD CRITERIA. [THRESHOLDS AQ-2 AND AQ-3]***

Impact Analysis:

Construction

Construction activities from development of the Arrowhead Springs Specific Plan would produce combustion emissions from various sources such as site grading, utility engines, on-site heavy-duty construction vehicles, equipment-hauling materials to and from the site, asphalt paving, and motor vehicles transporting the construction crew. Exhaust emissions from construction activities envisioned on site would vary daily as construction activity levels change.

Construction activities associated with new development occurring in the project area would temporarily increase air pollutant emissions in the project vicinity. The primary source of air pollutant emissions is gasoline- and diesel-powered, heavy-duty mobile construction equipment such as scrapers and motor graders. Primary sources of PM_{10} emissions would be clearing and demolition activities, excavation and grading operations, construction vehicle traffic on unpaved ground, and wind blowing over exposed earth surfaces. During the construction phase, over 14 million cubic yards of cut and fill soil would be moved (7 million for cut and 7 million for fill onsite) for development of the Arrowhead Springs Specific Plan project footprint. This estimate of disturbed soil does not include remedial grading activities that may be required due eliminate slope instability, which may total an additional 1 million cubic yards.

Emissions generated from construction activities are anticipated to cause temporary increases in pollutant emissions. The quantity of air pollutant emissions generated are dependant on a number of factors, including soil composition on site, the amount of soil disturbed, wind speed, the number and type of machinery used, the construction schedule, and the proximity of other construction and demolition projects. The included analysis is based on the URBEMIS2002 computer model. The results of the URBEMIS2002 computer modeling are included in Table 5.2-8 and assume a worst-case scenario for construction emissions from build-out of the Arrowhead Springs Specific Plan in two phases over a ten year buildout period. The first phase between the years of 2005-2007 assumes demolition, all mass grading, paving of major roads, installation of water and sewer facilities and dry utilities. The second phase would include construction of all structures for residential and commercial use. Site grading would occur over a two year period, with an estimated 28,409 cubic yards of cut and fill per day. Subsequent building construction was then assumed to occur over the following eight years with full buildout in the year 2015. Emissions estimates included in Table 5.2-8 represent worst-case emissions estimates from any given year during those phases.

Table 5.2-8
Project Related Construction Phase Emissions
(In Pounds Per Day)

	CO	ROG	NOx	SO_2	PM_{10}
Site Grading (2005-2007)	184	23	168	0.00	3,362
Building Construction (2007-2015)	483	815	131	0.18	6.11
SCAQMD Standard	550	75	100	150	150
Significant?	**Yes**	**Yes**	**Yes**	No	**Yes**

Source: The Planning Center using the URBEMIS2002 emissions inventory model.

As shown in Table 5.2-8, construction emissions for CO, ROG and NOx would significantly exceed the SCAQMD threshold during both site grading and construction.

Operation

Long-term air emission impacts are those associated with stationary sources and mobile sources related to any change related to the proposed project. The proposed development would consist of 1,350 residential units, 1,049,190 square-feet of commercial and office uses, 199-acre public golf course, a new 300 room hotel and conference center, reuse and expansion of the historic Arrowhead Springs Hotel resort. The stationary sources of emissions from the land uses associated from build-out of the Arrowhead Springs Specific Plan would come from its consumption of natural gas and electricity. Based on the traffic study prepared for the San Bernardino General Plan Update by Transtech Engineers (December 2004), the proposed project would generate 24,412 average daily trips upon cumulative build-out of phase one and phase two of the Arrowhead Springs Specific Plan development. Using the emissions inventory model URBEMIS2002, emissions associated with project-related vehicular trips were calculated and are included in Table 5.2-9.

Table 5.2-9
Project Related Operational Phase Emissions
(In Pounds Per Day)

Summer	***CO***	***ROG***	***NOx***	***SO_2***	***PM_{10}***
Stationary Sources (electricity/natural gas consumption, landscaping)	12	68	19	0	0
Mobile Sources	1,123	117	113	2	230
Total	**1,233**	**185**	**132**	**2**	**230**
SCAQMD Standard	550	55	55	150	150
Significant?	**Yes**	**Yes**	**Yes**	No	**Yes**
Winter	***CO***	***ROG***	***NOx***	***SO_2***	***PM_{10}***
Stationary Sources (electricity/natural gas consumption, landscaping)	1,668	1,580	36	3	228
Mobile Sources	1,155	99	162	1	230
Total	**2,831**	**1,679**	**198**	**4**	**459**
SCAQMD Standard	550	55	55	150	150
Significant?	**Yes**	**Yes**	**Yes**	**No**	**Yes**

Source: The Planning Center using the URBEMIS2002 emissions inventory model.

As shown, project-related emissions would exceed the SCAQMD daily emissions thresholds for CO, ROG, NOx, and PM_{10}. Winter emissions generate substantially more than summer emissions because the residential units were modeled using conservative rates of wood burning fireplaces. Wood burning fireplaces emit a substantial amount of air pollutants because it is an uncontrolled burn. Consequently, this results in substantial emissions differences between summer and winter emissions. Mobile sources of emissions also represent a large portion of operational emissions for the project. Because the proposed project results in emissions which exceed the SCAQMD daily operational phase emissions thresholds, the proposed project's impact to air quality is considered significant.

AHS IMPACT 5.2-3: THE ARROWHEAD SPRINGS SPECIFIC PLAN PROJECT WOULD DELAY ATTAINMENT OF THE SOUTH COAST AQMP [THRESHOLD AQ-3]

As discussed previously, the proposed project would result in emissions which exceed the SCAQMD emissions thresholds for both the construction and operational phases. The SCAQMD considers exceedance of their daily significance thresholds to lead to a significant contribution to emissions on a cumulative basis. Because the air basin is currently in a state of non-attainment for CO, ozone and particulate matter, the additional air pollution generated by further development of the Arrowhead Springs Specific Plan would incrementally contribute to the state of non-attainment of the ambient air quality standards.

AHS IMPACT 5.2-4: IMPLEMENTATION OF THE ARROWHEAD SPRINGS SPECIFIC PLAN PROJECT WOULD NOT EXPOSE SENSITIVE RECEPTORS TO SUBSTANTIAL POLLUTANT CONCENTRATIONS. [THRESHOLD AQ-4]

Impact Analysis: Vehicular trips associated with the proposed project would contribute to the congestion at intersections and along roadway segments in the project vicinity. The primary mobile source pollutant of local concern is CO. Typically, high CO concentrations are associated with roadways or intersections operating at unacceptable levels of service or with extremely high traffic volumes.

The traffic impacts from the build-out of the Arrowhead Springs Specific Plan were included within the traffic volumes of the General Plan update. The traffic volumes were evaluated for the existing year and year 2025. The intersection vehicle turn volumes were used in the Caltrans CALINE4 model to evaluate local CO concentrations at intersections most affected by project traffic. As shown previously, Table 5.2-5 and Table 5.2-6 list the CO concentrations for those intersections that are most impacted by traffic congestion. None of the intersections analyzed would have eight-hour CO concentration exceeding federal and State standards of 9 ppm. The one-hour CO concentration at these intersections would also be below the State standard of 20.0 ppm and below the federal standard of 35 ppm. The proposed project would not have a significant impact on local air quality for CO, and no mitigation measures would be required.

AHS IMPACT 5.2-5: CREATE OBJECTIONABLE ODORS AFFECTING A SUBSTANTIAL NUMBER OF PEOPLE. [THRESHOLD AQ-5]

Construction activity will require the operation of equipment which may generate exhaust from either gasoline or diesel fuel. Construction and development will also require the application of paints and the paving of roads which could generate odors from materials such as paints and asphalt. As these odors are short-term in nature and quickly disburse into the atmosphere, this is not considered significant.

Future residential and commercial development would involve minor, odor-generating activities, such as backyard barbeque smoke, lawn mower exhaust, application of exterior paints from home improvement, etc. These types and concentrations of odors are typical of residential communities and are not considered significant air quality impacts.

The proposed wastewater treatment plant has the potential to generate odors. Modern sewage treatment plants have numerous project design features to control odor emissions during the sewage treatment process which include capture, containment and treatment of foul air. These project design features will, at a minimum, include enclosure of the most odorous wastewater treatment components which may include the headworks, primary clarifiers, digesters and grit chamber to contain odorous air prior to odor treatment. The contained odorous air will be piped into a chemical or biological odor control treatment process which would breakdown hydrogen sulfides and other compounds which are associated with odors.

The proposed project is also required to comply with SCAQMD Rule 402 to prevent occurrence of public nuisances. As a result, the proposed wastewater treatment plant is required to control project related odors to avoid the creation of a public nuisance. Because the proposed project will incorporate odor control

systems as the project design features described above and is subject to mandatory compliance with SCAQMD Rule 402, odorous emissions attributable to the proposed project are not considered a significant adverse impact to air quality.

5.2.4 Existing Regulations and Standard Conditions

SCAQMD Rules and Regulations: The City of San Bernardino and Arrowhead Springs Specific Plan area is located in the SoCAB and is subject to the rules and regulations imposed by the SCAQMD. All emissions within the City of San Bernardino are governed by the CAAQS as well as the NAAQS.

New source pollution sources within the City of San Bernardino would be subject to a new source review by the SCAQMD. Any equipment that emits or controls air contaminants (such as nitrogen oxides or reactive organic gases) requires a permit from AQMD prior to construction, installation, or operation unless it is specifically exempted from the permit requirement by AQMD Rule 219.

SCAQMD Rule 402: SCAQMD Rule 402 states, "A person shall not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public or which cause, or have a natural tendency to cause, injury or damage to business or property."

SCAQMD Rule 403: SCAQMD Rule 403 does not require a permit for construction activities, per se, but rather, sets forth general and specific requirements for all construction sites (as well as other fugitive dust sources) in the SoCAB. The general requirement prohibits a person from causing or allowing emissions of fugitive dust from construction (or other fugitive dust source) such that 1) the presence of such dust remains visible in the atmosphere beyond the property line of the emissions source or, 2) allows dust emissions to exceed 20 percent opacity (as determined by the appropriate test method included in the Rule 403 Implementation Handbook), if the dust emission is the result of movement of a motorized vehicle. No person shall conduct active operations without utilizing the applicable best available control measures (BAC) to minimize fugitive dust emissions from each fugitive dust source type within the active operation.

SCAQMD Rule 403 also prohibits a construction site from causing an incremental PM_{10} concentration impact at the property line of more than 50 micrograms per cubic meter as determined through PM_{10} high-volume sampling, but the concentration standard and associated PM_{10} sampling do not apply if specific measures identified in the rule are implemented and appropriately documented.

SCAQMD Rule 403 identifies two sets of specific measures: one for high wind conditions and the other for more normal wind conditions. When wind gusts exceed 25 miles per hour, neither the sampling requirement nor the general requirement applies so long as the following measures are implemented and appropriately documented:

Source	Control Measure
Earthmoving	Cease all active operations, or apply water to soil not more than 15 minutes prior to moving such soil.
Disturbed Surface Areas	On the last day of active operations prior to a weekend, holiday, or any other period when active operations will not occur for not more than four consecutive days, apply water with a mixture of chemical stabilizer diluted to not less than 1/20 of the concentration required to maintain a stabilized surface for a period of six months; or Apply chemical stabilizers prior to wind event, or Apply water to all unstabilized disturbed areas 3 times per day. If there is any evidence of wind driven fugitive dust, watering frequency is increased to a minimum of four times per day); or Establish a vegetative ground cover within 21 days after active operations have ceased. Ground cover must be of sufficient density to expose less than 30 percent of unstabilized ground within 90 days of planting, and at all time thereafter); or Utilize any combination of the three measures immediately preceding such that, in total, these actions apply to all disturbed surface areas.
Unpaved Roads	Apply chemical stabilizers prior to wind event, or apply water twice per hour during active operation, or stop all vehicular traffic.
Open Storage Piles	Apply water twice per hour, or install temporary coverings.
Paved Road Track-out	Cover all haul vehicles, or comply with the vehicle freeboard requirements of Section 23114 of the California Vehicle Code for both pubic and private roads.

During normal wind conditions (i.e., with wind gusts less than 25 miles per hour), the sampling requirement does not apply so long as the following measures are implemented and appropriately documented:

Source	Control Measure
Earthmoving (not for including construction lines, conduct cut and fill)	Maintain soil moisture content to a minimum of 12 percent when earthmoving, as necessary to prevent visible dust emissions from exceeding 100 feet in length in any direction.
Earthmoving areas (construction than fill areas)	Maintain soil moisture content at a minimum of 12 percent. For soils that have an optimum moisture content for compaction of less than 12 percent, complete the compaction process as expeditiously as possible after achieving at least 70 percent of the optimum soil moisture content.
Earthmoving from (construction cut areas)	Conduct watering as necessary to prevent visible emissions extending more than 100 feet beyond the active cut area unless the area is inaccessible to watering vehicles due to slope conditions or other safety factors.
Disturbed Surface Areas (except completed stabilized, grading areas)	Apply dust suppression in sufficient quantity and frequency to maintain a stabilized surface. Any areas that cannot be stabilized as evidenced by wind driven fugitive dust, must have an application of water at least twice per day to at least 80 percent of the unstabilized area.
Disturbed Surface Areas	Apply chemical stabilizers within five working days of grading completion; or apply water to at least 80 percent of all inactive surface areas on a daily basis when there is evidence of wind driven fugitive dust, except any areas which are inaccessible to watering vehicles due to excessive slope or other safety conditions; or establish a vegetative ground cover within 21 days after active operations have ceased. Ground cover must be of sufficient density to expose less than 30 percent of unstabilized ground within 90 days of planting, and at all times thereafter.

Source	Control Measure
Inactive Disturbed Surface Areas	Apply water to at least 80 percent of all inactive disturbed areas on a daily basis when there is evidence of wind driven fugitive dust, except any areas which are inaccessible to watering vehicles due to excessive slope or other safety conditions; or apply dust suppressants in sufficient quantity and frequency to maintain a stabilized surface; or establish a vegetative ground cover within 21 days after active operations have ceased (ground cover must be of sufficient density to expose less than 30 percent of unstabilized ground within 90 days of planting, and at all times thereafter); or utilize any combination of the above three measures such that, in total, these actions apply to all inactive disturbed surface areas.
Unpaved Roads	Water all roads used for any vehicular traffic at least once per every two hours of active operations; or water all roads used for any vehicular traffic once daily and restrict vehicle speeds to 15 miles per hour; or apply a chemical stabilizer to all unpaved road surfaces in sufficient quantity and frequency to maintain a stabilized surface.
Open Storage Piles	Apply chemical stabilizers; or apply water to at least 80 percent of the surface area of all open storage piles on a daily basis when there is evidence of wind driven fugitive dust; or install temporary coverings; or install a three-sided enclosure with walls with no more than 50 percent porosity which extend, at a minimum, to the top of the pile.

The SCAQMD recently adopted changes to Rule 403 that took effect January 1, 2005. As per the new requirements, no person shall conduct an active operation with a disturbed surface area of five or more acres or with a daily import or export of 100 cubic yards or more of bulk material without utilizing at least one measure at each vehicle egress from the site to a paved public road:

A. Install a pad consisting of washed gravel (minimum-size: one inch) maintained in a clean condition to a depth of at least six inches and extending at least 30 feet wide and at least 50 feet long.

B. Pave the surface extending at least 100 feet and at least 20 feet wide. Utilize a wheel shaker/wheel spreading device consisting of raised dividers (rails, pipe, or grates) at least 24 feet long and 10 feet wide to remove bulk material from tires and vehicle undercarriages before vehicles exit the site.

C. Pave the surface extending at least 100 feet and at least 20 feet wide. Utilize a wheel shaker/wheel spreading device consisting of raised dividers (rails, pipe, or grates) at least 24 feet long and 10 feet wide to remove bulk material from tires and vehicle undercarriages before vehicles exit the site.

D. Install and utilize a wheel washing system to remove bulk material from tires and vehicle undercarriages before vehicles exit the site.

E. Any other control measures approved by the Executive Officer and the U.S. EPA.

In addition to the above requirements the AQMD after January 1, 2005, large operators are required to install and maintain project signage with project contact signage that meets the minimum standards of the Rule 403 Implementation Handbook, prior to initiating any earthmoving activities. Furthermore, large operators must identify a dust control supervisor that: is employed by or contracted with the property owner or developer; is on the site or available on-site within 30 minutes during working hours; has the authority to expeditiously employ sufficient dust mitigation measures to ensure compliance with all Rule requirements; and has completed the AQMD Fugitive Dust Control Class and has been issued a valid Certificate of Completion for the class.

SCAQMD Rule 481: Rule 481 applies to spray coating operations. Under Rule 481, a person shall not use or operate any spray painting or spray coating equipment unless one of the following conditions is met:

- The spray coating equipment is operated inside a control enclosure which is approved by the Executive Officer. Any control enclosure for which an application for permit for new construction, alteration, or change of ownership or location is submitted after the date of adoption of this rule shall be exhausted only through filters at a design face velocity not less than 100 feet per minute nor greater than 300 feet per minute, or through a water wash system designed to be equally effective for the purpose of air;
- Coatings are applied with HVLP, electrostatic and/or airless spray equipment, or
- An alternative method of coating application or control is used which has an effectiveness equal to or greater than the equipment specified in paragraph (c)(1) or (c)(2) of this rule.

SCAQMD Rules 431.1 and 431,2: Require the use of low sulfur fuel for stationary construction equipment.

Wastewater Treatment Plant Operations: The Arrowhead Springs wastewater treatment plant is subject to the rules and regulations imposed by the SCAQMD. As a new source, the proposed Arrowhead Springs wastewater treatment plant is required to obtain a permit for operation of a wastewater treatment plant by the SCAQMD. Under Regulation XIII, Rule 1303, for new source review, the wastewater treatment plant is required to install the Best Available Control Technology (BACT). In addition to review, under SCAQMD new source review, SCAQMD Rule 1179 requires small capacity publicly owned treatment plants to prepare a Facility Description Report to the District and a wastewater analysis report that provides the mass rate of VOCs present in the influent and effluent wastewater. The analysis shall include measurements for average and peak flow rates.

5.2.5 Level of Significance Before Mitigation

5.2.5.1 San Bernardino General Plan

Upon implementation of General Plan policies, regulatory requirements, and standard conditions of approval, the following impacts would be less than significant:

GP Impact 5.2-1 Growth and buildout projections for the General Plan Update are less than the existing General Plan and therefore consistent with the AQMP.

GP Impact 5.2-4 None of the intersections analyzed would have eight-hour CO concentration exceeding federal and State standards of 9 ppm or concentrations exceeding the one-hour CO concentration State standard of 20.0 ppm and federal standard of 35 ppm.

Without mitigation the following impacts from implementation of the General Plan Update would be **significant**:

GP Impact 5.2-2 The magnitude of General Plan buildout development and corresponding generation of air pollutant emissions would result in exceedance of the SCAQMD's construction and operational phase emissions thresholds.

GP Impact 5.2-3 Emissions associated with General Plan buildout would result in emissions which exceed the SCAQMD significance thresholds for construction and operational phases as stated in GP Impact 5.2-2. As such, the SCAQMD considers these emissions to be significant on a cumulative basis. The construction and operation through implementation of the General Plan would result in cumulative air quality impacts.

5.2.5.2 Arrowhead Springs Specific Plan

Upon implementation of regulatory requirements, and standard conditions of approval, the following impacts would be less than significant:

AHS Impact 5.2-1 Growth and buildout projections for the Arrowhead Springs Specific Plan project are included in the San Bernardino General Plan Update, which is consistent with the AQMP. The AQMP forms the basis for attainment of the AAQS. As a result, the project would not have the potential to temporarily delay the attainment of the AAQS.

AHS Impact 5.2-4 The traffic impacts from the build-out of the Arrowhead Springs Specific Plan were included within the traffic volumes of the General Plan update. None of the intersections analyzed would have eight-hour CO concentration exceeding federal and State standards of 9 ppm or concentrations exceeding the one-hour CO concentration State standard of 20.0 ppm and federal standard of 35 ppm.

AHS Impact 5.2-5 With the exception of the wastewater treatment plant, the Arrowhead Springs Specific Plan would not result in land uses that generate substantial levels of odors. The wastewater treatment plant would be required to comply with SCAQMD Rule 402 which prohibits the creation of public nuisances due to odors. As such, the Plant would incorporate odor control systems which capture and treatment foul air associated with the treatment process. Consequently, no significant air quality impacts would occur from the development of the Arrowhead Springs Specific Plan

Without mitigation, implementation of the Arrowhead Springs Specific Plan project the following impacts would be **significant**:

AHS Impact 5.2-2 The magnitude of development and corresponding generation of air pollutant emissions would result in exceedance of the SCAQMD's construction and operational phase emissions thresholds for CO, ROG, NOx and PM_{10}.

AHS Impact 5.2-3 Emissions associated with the Arrowhead Specific Plan would exceed the SCAQMD significance thresholds during construction and operational phases. As such, the SCAQMD considers these emissions to be significant on a cumulative basis.

5.2.6 Mitigation Measures

5.2.6.1 San Bernardino General Plan

The proposed project is expected to generate emissions levels in exceedance of AQMD's threshold criteria for CO, ROG, NOx, and PM_{10} in the SoCAB, which is classified as a non-attainment area. Goals and Policies are contained in the General Plan would facilitate continued City cooperation with the SCAQMD and SCAG to achieve regional air quality improvement goals, promotion of energy conservation design and development techniques, encouragement of alternative transportation modes, and implementation of transportation

demand management strategies. In addition to these policies, the following mitigation measures shall be required to reduce air quality impacts:

GP 5.2-2A Prior to the issuance of grading permits, the property owner/developer shall include a note on all grading plans which requires the construction contractor to implement following measures during grading. These measures shall also be discussed at the pregrade conference.

- Use low emission mobile construction equipment.
- Maintain construction equipment engines by keeping them tuned.
- Utilize existing power sources (i.e., power poles) when feasible.
- Configure construction parking to minimize traffic interference.
- Minimize obstruction of through-traffic lanes. When feasible, construction should be planned so that lane closures on existing streets are kept to a minimum.
- Schedule construction operations affecting traffic for off-peak hours to minimize traffic congestion.
- Develop a traffic plan to minimize traffic flow interference from construction activities (the plan may include advance public notice of routing, use of public transportation and satellite parking areas with a shuttle service).

GP 5.2-2B The City shall promote the use of low or zero VOC content architectural coatings for construction and maintenance activities.

GP 5.2-2C The City shall reduce vehicle emissions caused by traffic congestion by implementing transportation systems management techniques that include synchronized traffic signals and limiting on-street parking.

GP 5.2-2D The City shall consider the feasibility of diverting commercial truck traffic to off-peak periods to alleviate non-recurrent congestion as a means to improve roadway efficiency.

GP 5.2-2E The City shall promote the use of fuel efficient vehicles such as fuel hybrids when purchasing vehicles for the City's vehicle fleet.

GP 5.2-3 Implementation of mitigation measures GP 5.2-2A, B, C, D and E shall be applied to reduce cumulative impacts.

5.2.6.2 Arrowhead Springs Specific Plan

AHS 5.2-2A The developer or project applicant shall use zero Volatile Organic Compounds (VOC) content architectural coatings during the construction of the project to the maximum extent feasible which would reduce VOC (ROG) emissions by 95 percent over convention architectural coatings.

AHS 5.2-2B Prior to and/or during construction operations, the property owner/developer shall implement the following measures to further reduce fugitive dust emission to the

extent feasible. To assure compliance, the City shall verify that these measures have been implemented during normal construction site inspections:

- Pave, gravel or apply nontoxic soil stabilizers on-site haul roads with 150 or more daily trips
- Phase grading to prevent the susceptibility of large areas to erosion over extended periods of time
- Schedule activities to minimize the amounts of exposed excavated soil during and after the end of work periods
- Dispose of surplus excavated material in accordance with local ordinances and use sound engineering practices
- Maintain a minimum of one-foot freeboard ratio on haul trucks or cover payloads on trucks hauling soil using tarps or other suitable means
- Install adequate storm water control systems to prevent mud deposition onto paved areas.
- Water active sites at least three times daily.

AHS 5.2-3 Implementation of mitigation measures AHS 5.2-2A and AHS 5.2-2B shall be applied to reduce cumulative impacts.

5.2.7 Level of Significance after Mitigation

5.2.7.1 San Bernardino General Plan

The policies contained in the proposed General Plan update are expected to reduce emissions associated with future development. However, even after the application of these policies and the mitigation measures listed above, implementation of the General Plan update when viewed as a whole project is expected to generate emissions levels in exceedance of AQMD's threshold criteria for CO, ROG, NOx, and PM_{10} in the SoCAB. General Plan **Impact 5.2-2** and **Impact 5.2-3** would remain significant resulting in an unavoidable adverse air quality impact due to the magnitude of emissions that would be generated during construction and operation.

5.2.7.2 Arrowhead Springs Specific Plan

The mitigation measures identified above would reduce potential impacts associated with air quality to the extent feasible. Despite the application of mitigation measures implementation of the Arrowhead Springs Specific Plan, **Impact 5.2-2** and **Impact 5.2-3** were found to result in a significant unavoidable adverse air quality impact due to the magnitude of emissions that would be generated during construction and operation. The proposed project is expected to generate emissions levels in exceedance of AQMD's threshold criteria for CO, ROG, NOx, and PM_{10} in the SoCAB.

5.3 BIOLOGICAL RESOURCES

The analysis in this section is based on information from previous technical reports, the California Natural Diversity Database (CNDDB) (U.S. Geological Survey quadrangles for Devore, San Bernardino North, San Bernardino South, Harrison Mountain and Redlands), and the California Native Plant Society (CNPS) Manual of California Vegetation and Plant Inventory.

The following technical report was used for the analysis for the Arrowhead Springs Specific Plan:

- *Biological Resources Assessment. Arrowhead Springs Specific Plan*, San Bernardino County, California, Natural Resources Assessment, Inc. November 20, 2004, Revised May 16, 2005.

A complete copy of this study is included in the Technical Appendices to this Draft EIR (Volume III, Appendix B)

5.3.1 Environmental Setting

Regulatory and Protection

Federal and State

Federal Endangered Species Act (FESA)

The Federal Endangered Species Act (FESA) of 1973, as amended was promulgated to protect and conserve any species of plant or animal that is endangered or threatened with extinction and the habitats in which these species are found. “Take” of endangered species is prohibited under Section 9 of the FESA. Take as defined under the FESA means to “harass, harm, pursue, hunt, wound, kill, trap, capture, collect, or attempt to engage in any such conduct.” Section 7 of FESA requires federal agencies to consult with the U.S. Fish and Wildlife Service (USFWS) on proposed federal actions which may affect any endangered, threatened or proposed (for listing) species or critical habitat that may support the species. Section 4(a) of the FESA requires that critical habitat be designated by the USFWS “to the maximum extent prudent and determinable, at the time a species is determined to be endangered or threatened.” Critical habitat is formally designated by USFWS to provide guidance for planners/managers and biologists with an indication of where suitable habitat may occur and where high priority of preservation for a particular species should be given. Section 10 of the FESA provides the regulatory mechanism that allows the incidental take of a listed species by private interests and non-federal government agencies during lawful activities. Habitat conservation plans (HCPs) for the impacted species must be developed in support of incidental take permits for non-federal projects to minimize impacts to the species and develop viable mitigation measures to offset the unavoidable impacts.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act of 1918 (MBTA), is the domestic law that affirms, or implements, the United States' commitment to four international conventions with Canada, Japan, Mexico and Russia for the protection of shared migratory bird resources. The MBTA governs the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts and nests. It prohibits the take, possession, import, export, transport, sale, purchase, barter, or offering of these activities, except under a valid permit or as permitted in the implementing regulations. USFWS administers permits to take migratory birds in accordance with the regulations promulgated by the MBTA.

Clean Water Act, Section 404

The United States Army Corps of Engineers (USACE) regulates discharges of dredged or fill material into "waters of the U.S."[1] (including wetlands and non-wetland bodies of water that meet specific criteria) pursuant to Section 404 of the federal Clean Water Act (CWA), a permit is required for any filling or dredging within waters of the U.S. The permit review process entails an assessment of potential adverse impacts to USACE wetlands and jurisdictional waters, wherein the USACE may require mitigation measures. Where a federally listed species may be affected, a Section 7 consultation with USFWS may be required. If there is potential for cultural resources to be present, Section 106 review may be required. Also, where a Section 404 permit is required, a Section 401 Water Quality Certification would also be required from the Regional Water Quality Control Board (RWQCB).

Clean Water Act, Section 401 and 402

Section 401(a)(1) of the CWA specifies that any applicant for a Federal license or permit to conduct any activity may result in any discharge into navigable waters, shall provide the federal permitting agency a certification from the State in which the discharge originates, that any such discharge will comply with the applicable provisions of the CWA. In California, the applicable RWQCB must certify that the project will comply with water quality standards. Permits requiring Section 401 certification include USACE Section 404 permits and National Pollutant Discharge Elimination System (NPDES) permits issued by the Environmental Protection Agency (EPA) under Section 402 of the CWA. NPDES permits are issued by the applicable RWQCB. The City of San Bernardino is within the jurisdiction of the Santa Ana RWQCB (Region 8).

California Fish and Game Code, Section 1600

Section 1600 of the California Fish and Game Code requires that a project proponent notify the California Department of Fish and Game (CDFG) of any proposed alteration of streambeds, rivers, and lakes. The intent is to protect habitats that are important to fish and wildlife. CDFG may review a project and place conditions on the project as part of a Streambed Alteration Agreement (SAA). The conditions are intended to address potentially significant adverse impacts within CDFG's jurisdictional limits[2].

California Endangered Species Act

The California Endangered Species Act (CESA) (Fish & Game Code §§ 2050, et seq.) generally parallels the main provisions of the FESA and is administered by the CDFG. Its intent is to prohibit "take" and protect state-listed endangered and threatened species of fish, wildlife, and plants. Unlike its Federal counterpart, CESA also applies the take prohibitions to species petitioned for listing (state candidates). Candidate species may be afforded temporary protection as though they were already listed as threatened or endangered at the discretion of the Fish and Game Commission. Unlike the FESA, CESA does not include listing provisions for invertebrate species. Under certain conditions, CESA has provisions for take through a 2081 permit or Memorandum of Understanding (MOU). In addition, some sensitive mammals and birds are protected by the State as Fully Protected Species. California Species of Special Concern are species designated as vulnerable to extinction due to declining population levels, limited ranges, and/or continuing

[1] "Waters of the United States" as it applies to the jurisdictional limits of the authority of the Corps of Engineers under the Clean Water Act and includes: all waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; all interstate waters including interstate wetlands; all other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce; water impoundments; tributaries of waters; territorial seas; wetlands adjacent to waters. The terminology used by Section 404 of the Clean Water Act includes "navigable waters" which is defined at Section 502(7) of the Act as "waters of the United States including the territorial seas."

[2] CDFG jurisdictional boundaries closely reflect those of the Corps, but generally cover a broader zone which commonly includes the Corps jurisdictional Ordinary High Water Mark (OHWM) but also extends across the bank to the riparian tree canopy. CDFG jurisdiction need only meet one of the three Corps criteria used to determine wetland boundaries. In additional to rivers, streams and lakes, CDFG jurisdiction may include artificial stock ponds and irrigation ditches constructed in uplands.

threats. This list is primarily a working document for the CDFG CNDDB project which maintains a database of known and recorded occurrences of sensitive species. Informally listed taxa are not protected per se, but warrant consideration in the preparation of biological resources assessments.

Local Ordinances

City of San Bernardino Municipal Code

City Ordinance MC-1027, 9-8-98 and MC-682, 11-6-89 (Municipal Code, Title 15, Chapter 15.34) prohibits the removal and/or destruction of more than five (5) trees within any thirty-six (36) month period from a development site or parcel of property without first being issued a permit from the Development Services Department. Per the ordinances, a permit shall not be required when a lawful order to remove the trees for health and safety purposes has been issued by a local, state or federal government agency; nor shall a permit be required if a removal is to be accomplished by, or under the auspices of a governmental entity.

The City's Development Code (Title 19, Land Use/Subdivision Regulations) also contains a Hillside Management Overlay District that allows for low-density residential development in the City's hillside areas. Policies of this overlay district regulate protection of the hillside's natural and topographic character, environmental, and aesthetic qualities through requirements to minimize grading and erosion effects, and preservation of slope banks, ridgelines, significant rock outcroppings, native plant materials, and natural hydrology.

Existing Conservation Plans and Areas

Critical habitat identifies specific areas, both occupied and unoccupied by a federally protected species, that are essential to the conservation of a listed species and that may require special management considerations or protection. The location of a proposed project within critical habitat typically warrants a habitat assessment, and if suitable habitat is present, focused (protocol) surveys to determine presence or absence of the listed species. Any project involving a federal agency, federal monies or a federal permit that falls within an area designated as critical habitat requires the project proponent to consult with the USFWS regarding potential impacts to the listed species and conservation measures to offset identified impacts.

Since the last update of the General Plan in 1989, the USFWS, has designated Critical Habitat for the San Bernardino kangaroo rat, (*Dipodomys merriami* parvus), coastal California gnatcatcher (*Polioptila californica californica*), and the Santa Ana sucker (*Catostomus santaanae*). The City of San Bernardino falls with the Designated Critical Habitats of the San Bernardino kangaroo rat and California gnatcatcher. Critical habitat for both species is shown in Figure 5.3-1, *Potential Habitat for Sensitive Wildlife*.

San Bernardino Kangaroo Rat Critical Habitat

The San Bernardino kangaroo rat was emergency listed as endangered on September 24, 1998, when its population had been reduced by approximately 95 percent due to habitat loss and degradation, urban development, water conservation activities and fragmentation owing to sand and gravel mining operations. The species are typically found on alluvial fans, floodplains, along washes, in adjacent upland areas, and areas with historic braided channels. Final designation of critical habitat for the San Bernardino kangaroo rat was issued in April 2002 (Department of the Interior 2002). A total of approximately of 33,295 acres in San Bernardino and Riverside Counties have been designated as critical habitat for the species. Portions of the City are located within two of four critical habitat units. The City overlays the westernmost extent of Critical Habitat Unit 1 (Santa Ana River and San Timoteo Canyon) which roughly covers the areas encompassing City Creek, Plunge Creek, and the Santa Ana River wash. It contains tributaries, flood plain terraces and active hydrological channels. Unit 2 (Lytle and Cajon Creeks) roughly covers habitat along and between Lytle

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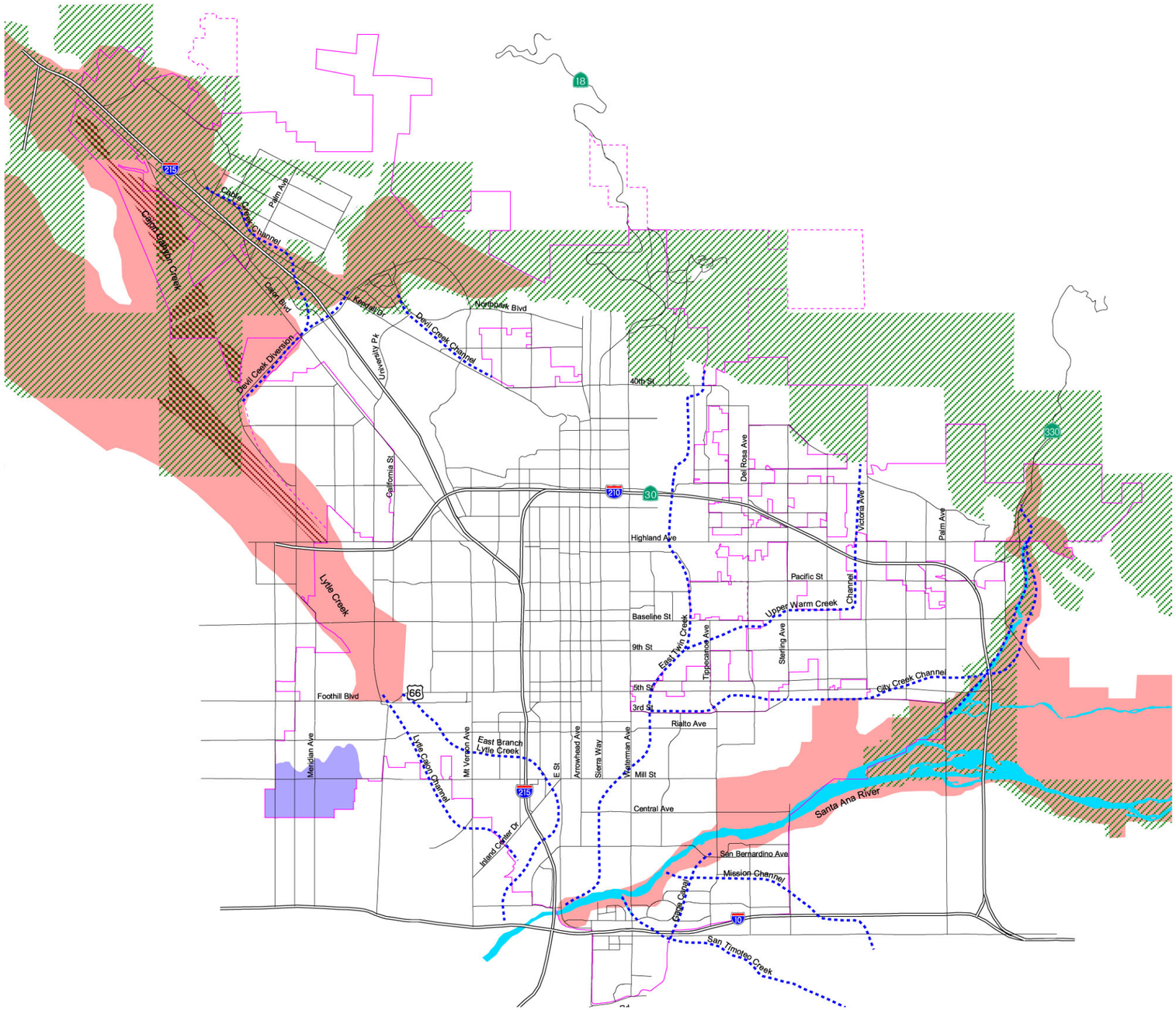
Potential Habitat for Sensitive Wildlife



- San Bernardino Kangaroo Rat Critical Habitat
- Coastal California Gnatcatcher Critical Habitat
- Cajon Creek (Cal Mat) Habitat Conservation Management Areas
- Delhi Sands Flower-loving Fly Colton Recovery Unit
- Creeks and Channels
- City Boundary
- Sphere of Influence Boundary

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and Cajon Creeks from the point that the creeks emanate from canyons within San Bernardino National Forest to flood control channels downstream. The northwesternmost portions of the City are located within Unit 2.

Coastal California Gnatcatcher Critical Habitat

The coastal California gnatcatcher is a Federally-listed threatened, State Species of Special Concern that typically occurs in or near sage scrub habitat. The species was listed as threatened in 1993. Final designation of critical habitat for the gnatcatcher was issued in October 2000 (Department of the Interior 2000). A total of approximately of 513,560 acres in Los Angeles, Orange, San Diego, San Bernardino, and Riverside Counties are designated as critical habitat for the species. Portions of the City are located within Critical Habitat Unit 11 (San Bernardino Valley MSHCP) which roughly covers approximately 58,000 acres along the foothills of the San Gabriel and San Bernardino Mountains and within the Jurupa Hills on the border of San Bernardino and Riverside counties. Undeveloped areas from the northwesternmost portion of the City to the northeasternmost portion are located within California gnatcatcher critical habitat.

Santa Ana Sucker Critical Habitat and Santa Ana Sucker (SAS) Conservation Program

Critical habitat for the Santa Ana sucker was designated January 4, 2005, by USFWS. Approximately 23,719 acres of aquatic and riparian habitats essential to the species conservation was identified. Two areas in Los Angeles County totaling 8,305 acres were designated as critical habitat units. The remaining acreage comprises “essential habitat” for the Santa Ana sucker within the Santa Ana River in Orange, Riverside, and San Bernardino Counties. However this area has been excluded in the revised final designation of critical habitat because USFWS concluded that the habitat is protected within existing programs including the Western Riverside MSHCP and the Santa Ana Sucker (SAS) Conservation Program.

The purpose of the SAS Conservation Program is to promote the conservation of the sucker, while providing the necessary authorization, to allow for the incidental take of a limited number of suckers that is anticipated to occur when the participating agencies (regional and local water and flood control districts) implement their Covered Activities. Covered Activities include operation, maintenance, repair, and reconstruction of existing projects and facilities (e.g., rebuilding existing levees for water conservation, constructed wetlands, and flood control) and the continuation of existing programs for flood control, water conservation, water treatment and discharge, protection of transportation routes, and wildlife conservation. The City of San Bernardino Municipal Water Department which operates the Rapid Extraction and Infiltration (RIX) Facility is one of seven participants in the program.

Delhi Sands Flower-loving Fly Recovery Plan

The Delhi Sands Flower-loving Fly (DSF) was federally listed as endangered in 1993. While no critical habitat has been designated for DSF, a Recovery Plan has been developed by the USFWS that details specific tasks needed to successfully recover the species. The plan defines three Recovery Units, areas that USFWS would like to preserve for the continued survival and ecological recovery of the DSF, such that protection under the FESA is no longer necessary. The south westernmost portion of the City falls within the DSF Colton Recovery Unit which is roughly bounded by Pennsylvania Road to the east; Baseline Road to the north; Cedar Avenue in Rialto to the west; and the Santa Ana River to the south. All but two of the known populations of DSF are located in this Recovery Unit. Areas within the City of San Bernardino containing Delhi sands (potential habitat for the DSF) are limited to the southwest boundary of the City, as shown in Figure 5.3-1.

Cajon Creek Conservation Banks

Within the Lytle Creek and Cajon Creek wash system in the City of San Bernardino and the SOI west of the City, the sand and gravel company, Vulcan (formerly CalMat) has established a 1,378-acre conservation site and mitigation land bank within the Riversidean alluvial fan sage scrub habitat. The conservation bank is located north of the Devil Creek Diversion Channel, south of I-215, in the Cajon wash running parallel to and

near Cajon Boulevard (see Figure 5.3-1). The Cajon Creek Conservation Bank was established to conserve populations of 24 species associated with alluvial fan scrub habitat, including the Santa Ana River woolly-star, San Bernardino kangaroo rat, and coastal California gnatcatcher.

Another 153 acres of Riversidean alluvial fan sage scrub habitat have been set aside by CEMEX (formerly Sunwest) and a 150-acre Santa Ana River Woolly-star Preserve at the southern tip of the San Bernardino County Sheriff's Training Facility have been set aside as conservation lands within the Lytle Creek/Cajon Creek wash area. In addition, the County of San Bernardino will be establishing a conservation area/ mitigation bank in Riversidean alluvial fan sage scrub habitat in the Cajon Wash on the east side of the Glen Helen Regional Park. Lands within and around these conservation lands and mitigation banks are available to offset impacts to sensitive biological resources.

Proposed Conservation Plans and Areas

Habitat Conservation Plans/Natural Community Conservation Plans

Under Section 10 of the FESA, an incidental take permit from the USFWS is required when non-Federal activities will result in "take" of threatened or endangered wildlife. A Habitat Conservation Plan (HCP) must accompany an application to the USFWS for an incidental take permit. If the USFWS accepts the HCP, then the agency issues the permit," which allows permittees to "take" an endangered species if such taking is incidental to, and not the primary purpose of, the proposed activity. The permit is required prior to developing any part of an endangered species' habitat because USFWS regulations equate habitat modification with taking an endangered species, which is prohibited under federal law.

The purpose of the HCP planning process is to ensure there is adequate minimizing and mitigation of the effects of the authorized incidental permit. The Natural Community Conservation Planning (NCCP) program is an unprecedented, federal, state, and local cooperative effort that takes a broad-based ecosystem approach to planning for the protection and perpetuation of biological diversity. Rather than identify and protect individual species that have already declined in number significantly, an NCCP provides for the regional or area wide protection of plants, animals, and habitats at the ecosystem scale, while accommodating compatible and appropriate land use. A local agency (such as a City, County, or District) coordinates with USFWS, CDFG, and other parties to the collaborative planning process to develop a conservation plan.

An HCP/NCCP is intended to standardize and streamline the existing permitting process for incidental take of listed species under FESA for the participating entity(s). Upon granting of Take Approval from the USFWS, the participating entity(s) assumes the Service's permitting responsibilities for proposed projects that would potentially take "Covered Species." Covered Species includes species currently listed as threatened or endangered and certain species that may become listed during the term of the HCP/NCCP. Mitigation/ compensation measures established under an HCP/NCCP would concurrently satisfy applicable provisions of the FESA and CESA. In general, an HCP/NCCP would require the County and cities to collect local development mitigation fees, negotiate with developers to site projects thorough a land exchange/dedication process; comply with the plan's policies designed to protect species; contribute to the assembly of a Reserve through the regular land use process and other means; and enforce project conditions to ensure compliance with the HCP/NCCP.

San Bernardino Valley Wide Multi-Species Habitat Conservation Plan

Presently, there is no approved HCP/NCCP plan for the valley portion of San Bernardino County. The San Bernardino Valley-wide Multi Species Habitat Conservation Plan (MSHCP) is currently in preparation. The proposed MSHCP encompasses approximately 500 square miles containing six unlisted species, six state-listed endangered or threatened species, and thirteen federally-listed endangered threatened species, and 53 species of special concern. San Bernardino County, through the San Bernardino County Museum staff, has been conducting biological and botanical surveys for several years in order to identify habitat needs and

requirements for the various species. The schedule for completion and adoption of the SBVMSHCP is uncertain at this time. Completion of the plan is not expected anytime within the near future. The City participated in previous planning efforts, with the intent to be a Local Permittee upon adoption of the plan. should work on the MSHCP resume, the City would reevaluate merits of participation.

Upper Santa Ana River Wash Land Management and Habitat Conservation Plan

Landowners, land managers, regulatory agencies and interested stakeholders have been meeting over the past several years to develop a consensus-based land use strategy for the Santa Ana River alluvial fan, which supports most of the remaining stands of Santa Ana River woolly-star (*Eriastrum densifolium spp*. sanctorum), slender-horned spineflower (*Dodecahema leptoceras*), and other rare plant and animal species. The aim of this effort is to develop a reserve design and conservation plan that protects the most important habitat areas while consolidating sand and gravel extraction and water spreading activities. The proposed Upper Santa Ana River Wash Land Management and Habitat Conservation Plan for the upper Santa Ana Wash involves an area of approximately 4,365 acres located in the upper Santa Ana River Wash area. The planning area begins at the mouth of the Santa Ana canyon at Greenspot Road, one mile downstream from the Seven Oaks Dam, and extends west westward for approximately six miles to Alabama Street. It would also contain the existing Woolly Star Preservation Area (WSPA) preserved by the USACE and 3 flood control districts; and the BLM's Santa Ana River Area of Critical Concern/Research Natural Area (ACEC/RNA). Final boundaries of the conservation area have not yet been determined[3]. At this time, the proposed conservation area appears to be just outside of and adjacent to the current City of San Bernardino limits just southeast of the San Bernardino International Airport.

5.3.1.1 San Bernardino General Plan Update

Methodology

The following assessment of biological resources is based on historical information compiled through previous documentation and appropriate reference materials. Previous studies have been incorporated by reference and summarized. No updated surveys were done city-wide.

Plant Communities/Habitat

The City of San Bernardino is located in the valley and upland region of San Bernardino County and has been largely disturbed by urban and agricultural uses. The City is surrounded on three sides by other developed cities including Highland to the east, Colton, Loma Linda, and Redlands to the south, and Rialto to the west. The northernmost parts of the City, including lands within the SOI and Arrowhead Springs Specific Plan, lie within the foothills and mountains of the San Bernardino Mountain range and are bound by the San Bernardino National Forest. In the developed portions of the City, there are few remaining areas of natural habitat. Open space consists primarily of developed parks, recreation areas, and golf courses. These areas mostly contain non-native species of plants and animals, while the northern portions of the City contain the majority of the City's significant biological resources. Figure 5.3-2, *Biological Resource Areas*, shows the general areas where biological resources, including riparian corridors, may be present.

[3]San Bernardino Valley Water Conservation District. Personal communication with Walter Christensen, Project Manager, April 27, 2005.

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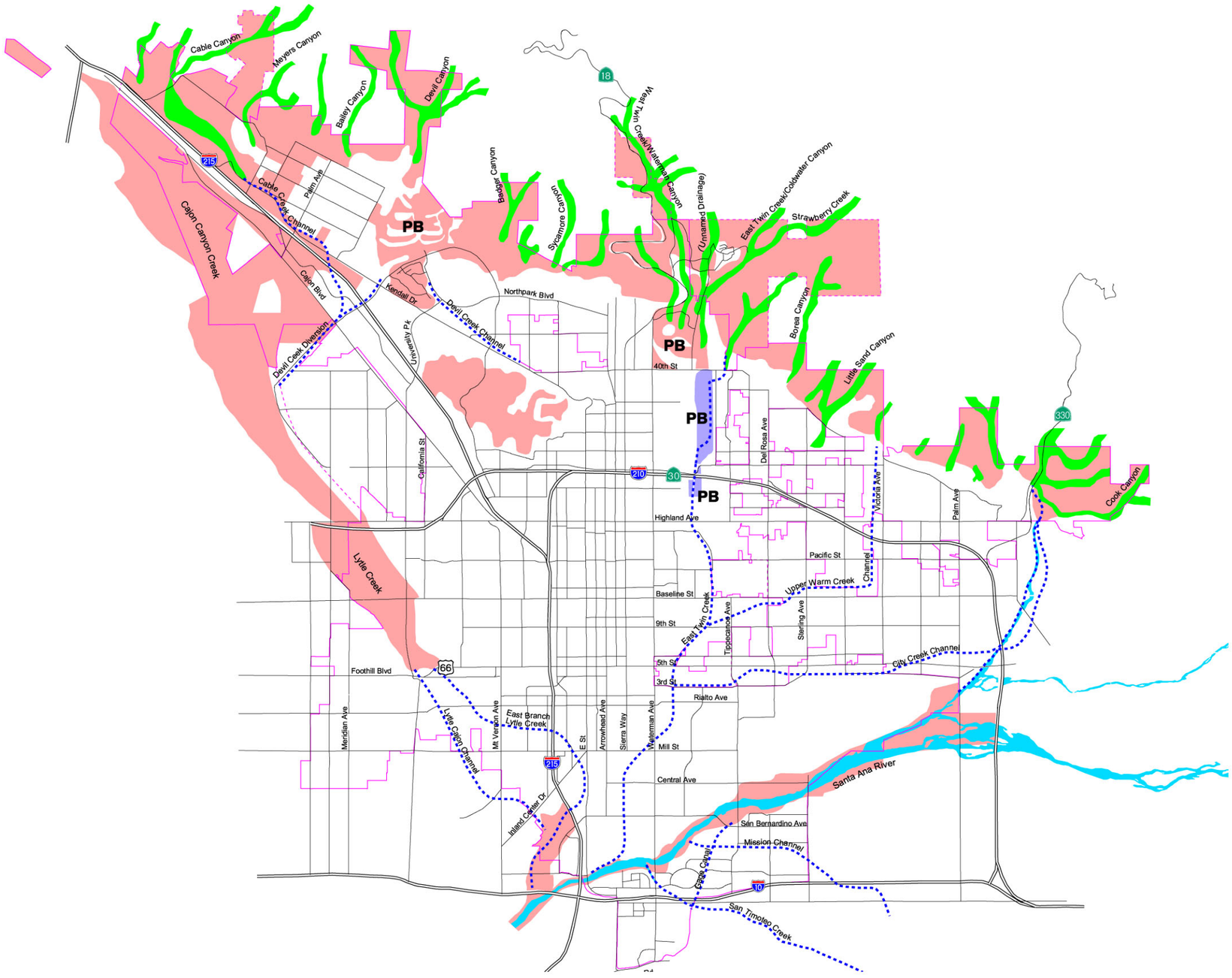
Biological Resource Areas



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The majority of the City lies on broad, sloping lowlands along the southwest margins of the San Bernardino Mountains. The lowland is underlain by alluvial sediments eroded from bedrock in the mountains and washed down into the valley by rivers and creeks. Alluvial fans and floodplains of the valley floor support distinctive alluvial scrub and alluvial fan scrub vegetation. Upland areas support inland coastal sagebrush scrub vegetation. Above the valley floor and uplands are deep canyons which support riparian and oak woodland habitats and riparian forest. Broad canyons and mountain slopes of the foothills support chaparral and woodland vegetation. Disturbed and developed areas of the City support non-native annual grasslands.

The City of San Bernardino contains plant communities that range from disturbed and ornamental plant communities in the urbanized portions of the City to native plant communities along the northern portions of the City along the base of the foothills and in the mountains. Plant communities within the City and SOI include the following:

Coastal Sage Scrub

Coastal sage scrub communities consist of drought-deciduous, low, soft-leaved shrubs and herbs on gentle to steep slopes below 3,000 feet in elevation. Coastal sage-chaparral scrub is found on upland slopes, typically south-facing. It is often considered part of a collection of series referred to as coastal scrub. Dominant shrub species include California sagebrush, California brittlebush, and California buckwheat. Other species may include deerweed and white sage, black sage, and chamise. Several dominant species occur within coastal sage scrub communities and some areas may be overwhelmingly dominated by one or two species. In addition, several coastal sage scrub communities support representative dominant species of two separate communities and are designated as such. Coastal sage scrub communities within the planning area may include buckwheat scrub, coastal sage-chaparral scrub, Riversidean sage scrub, and Riversidean alluvial fan sage scrub. Coastal sage scrub is present on the hillsides surrounding drainages. Riversidean alluvial fan sage scrub habitat dominates the Santa Ana River flood plain that traverses the southern portion of the City.

Chaparral

Chaparral communities consist of evergreen, medium height to tall sclerophyllous (woody with leathery leaves) shrubs that form a dense cover on steep slopes. The dense, almost impenetrable, cover allows very little to no understory growth and usually consists mostly of leaf litter. Chaparral is an upland habitat and is found mainly on the upper slopes and higher elevations in the mountain ranges in the northern portion of the City. Dominant species include chamise, buckwheat species, chaparral whitethorn and yucca. Common species may include hoaryleaf ceanothus, mountain mahogany, and coast live oak. The type of chaparral community depends upon the dominant species. Chaparral communities found within the planning area may include chamise chaparral, scrub-chaparral, mixed chaparral, and soft chaparral.

Riparian

Riparian communities occur along water courses or water bodies adaptable to seasonal flooding. Structurally, riparian areas may range from a dense canopy of large trees with a bramble/thicket understory within a steep canyon, to open, lower-growing species within a sandy wash. Riparian plant species include willows, Fremont's cottonwood, sycamore, white alder, California walnut, mulefat, and broad-leaved cattail. Herbaceous species include red monkeyflower, California mugwort, white-flowered deadly nightshade, croton, and poison oak Shrubs along the canyon sides include mountain mahogany, California brickellia, and hoaryleaf ceanothus. California bay and coast live oak are occasionally found in these communities. Riparian communities may include southern willow scrub and mule fat scrub. Riparian communities may also include riparian woodland and forest communities described below.

Woodland

Woodland communities are associated with multi-layered vegetation canopies ranging from open, to moderately dense cover and have a tree canopy that is at least 20 percent open. Woodland habitats are often associated with watercourses and riparian communities. Within the planning area, stands of riparian woodlands primarily occur within the major drainage courses in the northern portion of the City and may include southern sycamore-alder riparian woodland, sycamore willow woodland, and California walnut *woodland.*

Forest Communities

Forest communities consist of multi-layered vegetation that forms a dense canopy cover that is almost completely closed. The ground layer of plants is sparse or absent. Forest communities may occur in stream benches and terraces, and canyon bottoms near streams. Within the planning area forest communities may include southern coast live oak riparian forest, southern cottonwood-willow riparian forest, white alder riparian forest, and lower montane coniferous forest. Southern coast live oak riparian forest may be dominated by coast live oak, Englemann oak, and California bay. Southern cottonwood-willow riparian forest community consists of tall, open, broadleafed winter-deciduous riparian forests dominated by Fremont cottonwood and several tree willows. Understories are usually shrubby willows. Lower montane coniferous forest is dominated by Coulter pine, manzanita, coast live oak, and occasional stands of scrub oak.

Annual Grasslands [Valley and Foothill Grasslands]

This extensive collection of series (including Annual Grasslands and several Needlegrass Grasslands) is composed of many alien and native annual species. Composition varies among stands and many species beyond those typically listed may also be present. Species include ripgut brome, soft chess, foxtail chess, filarees, common goldfields, lupine, wild oats, and Italian rye-grass. Stands of once extensive series of valley needlegrass grasslands now typically include non-native annual species mixed with the perennial grasses and herbs. Foothill needlegrass, nodding needlegrass, and purple needlegrass occur sympatrically, but do not typically mix. The non-native annual grassland areas are typically disturbed or graded areas and vacant lots that have revegetated with opportunistic weedy species.

Ornamental Woodland

Ornamental woodlands are created woodlands using non-native trees and shrubs. Common species of trees found within ornamental woodlands throughout the City of San Bernardino include various species of eucalyptus tree, tamarisk and Peruvian pepper trees. Ornamental woodlands often provide excellent nesting habitat for raptors and other birds. Ornamental woodlands also provide shade, wind protection, erosion control and aesthetic value to people. Scattered ornamental woodlands and windrows exist throughout the City.

Developed/Disturbed

Although most of the land within the City limits supported coastal sage and alluvial communities at one time, much of the land today is either developed or has been extensively modified by human activity sometime in the recent past. Development includes any form of human disturbances, especially in cases of permanent impacts to natural communities. Disturbed areas would include dirt roads, off-highway use, pavement, concrete, buildings and structures, bridges, active agricultural activities, and permanent flood control measures. Fallow agricultural areas are in various stages of succession and are covered with non-native grasslands, emergent native vegetation and exotics. These areas may provide suitable habitat for the San Bernardino kangaroo rat, a federally endangered species of rodent. In developed areas, native species have been replaced by landscaping or a variety of annual grasses. The non-native annual grass species found include a variety of bromes, Bermuda grass and the large Johnston grass. Non-native tree clusters and

windrows are also located within the developed portions of the City, consisting of large eucalyptus, California pepper, and olive trees and oleander. In disturbed areas ruderal species consist of weedy grasses such as red brome and Mediterranean grass, and weedy forbs such as short-podded mustard, Russian thistle, and tocalote. Native species may include California croton, deerweed and scalebroom, and doveweed.

Non-native Landscaping

Non-native landscaping includes palms, blue gum [eucalyptus], Peruvian pepper tree, non-native oaks, pines, fruit trees, olive, and other landscape trees and shrubs.

Animals

The vegetation communities within the City of San Bernardino provide habitat for a wide variety of animal species. Common birds in the area include the roadrunner, horned lark, scrub jay, plain tit-mouse, verdin, wrentit, Bewick's wren, California thrasher, American goldfinch, Brown California towhee, lesser goldfinch, and song sparrow. Raptors and owls exist in some of the open areas of the City.

Within the City limits, common mammal species are limited to those that have adapted to or can coexist with humans, such as pocket gophers, California ground squirrels, desert cottontail rabbits, striped skunk, and opossum. Smaller mammals still persist in the streamside woodland areas within the northern limits of the City and the SOI. Pocket gopher, California pocket mouse, kangaroo rats, various white-footed mice, California vole, black-tail jackrabbit, brush rabbit, and cottontail rabbit are typically found in undisturbed areas containing RAFSS. Moderate size mammals such as spotted striped skunk, Gray squirrel, opossum, raccoon, bobcat, and gray fox are typically found in the mixed chaparral habitat located in the northern areas of the City. Very few large mammals, such as black bear, mountain lion, and mule deer occur within the City limits, but have been observed in the mountainous areas north of the City.

Sensitive Resources

Sensitive Plant Communities/Habitat

Portions of the City support habitat types considered sensitive by resource agencies, namely the CDFG, due to their scarcity and ability to support a number of State and Federally-listed endangered, threatened, and rare vascular plants, and sensitive wildlife species. The CNDDB reports the occurrence of sensitive biological elements, including sensitive plant and animal species, and vegetation communities within and in the vicinity of Highland. The primary purpose of the CNDDB classification is to assist in the location and determinations of significance and rarity of various vegetation types. Thus, ranking of natural communities by their rarity and threat is an important facet of the classification. The CNDDB community lists, notes rare communities that are either known or believed to be of high priority for inventory in CNDDB. Sensitive vegetation communities (i.e., "high priority" habitat types) that are known or may occur within the San Bernardino planning area include the following:

- Valley Needlegrass Grassland
- Wildflower Field (California Annual Grassland Series)
- Riversidean Alluvial Fan Sage Scrub
- Southern Willow Scrub
- Southern Coast Live Oak Riparian Forest
- Southern Cottonwood-Willow Riparian Forest
- Southern Riparian Forest
- White Alder Riparian Forest
- Southern Sycamore-Alder Riparian Woodland

- California Walnut Woodland
- Freshwater Seep

Sensitive Plant Species

Sensitive plants include those listed, or are candidates for listing, by the USFWS, CDFG, and CNPS. The sensitive plant species listed in Table 5.3-1 were reported in the CNDDB) from the Harrison Mountain, Redlands San Bernardino South, and Yucaipa USGS quadrangles and potentially occur within or in the vicinity of the City.

Table 5.3-1
Sensitive Plant Species Potentially Present in the City of San Bernardino and Vicinity

Scientific Name	Common Name	Federal/State Status	CDFG or CNPS
Arenaria paludicola	Marsh sandwort	END/END	1B
Berberis nevinii	Nevin's barberry	END/END	1B
Brodiaea filifolia	Thread-leaved brodiaea	THR/END	1B
Carex comosa	Bristly sedge	None/None	2
Centromadia pungens ssp. laevis	Smooth tarplant	None/None	1B
Calochortus plummerae	Plummer's mariposa lily	None/None	1B
Chorizanthe parryi var. parryi	Parry's spineflower	None/None	3
Chorizanthe xanti var. leucotheca	White-bracted spineflower	None/None	1B
Cordylanthus maritimus ssp. laevis	Salt marsh bird's-beak	END/END	1B
Dodecahema leptoceras	Slender-horned spineflower	END/END	1B
Dudleya multicaulis	Many-stemmed dudleya	None/None	1B
Eriastrum densifolium spp. sanctorum	Santa Ana River woollystar	END/END	1B
Fimbristylis thermalis	Hot springs fimbristylis	None/None	2
Galium californicum ssp. primum	California bedstraw	None/None	1B
Helianthus nuttallii ssp. parishii	Los Angeles sunflower	None/None	1A
Horkelia cuneata ssp. puberula	Mesa horkelia	None/None	1B
Lepidium virginicum var. robinsonii	Robinson's pepper-grass	None/None	1B
Lilium parryi	Lemon lily	None/None	1B
Lycium parishii	Parish's desert-thorn	None/None	2
Monardella pringlei	Pringle's monardella	None/None	1A
Ribes divaricatum var. parishii	Parish's gooseberry	None/None	1B
Rorippa gambelii	Gambel's water cress	END/THR	1B
Schoenus nigricans	Black sedge	None/None	2
Sidalcea neomexicana	Salt Spring checkerbloom	None/None	2
Theylypteris puberula var. sonorensis	Sonoran maiden fern	None/None	2

FED: Federal Classifications
END Taxa listed as endangered
THR Taxa listed as threatened
PE Taxa proposed to be listed as endangered
PT Taxa proposed to be listed as threatened
C2* USFWS may, in the future, designate such taxa as Candidates. (*) indicates C2 candidates that were removed from the list.
C Candidate for listing.
None Not designated as a sensitive species

STATE: State Classifications
END Taxa listed as endangered
THR Taxa listed as threatened
CE Candidate for endangered listing
CT Candidate for threatened listing
SC California Species of Special Concern.
None Not designated as a sensitive species

Table 5.3-1
Sensitive Plant Species Potentially Present in the City of San Bernardino and Vicinity

CNPS: California Native Plant Society Classifications

1A	Plants presumed by CNPS to be extinct in California
1B	Plants considered by CNPS to be rare or endangered in California and elsewhere
2	Plants considered by CNPS to be rare, threatened or endangered in California, but which are more common elsewhere
3	Review list of plants suggested by CNPS for consideration as endangered but about which more information is needed.
4	Watch list of plants of limited distribution whose status should be monitored.

Source: California Natural Diversity Database, April 2005, Devore, San Bernardino North, San Bernardino South, Harrison Mt. quadrangles.

Sensitive Wildlife

Sensitive wildlife includes those species listed as endangered or threatened under the FESA or CESA, as candidates for listing and species of special concern by the USFWS and CDFG, and fully-protected species. A number of sensitive wildlife species from the region were reported in the CNDDB and are listed in Table 5.3-2 below. Several raptor species that may be migrants to the general area are also considered sensitive and are included.

Table 5.3-2
Sensitive Animal Species Potentially Present in the City of San Bernardino and Vicinity

Scientific Name	Common Name	Federal/State Status
INSECTS		
Raphiomidas terminatus abdominalis	Delhi Sands flower-loving fly	END/None
FISH		
Catostomus santaanae	Santa Ana sucker	THR/SC
Rhinichthys osculus ssp. 3	Santa Ana speckled dace	None/SC
AMPHIBIANS		
Batrachoseps gabrieli	San Gabriel slender salamander	None/None SA
Rana aurora draytonii	California red-legged frog	THR/SC
Rana muscosa	Mountain yellow-legged frog	END/SC
REPTILES		
Aspidoscelis hyperythra	Orange-throated whiptail	None/SC
Charina bottae umbratica	Southern rubber boa	None/THR
Lampropeltis zonata parvirubra	San Bernardino mountain kingsnake	None/SC
Phrynosoma coronatum blainvillei	Coast (San Diego) horned lizard	None/SC
BIRDS		
Accipiter cooperii	Cooper's hawk	None/SC
Accipter striatus	Sharp-shinned hawk	None/SC
Aimophila ruficeps canescens	Southern California rufous-crowned sparrow	None/SC
Aquila chrysaetos	Golden Eagle	None/SC, CFP
Athene cunicularia	Burrowing owl	None/SC
Buteo swainsoni	Swainson's hawk	None/THR
Circus cyaneus	Northern Harrier (Marsh hawk)	None/SC
Coccyzus americanus occidentalis	Western yellow-billed cuckoo	C/END
Eremophila alpestris actia	California horned lark	None/SC
Falco columbarius	Merlin	None/SC
Falco mexicanus	Prairie Falcon	None/SC
Falco peregrinus anatum	American peregrine falcon	None (Formerly END)/END, CFP
Polioptila californica californica	Coastal California gnatcatcher	THR/SC
Vireo bellii pusillus	Least Bell's vireo	END/END

Table 5.3-2
Sensitive Animal Species Potentially Present in the City of San Bernardino and Vicinity

Scientific Name	Common Name	Federal/State Status
MAMMALS		
Chaetodipus fallax fallax	Northwestern San Diego pocket mouse	None/SC
Dipodomys merriami parvus	San Bernardino kangaroo rat	END/SC
Dipodomys stephensi	Stephen's kangaroo rat	END/THR
Neotoma lepida intermedia	San Diego desert woodrat	None/SC
Onychomys torridus Ramona	Southern grasshopper mouse	None/SC
Eumops perotis californicus	Western mastiff bat	None/SC
Lasiurus xanthinus	Western yellow bat	None/None
Perognathus longimembris brevinasus	Los Angeles pocket mouse	None/SC

FED: Federal Classifications
- END Taxa listed as endangered
- THR Taxa listed as threatened
- PE Taxa proposed to be listed as endangered
- PT Taxa proposed to be listed as threatened
- C2* USFWS may, in the future, designate such taxa as Candidates. (*) indicates those C2 candidates that were removed from the list.
- C Candidate for listing.
- None Not designated as a sensitive species

STATE: State Classifications
- END Taxa listed as endangered
- THR Taxa listed as threatened
- CE Candidate for endangered listing
- CT Candidate for threatened listing
- CFP California Fully Protected
- SC California Species of Special Concern.
- SA Special Animal. Taxa of concern to the CNDDB regardless of their current legal or protected status.
- None Not designated as a sensitive species

Source: California Natural Diversity Database, April 2005, Devore, San Bernardino North, San Bernardino South, Harrison Mt. quadrangles.

Wildlife Corridors

Historically, the land within the City of San Bernardino provided movement in both north-south and east-west directions, and provided a connection between the nearby San Bernardino Mountains to the valley floor. Currently, the City is mostly developed, with most of the land converted from open space areas to commercial, industrial, residential, and recreational uses. Wildlife movement on a north-south regional basis has ceased due the development of the valley floor. Major wildlife movement within the City is not likely to occur. Regional wildlife movement in an east-west orientation in the mountains and along the undeveloped foothills northeast of I-215 and north of SR 30/I-210 may still provide viable wildlife corridors.

Wildlife corridors within the City and SOI areas are most likely limited to the northern undeveloped portions of the City. Cajon Canyon, Lytle Creek Wash may also serve as potential movement corridors, but to a lesser extent, as portions of the channels have been modified by aggregate extraction activities. East-west corridors may exist along the Santa Ana River although large portions of the wash have also been modified for flood control and water conservation facilities, and by active aggregate mining activities. Local wildlife corridors are likely to occur within the canyons and washes in the foothills and mountains north of the City.

Jurisdictional Waters and Wetlands

The lateral limit of USACE jurisdiction extends to the Ordinary High Water Mark (OHWM) and to any wetland areas extending beyond the OHWM. Wetlands are based on the hydrologic characteristics, vegetation, and soil conditions of the site. Non-wetland waters of the U.S. are based on the limits of the OHWM. CDFG jurisdiction is defined to the banks of the stream or channel. Lateral limits of jurisdiction are not clearly defined, but generally include any riparian resources associated with a stream or lake.

The City of San Bernardino contains three large watercourses determined to be "waters of the U.S." that traverse portions of the City as tributaries within the Santa Ana watershed (see Figure 5.3-2). The northwestern and western boundary of the City approximately parallels and encompasses portions of Cajon Canyon Wash and Lytle Creek Wash. The Santa Ana River and wash bounds and traverses through the

southeastern portion of the City. Several blue line streams flow within canyons through the mountains and foothills of the San Bernardino Mountains from the north including:

- Cable Canyon
- Meyers Canyon
- Bailey Canyon
- Devil Canyon
- Badger Canyon
- Sycamore Canyon
- West Twin Creek/Waterman Canyon
- East Twin Creek/Coldwater Canyon
- Strawberry Creek
- Borea Canyon
- Little Sand Creek
- Sand Creek/Sand Canyon
- City Creek, Cook Canyon

Various unnamed canyons and drainages also emanate from the foothills and drain toward the valley and the City. Riparian resources, including wetlands that occur along these drainages potentially fall under the jurisdiction of the USACE and CDFG. The east branch of the State Water Project California Aqueduct also traverses the northwestern portion of the City. Several tributaries, including East Twin Creek, Warm Creek, Lytle Creek, and City Creek traverse the urbanized portions of the City as flood control channels and canals. Within the developed area of the northwest portion of the City are features that have been modified for flood control, including reservoirs, flood control basins, and percolation basins constructed to receive flow from drainages including Devil Canyon, Bailey Canyon, West Twin Creek, and East Twin Creek, are also located throughout the City.

5.3.1.2 Arrowhead Springs Specific Plan

Methodology

The Biological Resources Assessment, Arrowhead Springs Specific Plan (NRA, Inc. 2005) report was prepared based on information complied through field investigations, previous documentation, and appropriate reference material for biological resources in the project area and adjacent areas including the CNDDB. The surveys included vegetation and habitat classification, a general plant inventory, sensitive plant surveys, general wildlife inventory of wildlife, a wildlife corridor and sensitive species assessment. A detailed description of survey methodologies can be found in the biological resources assessment (Appendix B, Volume III).

A database search was conducted for sensitive biological resources occurring on the San Bernardino North, San Bernardino South, Devore, and Harrison Mountain 7.5-minute topographic quadrangle maps. Sensitive species potentially present include those listed, or candidates for listing by USFWS, CDFG and the CNPS. All sensitive species were considered as potentially present on the project site if its known geographical distribution encompassed all or part of the project area; or if its distribution was near the site and its general habitat requirements were present.

Biological resources assessment surveys were conducted by NRA, Inc. on November 9 and 10, 2004. The surveys combined walking and driving surveys of the property, focusing on areas proposed for development. The surveys included the use of binoculars to aid in the identification of birds, as well as plant species on inaccessible hillsides. All species identified by sight, call or sign (burrows, scat, tracks, etc.) were recorded. Site photographs were also taken. Existing conditions within the site were recorded, paying specific attention to habitats that may potentially contain sensitive species.

An assessment of wetlands and non-wetlands waters within the project site was also conducted to determine onsite drainages that are potentially subject to jurisdiction of the USACE and/or the CDFG and to identify any areas that were determined to fall under these jurisdictions. A formal delineation for the drainages present on the site was not conducted. The results of the jurisdictional assessment are included in the biological assessment report (Volume III, Appendix B).

Plant Communities/Habitat

A map of the existing habitats and vegetation communities is shown in Figure 5.3-3, *Plant Communities, Arrowhead Springs Specific Plan*. Table 5.3-3 provides the acres of the plant communities within the property boundaries.

Table 5.3-3
Plant Communities in the Arrowhead Springs Specific Plan Area

Plant Community	Acreage
#1 Annual Grassland (AG/S)	258.7
#11 Vacated Residential Development (VRD)	39.2
#2 Chamise Chaparral (CHA)	263.5
#3 Chaparral (CHP)	914.3
# 4 Disturbed (DIST)	35.5
#5 Deerweed Scrub (DS)	82.3
#6 Landscape (LS)	133.9
#12 Cattail Marsh (MARSH)	2.3
#7 Lower Montane Coniferous Forest (MON)	38.8
#13 Pond (POND)	2.2
#8 Sycamore Alder Woodland (SAW)	40.0
#9 Southern Willow Riparian (SWR)	20.0
#10 Sycamore Willow Woodland (SWW)	48.4
Unclassified Non-Native [Landscape]*	21.1
TOTAL	1900.2

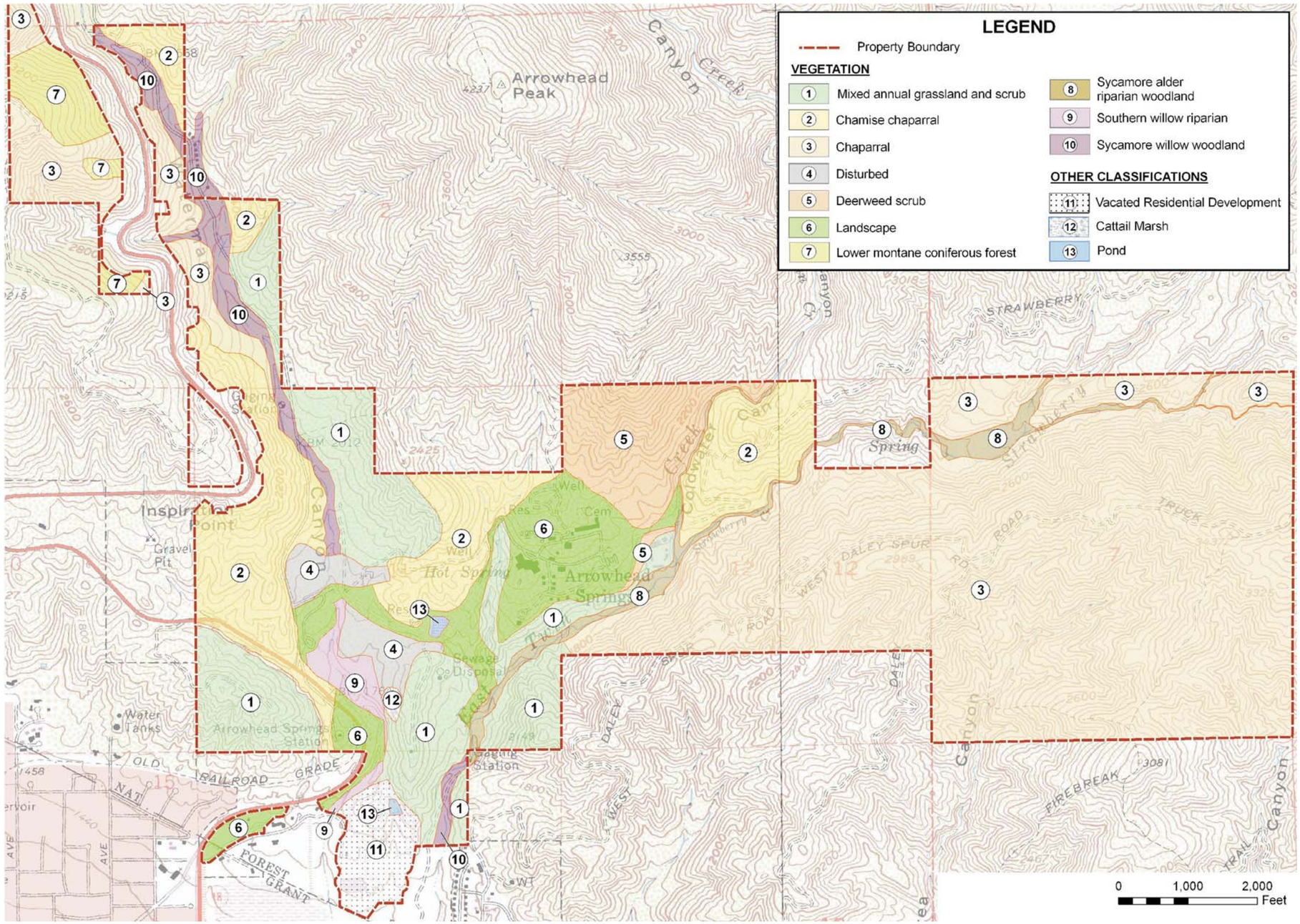
Note: Number corresponds to number on Figure 5.3-3
* Classification is included in #6 on Figure 5.3-3

Soils on the property include Soboba stony loamy sandy soils in the drainages and a mix of Soboba stony loamy sandy soils and Hanford coarse sandy loams on the hillsides.

Portions of the project site are developed. Former land use included a spa, hotel, recreational center, and bungalow-type residential units. Current use of the property is limited to the office buildings, village complex, conference room, and maintenance/support buildings. Prior disturbances within the project site include the construction and use of the Arrowhead Springs Hotel and Spa, roads and infrastructure. Current disturbances include the loss of scrub on the south, east, and west portions of the site from wildfires, and grading and drilling being conducted by the Metropolitan Water District (MWD) Tunnel Project in West Twin Creek/Waterman Canyon near the main entrance to the project site. Land uses south of the Arrowhead Springs project site include percolation and spreading basins for the water from East Twin Creek and West Twin Creek/Waterman Creek, and residential uses. Open space occurs on the east, west and north.

The Arrowhead Springs Specific Plan site contains the following plant communities:

Plant Communities - Arrowhead Springs



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Mixed Annual Grassland and Scrub. Dominant annual species in this habitat include various brome grasses (*Bromus madritensis*, *Bromus diandrus*, and *Bromus tectorum*), Mediterranean grass, and herbaceous species such as short-podded mustard and doveweed. The dominant scrub species in this plant community is California buckwheat (*Eriogonum fasciculatum*), and deerweed (*Lotus scoparius*). Herbaceous species include short-podded mustard, branching phacelia (*Phacelia ramossisima*) and cotton thorn (*Tetradymis comosa*). In some areas (especially those subjected to frequent burning), this community is dominated by grasses and deerweed. This plant community frequently intergrades with chamise chaparral. Most of the lower slopes of the foothills are covered with a mix of annual grassland and scrub, including the Steam Caves drainage.

Deerweed Scrub. This plant community is dominated by deerweed, weedy grasses, and herbaceous species. Almost no other scrub plant occurs in this community. Deerweed scrub is not a true native southern California plant community. It indicates that the native scrub habitat has been recently disturbed (usually burned) with the result that deerweed becomes the dominant shrub. This plant community is found only in the central area north of the landscaped grounds, including the area north of East Twin Creek.

Chamise Chaparral. The chamise chaparral on site is dominated by chamise (*Adenostoma fasciculatum*), but includes some coastal sage scrub species such as California buckwheat, deer weed and white sage (*Salvia apiana*). Other species found in soft chaparral include buckbrush (*Ceanothus cuneatus*), yerba santa (*Eriodictyon trichocalyx*), Whipple's yucca (*Yucca whipplei*) and black sage (*Salvia mellifera*). Scrub oak (*Quercus berberidifolia*) is sometimes found in this plant community. Herbaceous species include wishbone bush (*Mirabilis californica*) and wild cucumber (*Marah macrocarpa*) on dry slopes. Poison oak (*Toxicondendron diversilobum*) occurs in more moist sites. On the Arrowhead Springs property, chamise chaparral is found on dry slopes, often intermixed with the mixed annual grassland and scrub plant community. Chamise chaparral also occurs along upper West Twin Creek/Waterman Canyon, and is particularly extensive along the western side of the canyon.

Chaparral

Chaparral is found mainly on the upper slopes and higher elevations in the mountain ranges. Common species include hoaryleaf ceanothus (*Ceanothus crassifolius*), mountain mahogany (*Cercocarpus betuloides*), and coast live oak (*Quercus chrysolepis*). Within the project area, chaparral stands are scattered on upper mountainsides, particularly along the upper East Twin and Strawberry Creek canyon area, and in the upper reaches of West Twin Creek/Waterman Canyon.

Riparian Woodlands

Riparian areas occur along main drainages of the site (East Twin Creek, Strawberry Creek, West Twin Creek/Waterman Canyon), and an unnamed drainage to the west of State Route 18) and include sycamore alder woodland, and sycamore willow woodlands.

East Twin Creek and Strawberry Creek support sycamore alder woodland habitat consisting of riparian tree and scrub species, such as white alder (*Alnus rhombifolia*), black willow (*Salix gooddingii*), sycamore (*Platanus racemosa*), and California walnut (*Juglans californica*). What appears to be cultivated fig is also found in these drainages. The understory in East Twin Creek is mostly made up of herbaceous species such as red monkeyflower (*Mimulus cardinalis*), California mugwort (*Artemisia douglasiana*), white-flowered deadly nightshade (*Solanum dougliasiana*), and poison oak (*Toxicodendron deversilobum*). Shrubs along the canyon sides include mountain mahogany, California brickellia (*Brickellia californica*), and hoaryleaf ceanothus.

Further downstream, near the junction with West Twin Creek, alders disappear and the stand becomes sycamore willow woodland. Riparian woodland in West Twin Creek/Waterman Canyon ranges from open to moderately dense cover. Tree species include red willow (*Salix laevigata*), arroyo willow (*Salix lasiolepis*),

sycamore, and California walnut. California bay (*Unbellularia californica*) and coast live oak trees are occasionally found on the upper hillsides of West Twin Creek/Waterman Canyon. The understory in West Twin Creek/Waterman Canyon is limited, formed mostly by herbaceous species such as croton (*Croton californica*), poison oak, and non-native grasses.

The unnamed drainage is dominated by sycamore and red willow, with at least one tamarisk (*Tamarix* sp.) present. The herbaceous understory is dominated by non-native grasses and a dense stand of short-seeded ryegrass (*Leymus condensatus*).

Southern cottonwood willow riparian forest and Southern mixed riparian forest were not found during the field surveys.

Lower Montane Coniferous Forest

Lower montane coniferous forest is dominated by Coulter pine (*Pinus coulteri*), manzanita (*Artostaphylos* sp.), coast live oak, and occasional stands of scrub oak. Understory in unburned stands of this plant community is relatively non-existent, consisting mostly of grasses (*Bromus* ssp.). This community is confined to the upper reaches of West Twin Creek/Waterman Canyon, on the western slopes of the canyon.

Disturbed and Ruderal. Plant species within this community consists of weedy grasses such as red brome (*Bromus madritensis*) and Mediterranean grass (*Schismus barbatus*), and weedy forbs such as short-podded mustard (*Hirschfeldia incana*), Russian thistle (*Salsola tragus*) and tocalote (*Centaurea melitensis*). Native species include doveweed (*Eremocarpus setigerus*), telegraph weed (*Heterotheca grandiflora*), and twiggy wreath plant (*Stephanomeria virgata*). Disturbed, ruderal and landscaped plant communities occupy most of the grounds of the Arrowhead Springs Hotel and Spa. Native plant cover in these areas is very sparse.

Landscape/Non-native Landscape

Non-native landscaping includes five species of palm (species unknown), eucalyptus species (*Eucalyptus globulus*), Peruvian pepper tree (*Schinus molle*), fruits trees (apricot, apple, peach) non-native oaks (*Quercus* ssp.), pines (*Pinus* ssp.), citrus trees (lemon, orange, grapefruit), olive and other landscape trees and shrubs. Most of the individual plants found on site are either remnant plantings from the former Arrowhead Springs Spa. Some species have invaded the native habitats around the grounds.

On the grounds of the former Arrowhead Springs Spa and Hotel, there are at least two artificial ponds that were filled with water at the time of the survey. One pond is located in the southernmost portion of the property, just north of existing spreading/percolation basins. No native vegetation exists within the pond. The pond is within an area that appears to have been previously graded and contoured for a development that did not materialize (shown as VRD on figure 5.3-3). The pond is near mixed annual grassland and scrub to the east and north and a strip of southern willow riparian habitat to the northwest. To the south, between the pond and the percolation basins are several groves of large, mature trees and disturbed areas associated with the abandoned development. The second pond is Lake Vonette along the main access road into the spa and hotel facilities, which is actually a dam formed by construction of the roadway. This water body is surrounded by plantings of [non-native] Scotch broom (*Spartium junceum*), pampas grass (*Cortaderia selloana*) and a ring of palm trees. Downstream of Lake Vonette is a low area that supports a dense stand of cattail (*Typha latifolia*) and weedy grasses. This area appears to receive sufficient water to maintain this (apparently) artificial herbaceous wetland.

Hot Springs

Within the project site, natural hot springs, such as the steam cave area occur. Natural hot springs provide specialized environments for wildlife and plant species, however, the springs on the property have been modified from their native state as part of the spa facilities. As a result, the only drainage containing a semi-

natural habitat is the Steam Caves drainage. This drainage is known to support thread-leaved brodieae (*Brodiaea filifolia*), and may support other sensitive plant species.

Plants Species

A total of ninety-six (96) native and non-native plant species representing 39 families were observed on the site. Of these species, 68 are native and 28 are non-native. A list of plant species observed on the site is included in Appendix A of the Biological Resources Assessment report (Volume III, Appendix B of this DEIR).

Wildlife Species

Wildlife species observed during the field surveys are also listed in Appendix A of the *Biological Resources Assessment* report (Volume III, Appendix B of this DEIR). A total of 37 species of wildlife (insects, reptiles, birds, and mammals) were noted. The site has limited potential to support amphibian species along the drainages and in moister areas. Amphibian species expected to occur include California tree frog (*Hyla regilla*) and western toad (*Bufo boreas*).

Sensitive Resources

Four sensitive plant communities were reported in the CNDDB for the San Bernardino North and Harrison Mountain 7.5-minute topographic quadrangles including 1) Riversidean alluvial fan sage scrub (RAFSS); 2) Southern [mixed] riparian forest; 3) Southern cottonwood willow riparian forest; and 4) Southern sycamore alder riparian woodland. Within the project site, RAFSS was determined to be marginally present in the lower reaches of West Twin Creek/Waterman Canyon and East Twin Creek; and southern sycamore alder riparian woodland was present in East Twin Creek and Strawberry Creek.

The CNDDB also lists recorded occurrences of sensitive plant and wildlife species within the area of the Arrowhead Springs project site. Based on the assessment of the habitats present, the CNDDB search, and results of the field surveys, a total of 22 sensitive plant species and 42 sensitive wildlife species were identified as having high, moderate, or low potential to occur on the project site (shown in Table 5.3-4). One fish species, speckled dace (*Rhinichthys osculus ssp. 3*) was identified as present. The potential for one species, the Santa Ana sucker (*Catostomus santaanae*), to occur is unknown. Five sensitive plant species and five (5) sensitive wildlife species have no potential to occur on the site due to lack of suitable habitat to support the species. Sensitive species that were not observed during the surveys and have a low potential to occur are not likely to be present within the project area.

Table 5.3-4
Sensitive Biological Resources – Arrowhead Springs Specific Plan

Resource (Common/Scientific Name)	Status Designation	Occurrence/Probability
VEGETATION COMMUNITIES		
Riversidian alluvial fan sage scrub	Declining plant community	Marginally present in the lower reaches of West Twin Creek/Waterman Creek and East Twin Creek.
Southern mixed riparian forest	Declining plant community	Not Present.
Southern cottonwood willow riparian forest	Declining plant community	Not Present.
Southern sycamore alder riparian woodland	Declining plant community	Present.
PLANTS		
Marsh sandwort *Arenaria paludicola*	FED: END STATE: END CNPS: 1B	None. Although there may be boggy places in and around the Arrowhead Springs Hotel, the area is probably too high in elevation and too steep to provide suitable habitat.
Nevin's barberry *Berberis nevinii*	FED: END STATE: END CNPS: 1B	Low. This species seems to prefer drier slopes; however, it could potentially occur on the hillsides along the upper drainages.
Thread-leaved brodiaea *Brodiaea filifolia*	FED: THR STATE: END CNPS: 1B	High. Species has been found in the vicinity of the Arrowhead Springs Hotel on clay soils probably inundated by warm water.
Orcutt's brodiaea *Brodiaea orcutti*	FED: C2* STATE: None CNPS: 1B	Low. This species is not known from San Bernardino County; however, suitable habitat exists on the hills within the project area around the Arrowhead Springs Hotel.
Palmer's mariposa lily *Calochortus palmeri* var. *palmeri*	FED: C2* STATE: None CNPS: List 1B	Low. The project area does not support true meadows or moist places, however there may be moist places in and around the Arrowhead Springs Hotel.
Plummer's mariposa lily *Calochortus plummerae*	FED: C2* STATE: None CNPS: 1B	Moderate. Site supports suitable habitat in the hillside areas.
Intermediate mariposa lily *Calochortus weedii* var. *intermedius*	FED: C2* STATE: None CNPS: 1B	Low. Species is not known from San Bernardino County, but the site supports suitable habitat in the hillside areas of the property.
Bristly sedge *Carex comosa*	FED: None STATE: None CNPS: 2	Low. There may be habitat in and around the Arrowhead Springs Hotel.
San Bernardino Mountains owl's clover *Castilleja lasiorhyncha*	FED: C2* STATE: None CNPS: 1B	None. No meadows exist within the project areas; the development portions of the site are too low and lacks pine forest meadow habitat.
Smooth tarplant *Centromadia pungens* ssp. *laevis*	FED: C2* STATE: None CNPS: 1B	Moderate. Site contains suitable alkaline soils around the Arrowhead Springs Hotel. There are riparian areas for this species within drainages.
Parry's spineflower *Chorizanthe parryi* var. *parryi*	FED: C2* STATE: None CNPS: 3	Moderate. Suitable habitat exists for this species.
Long-spined spineflower *Chorizanthe polygonoides* var. *longispina*	FED: None STATE: None CNPS: 1B	Low. Suitable habitat exists on site however this species is not recorded from San Bernardino County.
Summer holly *Comarostaphylis diversifolia* ssp. *diversifolia*	FED: None STATE: None CNPS: 1B	High. Chaparral and chamise chaparral is extensive in the hills around the development.

Table 5.3-4
Sensitive Biological Resources – Arrowhead Springs Specific Plan

Resource (Common/Scientific Name)	Status Designation	Occurrence/Probability
Salt marsh bird's beak *Cordylanthus maritimus* ssp. *maritimus*	FED: END STATE: END CNPS: 1B	None. No suitable habitat exists on site. Although historical records exist for this site, the records are questionable since this area is atypical for this species and the only locality description provided is "San Bernardino Valley."
Slender-horned spineflower *Dodecahema leptoceras*	FED: END STATE: END CNPS: 1B	Low. Suitable sandy and gravelly soils have been significantly impacted by flood control measures; however, it may be present in the lower reaches of West Twin Creek/Waterman and East Twin Creeks.
Many-stemmed dudleya *Dudleya multicaulis*	FED: C2* STATE: None CNPS: 1B	Moderate. This species may be present on the hillsides within the project area.
Santa Ana River woolly star *Eriastrum densifolium* var. *sanctorum*	FED: END STATE: END CNPS: 1B	Low. There is no alluvial fan scrub on site; however, the lower reaches of West Twin Creek/Waterman and East Twin Creeks may provide sufficient alluvial soils for this species.
Hot springs fimbristylis *Fimbristylis thermalis*	FED: None STATE: None CNPS: 1B	None. Only known locality within the project area is at the Arrowhead Hot Springs. This area was checked in 1993 and the population apparently had been extirpated.
Robinson's pepper-grass *Lepidium vriginicum* ssp. *Robinsonii*	FED: None STATE: None CNPS: 1B	Moderate. Suitable habitat on site.
Parish's desert-thorn *Lycium parishii*	FED: None STATE: None CNPS: 2	Low. Recent data suggest that known populations from the lower slopes of the San Bernardino Mountains are probably extirpated.
San Bernardino Mountains monkeyflower *Mimulus exiguous*	FED: C2* STATE: None CNPS: 1B	Low. Little is known about this species. It could occur in the moist areas around the Arrowhead Springs Hotel.
Hall's monardella *Monardella macrantha* spp. *hallii*	FED: C2* STATE: None CNPS: 1B	Low. This species is generally found only at higher elevations, and may be present on the higher slopes of the property.
California muhly *Muhlenbergia californica*	FED: None STATE: None CNPS: 1B	Moderate. Suitable habitat exists within the project area along the drainages.
Parish's yampah *Perideridia parishii* ssp. *parishii*	FED: None STATE: None CNPS: 2	None. The project area does not support the damp meadows and is below the known elevation range.
Parish's gooseberry *Ribes divaricatum* var. *parishii*	FED: C2* STATE: None CNPS: 1B	Low. Site does not have true thickets or swamps.
Gambel's water cress *Rorippa gambelii*	FED: None STATE: None CNPS: 2	Moderate. Suitable habitat may be present in the upper reaches of West Twin Creek/Waterman Canyon within the project area.
Sonoran Maiden fern *Thelypteris puberula* var. *sonorensis*	FED: None STATE: CSC CNPS: 2	Moderate. Suitable habitat may be present in the upper reaches of West Twin Creek/Waterman Canyon within the project area.

Table 5.3-4
Sensitive Biological Resources – Arrowhead Springs Specific Plan

Resource (Common/Scientific Name)	Status Designation	Occurrence/Probability
WILDLIFE		
FISH		
Santa Ana sucker *Catostomus santaanae*	FED: THR STATE: CSC	Unknown. Depth may be too shallow to support this species.
Speckled dace *Rhinichthys osculus* ssp. 3	FED: None STATE: CSC FS: Sensitive	Present. This species is know from Strawberry Creek and may be present in East Twin Creek and West Twin Creek/Waterman Canyon.
AMPHIBIANS		
San Gabriel slender salamander *Batrachoseps gabrieli*	FED: None STATE: None	Moderate. Suitable habitat may be present in the upper reaches of West Twin Creek/Waterman Canyon within the project area.
Western spadefoot *Scaphiopus hammondii*	FED: None STATE: CSC	Low. Suitable ponded water habitat may exist along West Twin Creek/Waterman Canyon and East Twin Creek. Suitable habitat also may exist in the isolated pond on the former grounds of the Arrowhead Springs Hotel.
Arroyo toad *Bufo microscaphus*	FED: END STATE: CSC	Low. Suitable water habitat may exist along West Twin Creek/Waterman Canyon and East Twin Creek. Suitable habitat also may exist in the isolated pond on the former grounds of the Arrowhead Springs Hotel.
California red-legged frog *Rana aurora draytonii*	FED: THR STATE: CSC	Moderate. Suitable water habitat may exist along West Twin Creek/Waterman Canyon and East Twin Creek.
Mountain yellow-legged frog *Rana muscosa*	FED: PE STATE: CSC	High. Suitable water habitat may exist along West Twin Creek/Waterman Canyon and East Twin Creek.
REPTILES		
Southwestern pond turtle *Clemmys marmorata pallida*	FED: None STATE: CSC	Low. Basking sites may be absent except in the upper West Twin Creek/Waterman Canyon area.
San Diego horned lizard *Phrynosoma coronatum blainvillei*	FED: None STATE: CSC	High. Suitable habitat exists throughout the project area.
Coronado skink *Eumeces skiltonianus interparietalis*	FED: None STATE: CSC	High. Suitable habitat exists throughout the project area.
Orange-throated whiptail *Cnemidophorus hyperythrus*	FED: None STATE: CSC	High. Suitable habitat exists throughout the project area.
Coastal western whiptail *Cnemidophorus tigris multiscutatus*	FED: None STATE: None	High. Suitable habitat exists throughout the project area.
Silvery legless lizard *Anniella pulchra pulchra*	FED: None STATE: CSC	Low. Although sandy soils occur on site, abundant leaf litter (providing a humid microclimate) does not exist on site.
Southern rubber boa (*Charina bottae umbratica*)	FED: C2* STATE: THR US Forest Service Species of Concern	None. Site does not contain conifer woodland habitat.
Rosy boa *Lichanura trivirgata*	FED: None STATE: None	High. Suitable habitat exists throughout the project area.
Coast patch-nosed snake *Salvadora hexalepis virgultea*	FED: None STATE: CSC	High. Suitable habitat exists throughout the project area.
Two-striped garter snake *Thamnophis hammondii*	FED: None STATE: CSC	Low. Suitable habitat exists north of 40th Street and in the upper reaches of West Twin Creek/Waterman Canyon. Suitable habitat also may exist in the isolated pond on the former grounds of the Arrowhead Springs Hotel.
Northern red-diamond rattlesnake *Crotalus exsul*	FED: C2* STATE: CSC	High. Suitable habitat exists throughout the project area.

Table 5.3-4
Sensitive Biological Resources – Arrowhead Springs Specific Plan

Resource (Common/Scientific Name)	Status Designation	Occurrence/Probability
BIRDS		
White-tailed kite *Elanus leucurus*	FED: None STATE: None (nesting)	Moderate. Property terrain may be too uneven for this species to forage.
Bald eagle *Haliaeetus leucocephalus*	FED: END STATE: END	Low. Species is known to winter at Big Bear Lake; during winter, could fly over site or perch in riparian woodland.
Northern harrier *Circus cyaneus*	FED: None STATE: CSC	Present. Observed during the surveys. Forages over a wide range of open habitat and can be expected to occur throughout most of Southern California. Although no nesting habitat was found, some foraging habitat exists on site.
Sharp-shinned hawk *Accipiter striatus*	FED: None STATE: CSC	Low. Not observed during the surveys, but are expected to forage infrequently over the property during migration and in winter.
Cooper's hawk *Accipiter cooperi*	FED: None STATE: CSC	Moderate. Suitable nesting and foraging habitat exists within the project area.
Golden eagle *Aquila chrysaetos*	FED: None STATE: CSC (nesting and wintering)	Low. Not observed during the surveys. Foraging habitat for this species exists over the entire property. No suitable nesting habitat occurs on site.
Merlin *Falco columbarius*	FED: None STATE: CSC	Low. Not observed during the surveys. Can be expected to forage over the site during migration and in winter. They are expected to use the area very infrequently.
American peregrine falcon *Falco peregrinus anatum*	FED: None STATE: END	Low. Species passes through region during migration and may winter in region; during migration or winter, could fly over site, perch in riparian woodland, and/or forage in surrounding habitats including site.
Prairie falcon *Falco mexicanus*	FED: None STATE: CSC	Low. Not observed during the surveys. Foraging habitat exists for this species over the property, but there is no suitable nesting habitat.
Burrowing owl *Athene cunicularia hypugea*	FED: None STATE: CSC	None. No suitable burrowing habitat exists within the project area. This species may forage on site and in adjacent areas.
Long-eared owl *Asio otus*	FED: None STATE: CSC	Low. Foraging habitat exists on the property, but no nesting habitat.
Black swift *Cypseloides niger*	FED: None STATE: CSC	Moderate. This species may be in the upper reaches of West Twin Creek/Waterman and East Twin Creek.
California gnatcatcher *Polioptila californica*	FED: THR STATE: None	None. No suitable habitat occurs on site.
Loggerhead shrike *Lanius ludovicianus*	FED: None STATE: CSC	Moderate. This species may nest within the and may forage in this area in winter.
Southern California rufous-crowned sparrow *Aimophila ruficeps canescens*	FED: None STATE: CSC	Moderate. Suitable grassland/scrub habitat mix exists in limited areas within the project area.
MAMMALS		
Western yellow bat *Lasiurus xanthinus*	FED: None State: None	Low. This is a low elevation species that may occasionally use the palm trees on site.
Townsend's western big-eared bat *Plecotus townsendii*, two ssp.	FED: None STATE: CSC	Moderate. Because there are a few suitable roost sites in the project area, this species may roost on the property. It may also forage over the property if there are roosting sites such as caves in the nearby mountains.
Pallid bat *Antrozous pallidus*	FED: None STATE: CSC	Moderate. Because there are a few suitable roost sites in the project area, this species may roost on the property. It may also forage over the property if there are roosting sites such as caves in the nearby mountains.

Table 5.3-4
Sensitive Biological Resources – Arrowhead Springs Specific Plan

Resource (Common/Scientific Name)	Status Designation	Occurrence/Probability
Spotted bat *Euderma maculatum*	FED: None STATE: CSC	Moderate. Because there are a few suitable roost sites in the project area, this species may roost on the property. It may also forage over the property if there are roosting sites such as caves in the nearby mountains.
California mastiff bat *Eumops perotis californicus*	FED: None STATE: CSC	Moderate. Because there are a few suitable roost sites in the project area, this species may roost on the property. It may also forage over the property if there are roosting sites such as caves in the nearby mountains.
Big free-tailed bat *Nyctinomops macrotis*	FED: None STATE: CSC	Moderate. Because there are a few suitable roost sites in the project area, this species may roost on the property. It may also forage over the property if there are roosting sites such as caves in the nearby mountains.
San Diego black-tailed jackrabbit *Lepus californicus bennettii*	FED: None STATE: CSC	Low. Scrub cover on this site may be too dense in normal years for this species to persist.
Los Angeles pocket mouse *Perognathus longimembris brevinasus*	FED: None STATE: CSC	Moderate. Suitable habitat exists throughout the project area along the drainages and in the flood control basins.
San Bernardino flying squirrel *Glaucomy sabrinus californicus*	FED: None STATE: CSC U.S. Forest Service Sensitive Species	None. Canopy cover not suitable for this species. Species is known to occur nearby at higher elevations.
White-eared pocket mouse *Perognathus alticola alticola*	FED: None STATE: CSC	None. Site does not contain pine forest habitat.
Northwestern San Diego pocket mouse *Chaetodipus fallax fallax*	FED: None STATE: CSC	High. Suitable habitat exists throughout the project area in the grassland and scrub habitats.
San Bernardino kangaroo rat *Dipodomys merriami parvus*	FED: END STATE: None	Low. Suitable alluvial scrub habitat exists throughout the project area along the lower sections of the drainages.
San Diego desert woodrat *Neotoma lepida intermedia*	FED: None STATE: CSC	High. Suitable habitat exists throughout the scrub habitats of the project area.
Grasshopper mouse *Onychomys torridus ramona*	FED: None STATE: CSC	Low. Suitable habitat exists, but based on the preferred habitat, this species may be further east.
Nelson's bighorn sheep *Ovis canadensis nelsoni*	FED: END, DPS* STATE: THR	Low. Sheep probably are present in the vicinity of the property, but it is unlikely they would be present or use the developed areas of the site. They may occur in the upper reaches of Strawberry and East Twin Creek.
American badger *Taxidea taxus*	FED: NONE STATE: CSC	Low. May be present in higher reaches of Strawberry and East Twin Creek. Sighting from Running Springs.

FED: Federal Classifications
- END Taxa listed as endangered
- THR Taxa listed as threatened
- PE Taxa proposed to be listed as endangered
- PT Taxa proposed to be listed as threatened
- C2* USFWS may, in the future, designate such taxa as Candidates. (*) indicates those C2 candidates that were removed from the list.
- C Candidate for listing.
- None Not designated as a sensitive species
- DPS Distinct Population Segment.

STATE: State Classifications
- END Taxa listed as endangered
- THR Taxa listed as threatened
- CE Candidate for endangered listing
- CT Candidate for threatened listing
- CFP California Fully Protected. Fully
- CSC California Species of Special Concern.
- SA Special Animal. Taxa of concern to the California Natural Diversity Data Base regardless of their current legal or protected status.
- None Not designated as a sensitive species

Table 5.3-4
Sensitive Biological Resources – Arrowhead Springs Specific Plan

Resource (Common/Scientific Name)	Status Designation	Occurrence/Probability

CNPS: California Native Plant Society Classifications

1A Plants presumed by CNPS to be extinct in California
1B Plants considered by CNPS to be rare or endangered in California and elsewhere
2 Plants considered by CNPS to be rare, threatened or endangered in California, but which are more common elsewhere
3 Review list of plants suggested by CNPS for consideration as endangered but about which more information is needed.
4 Watch list of plants of limited distribution whose status should be monitored.

Occurrence Probabilities

Occurs: Observed on the site during this study or recorded on site by other qualified biologists.
Expected: Not observed or recorded on site, but likely to be present at least during a portion of the year.
High: Known to occur in the vicinity of the project site. Suitable habitat exists on site.
Moderate: Known to occur in the vicinity of the project site. Small areas of or marginally suitable habitat exists on site.
Low: No reported sightings within the vicinity of the project. Available habitat limited and rarely used.
None: Focused surveys did not locate the species, or suitable habitat does not exist on site.
Unknown: No data is available on whether species is on or in the vicinity of the site, and information about the species is insufficient to make an accurate assessment of probability/occurrence. Distribution whose status should be monitored.
NA – Not Applicable

Wildlife Corridors

Wildlife movement (more properly recognized as species movement) is the temporal movement of species along various types of corridors. Wildlife corridors are especially important for connecting wildlife habitat areas that have become fragmented; i.e., larger habitat areas broken up into smaller areas that may or may not be capable of independently sustaining wildlife and plant populations.

Major wildlife corridors on the property probably existed along West Twin Creek/Waterman Canyon and East Twin Creek, prior to the residential development of northern San Bernardino and the construction of flood control basins downstream from the confluence of West Twin Creek/Waterman Canyon and East Twin Creek. Although wildlife movement very likely still occurs up and down the main stems of West Twin Creek/Waterman Canyon and East Twin Creek, the abrupt termination of these drainages in the flood control basins, and the presence of the Arrowhead Springs Hotel and Spa has somewhat constrained north-south wildlife movement along drainages and mountain slopes down to the valley bottom. North-south movement probably still occurs north up into the San Bernardino Mountains by way of the drainages and mountain slopes. Water is a limited resource in southern California, and the presence of pools and drainages attracts numerous wildlife species for foraging and nesting. Any movement along east-west corridors is probably still occurring up the northeastern-most portions of East Twin Creek and Strawberry Creek although it may be somewhat affected by the Arrowhead Springs Hotel and Spa to the east and State Route 18 to the west.

Habitat loss has already occurred in the main portion of the property. The open space area around the existing hotel grounds is a large, contiguous, somewhat natural habitat that ultimately connects with the chaparral and conifer habitats of the San Bernardino Mountains.

Jurisdictional Waters and Wetlands

East Twin Creek, Strawberry Creek, West Twin Creek, their tributaries and additional unnamed drainages occur on the property (Figure 5.3-4, *Potential Jurisdictional Waters, Arrowhead Springs Specific Plan*). Based on the assessment of jurisdictional areas for the site, it was estimated that approximately 128 acres of potential jurisdictional drainages occur within the project site along approximately 85,936 linear feet of stream/drainages. The various riparian habitats along some of these drainages may also be wetlands, depending upon the type of soils, hydrology, and plant species present. East Twin Creek, Strawberry Creek, West Twin Creek and their tributaries meet the USACE definition of jurisdictional waters because of the

presence of water flow and the continuous connection to the Santa Ana River through the East Twin Creek flood control channel. The riparian woodlands within these drainages would likely fall under the jurisdiction of the USACE as wetland habitat. The unnamed drainage along State Route 18 probably does not come under the jurisdiction of the USACE because it lacks a connection to a jurisdictional drainage. Flow from the drainage apparently terminates in a spreading basin area just south of State Route 18, although this could not be verified during the field surveys.

East Twin Creek, Strawberry Creek, West Twin Creek, and their tributaries would also fall under the CDFG jurisdiction due to the definable presence of bed and banks and the presence of riparian vegetation. The riparian woodlands would also come under the jurisdiction of the CDFG because of their value to wildlife and connection to a jurisdictional drainage. Additional drainages, such as the unnamed drainage along State Route 18, may also come under the jurisdiction of the CDFG. The artificial ponds, including Lake Vonette, may come under CDFG jurisdiction because of their potential value to wildlife.

5.3.2 Thresholds of Significance

According to Appendix G of the CEQA Guidelines, a project would normally have a significant effect on the environment if the project would:

B-1 Have a substantial effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.

B-2 Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.

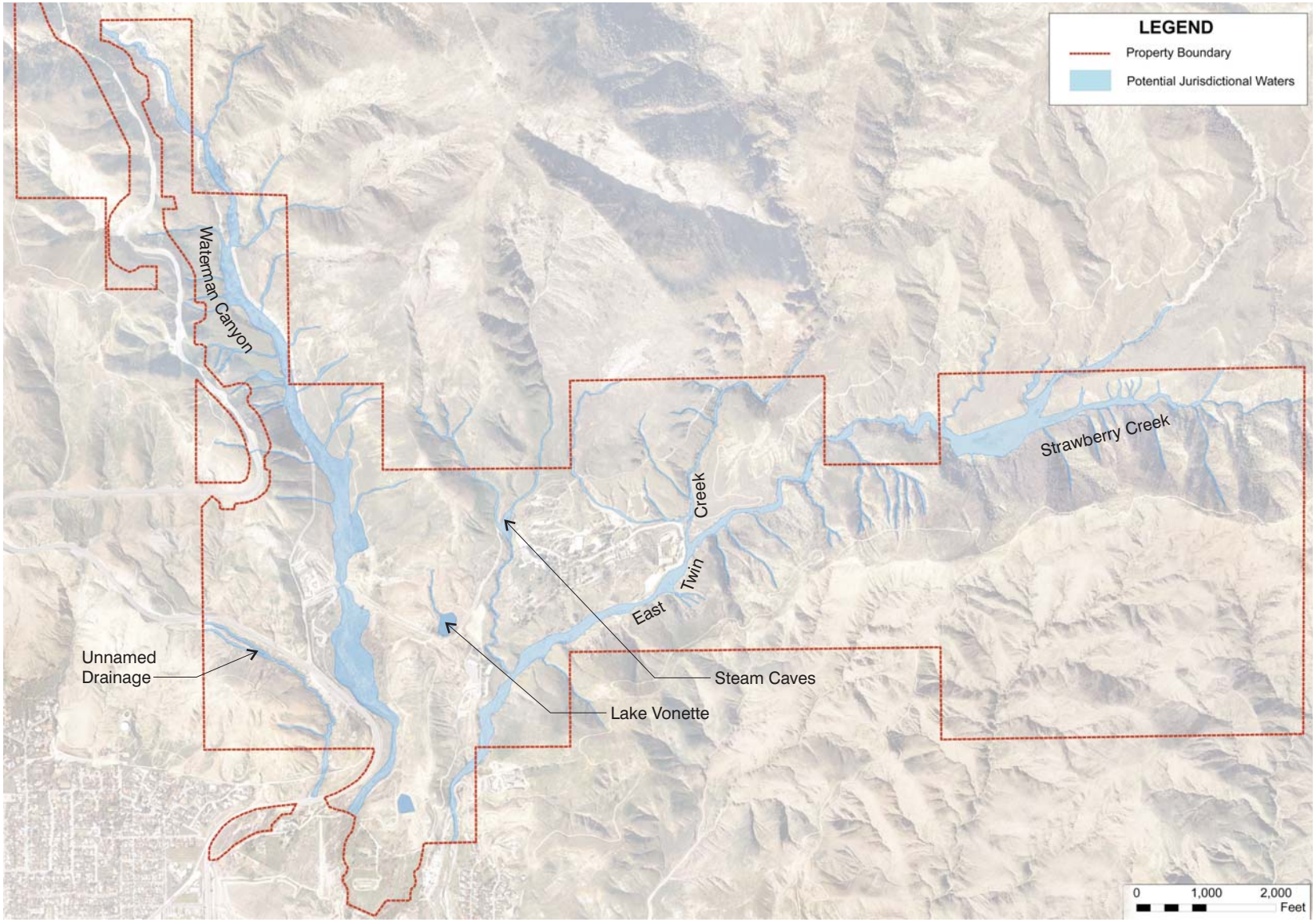
B-3 Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.

B-4 Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors or impede the use of native wildlife nursery sites.

B-5 Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.

B-6 Conflict with the provisions of an adopted habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

Potential Jurisdictional Waters - Arrowhead Springs



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5.3.3 Environmental Impacts

5.3.3.1 San Bernardino General Plan Update

The following impact analysis addresses thresholds of significance for which the Initial Study disclosed potentially significant impacts. The applicable thresholds are identified in parentheses after the impact statement.

GP IMPACT 5.3-1: DEVELOPMENT IN ACCORDANCE WITH THE PROPOSED GENERAL PLAN UPDATE LAND USE DESIGNATIONS WOULD POTENTIALLY RESULT IN THE LOSS OF SENSITIVE VEGETATION COMMUNITIES AND SENSITIVE SPECIES IN UNDEVELOPED PORTIONS OF THE CITY AND SOI. [THRESHOLD B-1]

Impact Analysis: Sensitive vegetation communities in the City and its SOI include coastal sage scrub, Riversidean alluvial fan sage scrub, riparian areas, riparian woodlands and forests, and wetlands. In addition, a number of sensitive plant and animal species are known to occur or have the potential to occur within the City and SOI, particularly in the undeveloped portions to the north. Land within this area, including the foothills and drainages of the San Bernardino Mountains, provides important foraging, dispersal, migratory, and wildlife corridors for many sensitive species. Implementation of the General Plan Update would not result in the direct removal of these sensitive vegetation communities because the General Plan does not infer direct development rights.

However, development in accordance with the General Plan Update could allow for the introduction of primarily residential and commercial land uses into largely undisturbed areas. Such construction has the potential to have direct and indirect impacts on sensitive vegetation communities and individual plant species. The major impact would be the removal of vegetation for building pad development and building and roadway construction. Direct and indirect impacts to sensitive species would result from the elimination of habitat and food resources through vegetation removal. Other potential impacts could increase incidence of fire due to human activities and increased erosion from roadways; the introduction of non-native weedy and insect species, and domestic animal species; increased competition from non-native species that could affect other species ability to forage or establish territories; and increased levels of predation resulting from modifications to on-site topography.

There are limited native biological resources present within the developed portions of the City. Therefore development and redevelopment in accordance with the preferred land use plan would not result in substantial removal or loss of sensitive habitats or species in the urbanized areas of the City.

Per the General Plan update, industrial uses, notably aggregate extraction, would be allowed in the north-western portion of the City including Lytle Creek/Cajon Creek. While parts of this broad, flat wash have been modified by mining activities and is traversed by several rail lines, expansion of existing aggregate mining activities within Lytle Creek/Cajon Creek could potentially impact sensitive alluvial fan scrub habitat and species including the federally-listed slender-horned spineflower.

The land use designations for the undeveloped hillside and mountain areas to the north would remain as Residential Estate, Residential Low, Public Flood Control, and Open Space, per the proposed General Plan update. Hillside Management and Foothill Fire Zone Overlays would also be applied. Vegetation communities and sensitive species within the designated Open Space areas associated with Borea Canyon and Cook Canyon would not be impacted. Any additional construction of public flood control facilities within the area traversed by Devil Canyon could potentially remove native habitat and sensitive species upon implementation per the General Plan land use designations. Within the residential designations, approximately 95,664 total residential units could be developed within the City and SOI on approximately 18,856 acres. The Hillside Overlay would protect biological resources by excluding development in parcels exceeding 15 percent natural slope, protecting natural drainage courses, and requiring preservation,

wherever possible, of natural vegetation and mature trees identified in subsequent environmental review. However, low density development would still occur with implementation in accordance with the General Plan update, ultimately resulting in the removal of sensitive habitat and species.

Designated critical habitat for San Bernardino kangaroo rat and California gnatcatcher overlay portions of the City. The City overlays the westernmost extent of Critical Habitat Unit 1 (Santa Ana River and San Timoteo Canyon) which roughly covers the areas encompassing City Creek, Plunge Creek, and the Santa Ana River wash. It contains tributaries, flood plain terraces and active hydrological channels. Unit 2 (Lytle and Cajon Creeks) roughly covers habitat along and between Lytle and Cajon Creeks from the point that the creeks emanate from canyons within San Bernardino National Forest to flood control channels downstream. The northwesternmost portins of the City are located within Unit 2.

Portions of the City are located within Critical Habitat Unit 11 (San Bernardino Valley MSHCP) which roughly covers approximately 58,000 acres along the foothills of the San Gabriel and San Bernardino Mountains and within the Jurupa Hills on the border of San Bernardino and Riverside counties. Undeveloped areas from the northwesternmost portion of the City to the northeasternmost portion are located within California gnatcatcher critical habitat.

Areas that would be retained as Open Space per the proposed General Plan Update land use plan would not conflict with existing critical habitat areas, including portions of the Arrowhead Springs area and a small area in the northeastern most extent of the City north of Cook Canyon and east of SR 330. Areas proposed for development that overlap with designated critical habitat for these two species include portions of the foothills to the north designated as residential; areas adjacent to the Santa Ana River designated for commercial and industrial uses; and portions of Lytle Creek/Cajon Creek to the northwest where industrial (aggregate extraction) uses are designated. The critical habitat designation would not have any impact on private development. Removal of critical habitat through implementation of federal projects within the City would potentially impact listed and sensitive species. Project applicants would be required to consult with the USFWS regarding potential impacts to listed species that the habitats may support, and to comply with regulatory requirements, including permitting, to offset identified impacts.

Impacts resulting from development of the Arrowhead Springs Specific Plan are addressed separately in the following Section 5.3.3.2.

The majority of potential impacts to sensitive vegetation communities and plant and animal species would occur as a result of project-specific activities developed pursuant to the General Plan update. To minimize the impacts to sensitive plant communities and wildlife species, the General Plan Update establishes goals and policies related to the protection of open space and wildlife habitat. In addition, at the time individual development applications are submitted, the City will assess development proposals for potential impacts to significant natural resources pursuant to CEQA and associated State and Federal regulations and City ordinances. Future proposed development throughout the City would need to be reviewed for compliance with resource agency (including USFWS and CDFG) requirements.

GP IMPACT 5.3-2: DEVELOPMENT IN ACCORDANCE WITH THE PROPOSED GENERAL PLAN UPDATE LAND USE DESIGNATIONS WOULD POTENTIALLY RESULT IN THE LOSS OF RIPARIAN HABITAT IN UNDEVELOPED PORTIONS OF THE CITY AND SOI. [THRESHOLD B-2]

Impact Analysis: Riparian habitat within the City and SOI is potentially present along the Santa Ana River, Lytle Creek/Cajon Creek, City Creek, the canyons and drainages in the foothills of the San Bernardino Mountains, and to a lesser extent within open flood control channels that traverse the City. Portions of riparian habitat associated with Badger Canyon, West Twin Creek, East Twin Creek, Strawberry Creek, and Cook Canyon are currently protected as Open Space. The General Plan Update would retain the areas designated

as Open Space. Since no development would be allowed in these designated open space areas, no impacts would occur to riparian habitat and sensitive species that that the habitat supports.

Undeveloped areas associated with Devil Canyon in the northernmost portion of the City would be designated as Public Flood Control. While no private use or development would be allowed within this designation, future construction of flood control facilities could potentially impact riparian habitat. Low density development in the northern undeveloped portions of the City would be allowed in accordance with the General Plan Update residential designations. Low density development could potentially impact riparian corridors and habitat within these areas. The current Hillside Management Overlay would afford some protection for natural drainage courses and riparian habitat in these areas.

All areas designated for development that have riparian habitat present would be subject to current regulations protecting riparian habitat including Section 404 permits from the USACE, USFWS review, and CDFG regulations under Section 1600. In the future, adoption of the San Bernardino Valley wide MSHCP, and participation by the City would provide additional protection for habitat, including riparian habitat, and sensitive species within undeveloped portions of the City and SOI.

GP IMPACT 5.3-3: DEVELOPMENT IN ACCORDANCE WITH THE PROPOSED GENERAL PLAN UPDATE LAND USE DESIGNATIONS COULD IMPACT USACE AND CDFG JURISDICTIONAL WATERS IN UNDEVELOPED PORTIONS OF THE CITY AND SOI. [THRESHOLD B-3]

Impact Analysis: Potential USACE and CDFG jurisdictional waters and wetlands within the City and SOI are also present along the Santa Ana River, Lytle Creek/Cajon Creek, City Creek, the canyons and drainages in the foothills of the San Bernardino Mountains, and the open flood control channels that traverse the City. Drainages associated with Badger Canyon, West Twin Creek, East Twin Creek, Strawberry Creek, and Cook Canyon are currently protected as Open Space and would retain the Open Space designation upon implementation of the General Plan Update.

Future construction of flood control facilities in the undeveloped areas of Devil Canyon to the north could occur with implementation of the General Plan Update in accordance with the Public Flood Facilities land use designation. Expansion of mineral extraction activities in accordance with the Industrial Extraction land use designation would potentially impact USACE and CDFG jurisdictional waters within Lytle Creek/Cajon Creek. Low density development in the northern undeveloped portions of the City would be allowed in accordance with the General Plan Update residential designations. Low density development could potentially impact drainages within these areas. The current Hillside Management Overlay would afford some protection for natural drainage courses and riparian habitat in these areas. Other areas designated for development would be subject to current regulations protecting waters and wetlands, including the requirements of applicable Section 404 permits from the USACE, USFWS review, Section 401 water quality certification, and CDFG 1600 Streambed Alteration Agreements.

GP IMPACT 5.3-4: DEVELOPMENT IN ACCORDANCE WITH THE PROPOSED GENERAL PLAN LAND USE DESIGNATIONS WOULD POTENTIALLY AFFECT WILDLIFE MOVEMENT CORRIDORS IN UNDEVELOPED PORTIONS OF THE CITY AND SOI. [THRESHOLD B-4]

Impact Analysis: Wildlife corridors most likely occur in the northern undeveloped portions of the City, particularly within riparian corridors and along drainages. Wildlife movement may also occur along Lytle Creek/Cajon Creek, City Creek, and the Santa Ana River and wash, although these areas have been previously modified by urban uses. No wildlife corridors are present in the developed areas of the City. In general development can affect wildlife corridors through an increase in vehicular traffic levels and nighttime light levels. These factors have been found to deter the movement of many animals, particularly in areas where urban and wildland areas interface. Development, primarily low density residential and public flood

control uses, in accordance with the General Plan Update could occur in the northernmost, undeveloped portions of the City and potentially impact wildlife movement in these areas. Wildlife corridors within portions of Borea Canyon and Cook Canyon would be protected by the proposed General Plan Update Open Space designation. Natural drainage courses that wildlife could potentially utilize as movement corridors would also be protected by policies of the Hillside Management Overlay.

GP IMPACT 5.3-5: THE PROPOSED PROJECT WOULD REQUIRE COMPLIANCE WITH THE REQUIREMENTS OF THE CITY OF SAN BERNARDINO HILLSIDE MANAGEMENT DISTRICT OVERLAY AND TREE ORDINANCE. [THRESHOLD B-5]

Impact Analysis: Future project development in accordance with the General Plan update preferred land use plan would comply with relevant policies and ordinances relating to the protection and preservation of biological resources within the City. City Ordinance MC-1027, 9-8-98 and MC-682 regulates removal of mature trees; and the City's Development Code, Hillside Management District Overlay provides protection of slope banks, ridgelines, significant rock outcroppings, native plant materials, and natural hydrology.

GP IMPACT 5.3-6: THE PROPOSED PROJECT WOULD NOT CONFLICT WITH EXISTING CONSERVATION AREAS OR ADOPTED CONSERVATION PLANS. [THRESHOLD B-6]

Impact Analysis: Currently, there is not a regional MSHCP in place to provide cities within San Bernardino County a set mitigation program for offsetting potential impacts of development to the above-listed sensitive plant and wildlife species. However, some conservation areas have been established in the last ten years in response to specific projects, including the sand and gravel operations within the Lytle Creek/Cajon Creek washes. The proposed General Plan land use designation for the area between I-215 and Cajon Boulevard in the northwesterly portion of the City would provide for development of industrial light and heavy, and extractive uses. The existing Cajon Creek Conservation Bank provides preservation land and mitigation credits for alluvial fan scrub habitat and 24 sensitive species associated with Lytle Creek/Cajon Creek. No conflict with the existing conservation area would result.

Areas that would be retained as Open Space per the proposed General Plan Update land use plan would not conflict with existing designated critical habitat areas. Under current regulations, for proposed development areas that overlap with designated critical habitat, project applicants would be required to consult with the USFWS regarding potential impacts to the listed species and to comply with conservation measures and requirements to offset identified impacts.

In the future, upon approval and adoption of the San Bernardino Valley wide MSHCP, and participation by the City, future projects would comply with the HCP and MSHCP.

Relevant General Plan Policies and Programs

Land Use Element

Policy 2.6.1: Hillside development and development adjacent to natural areas shall be designed and sited to maintain the character of the City's significant open spaces and historic landmarks to preserve natural features and habitat.

Policy 2.6.2: Balance the preservation of plant and wildlife habitats with the need for new development through site plan review and enforcement of the California Environmental Quality Act (CEQA).

Policy 2.6.3: Capitalize on the recreational and environmental resources offered by the Santa Ana River and Cajon Wash by requiring the dedication and development of pedestrian and greenbelt linkages.

Natural Resources and Conservation Element

Policy 12.1.1: Acquire and maintain current information regarding the status and location of sensitive biological elements (species and natural communities) within the planning area, as shown on Figure NRC-1.

Policy 12.1.2: Site and develop land uses in a manner that is sensitive to the unique characteristics and that minimizes the impacts on sensitive biological resources.

Policy 12.1.3: Require that all proposed land uses in the "Biological Resource Management Areas" (BRM), Figure NRC-2, be subject to review by the Environmental Review Committee (ERC).

Policy 12.1.4: Require that development in the BRM:

a. Submit a report prepared by a qualified professional(s) that addresses the proposed project's impact on sensitive species and habitat, especially those that are identified in State and Federal conservation programs;

b. Identify mitigation measures necessary to eliminate significant adverse impacts to sensitive biological resources;

c. Define a program for monitoring, evaluating the effectiveness of, and ensuring the adequacy of the specified mitigation measures; and

d. Discuss restoration of significant habitats.

Policy 12.2.1: Prohibit development and grading within fifty (50) feet of riparian corridors, as identified by a qualified biologist, unless no feasible alternative exists.

Policy 12.2.2: Generally permit the following uses within riparian corridors:

a. Education and research, excluding buildings and other structures;

b. Passive (non mechanized) recreation;

c. Trails and scenic overlooks on public land(s);

d. Fish and wildlife management activities;

e. Necessary water supply projects;

f. Resource consumptive uses as provided for in the Fish and Game Code and Title 14 of the California Administrative Code;

g. Flood control projects where no other methods are available to protect the public safety; and

h. Bridges when supports are not in significant conflict with corridor resources; and pipelines.

Policy 12.2.3: Pursue voluntary open space or conservation easements to protect sensitive species or their habitats.

Policy 12.2.4: Development adjacent to riparian corridors shall:

- Minimize removal of vegetation;
- Minimize erosion, sedimentation, and runoff by appropriate protection or vegetation and landscape;

- Provide for sufficient passage of native and anadromous fish as specified by the California Department of Fish and Game;
- Minimize wastewater discharges and entrapment; and
- Prevent groundwater depletion or substantial interference with surface and subsurface flows; and provide for natural vegetation buffers.

Policy 12.2.5: Permit modification of the boundaries of the designated riparian corridors based on field research and aerial interpretation data as part of biological surveys.

Policy 12.3.1: Identify areas and formulate recommendations for the acquisition of property, including funding, to establish a permanent corridor contiguous to the National Forest via Cable Creek and/or Devil Canyon. The City shall consult with various federal, state and local agencies and City departments prior to the adoption of any open space corridor plan.

Policy 12.3.2: Seek to acquire real property rights of open space corridor parcels identified as being suitable for acquisition.

Policy 12.3.3: Establish the following habitat types as high-priority for acquisition as funds are available:

a. Habitat of endangered species;

b. Alluvial scrub vegetation;

c. Riparian vegetation dominated by willow, alder, sycamore, or native oaks; and

d. Native walnut woodlands.

Policy 12.3.4: Preserve and enhance the natural characteristics of the Santa Ana River, City Creek, and Cajon Creek as habitat areas.

Policy 12.3.5: Delineate the habitats of the Santa Ana River Sucker (*Catastomus santaanae*) and Pacific Speckled Dace (*Rhinichthys osculus spp. 3*); develop recommendations for preservation and enhancement of these habitats; and develop standards for development of adjacent lands.

Policy 12.3.6: Prevent further loss of existing stands of Santa Ana River Woolly-star (*Eriastrum densifolium ssp. sanctorum*) and Slender-horned spineflower (*Dodecahema leptoceras*).

Policy 12.3.7: Require that mineral extraction (sand and gravel) projects submit a survey for rare plants prepared by a qualified botanist which shall be prepared in accordance with the Department of Fish and Game's Guidelines for Assessing the Effects of Proposed Developments on Rare and Endangered Plants and Communities (CDFG, 1984).

Policy 12.3.8: Require that mineral extraction projects mitigate impacts to endangered plants according to the Mitigation Policy and Guidelines Regarding Impacts to Rare, Threatened and Endangered Plants developed by the California Native Plant Society Scientific Advisory Committee (January, 1988).

Policy 12.3.9: Restrict off-road vehicle recreation in sensitive habitat areas of Cajon and Lytle Creeks.

5.3.3.2 Arrowhead Springs

AHS IMPACT 5.3-1: DEVELOPMENT OF THE PROJECT WOULD DISTURB OR REMOVE APPROXIMATELY 420 ACRES OF PLANT COMMUNITIES OF WHICH APPROXIMATELY 124 ACRES CONTAIN SENSITIVE VEGETATION COMMUNITIES, PLANT AND ANIMAL SPECIES. [THRESHOLD B-1]

Impact Analysis: Table 5.3-5 details project-related impacts to vegetation communities within the project boundaries. Based on the proposed grading plan, implementation of the project would result in the direct removal of 420.0 total acres of on-site vegetation communities.

Table 5.3-5
Plant Communities in the Arrowhead Springs Specific Plan Area

Plant Community	Acreage	Acreage of Impacts
Annual Grassland (AG/S)	258.7	109.4
Vacated Residential Development (VRD)	39.2	39.1
Chamise Chaparral (CHA)	263.5	43.2
Chaparral (CHP)	914.3	13.6
Disturbed (DIST)	35.3	34.4
Deerweed Scrub (DS)	82.3	16.4
Landscape (LS)	133.9	108.6
Cattail Marsh (MARSH)	2.3	2.3
Lower Montane Coniferous Forest (MON)	38.8	0
Pond (POND)	2.2	2.2
Sycamore Alder Woodland (SAW)*	40.0	0.2
Southern Willow Riparian (SWR)	20.0	19.3
Sycamore Willow Woodland (SWW)	48.4	31.5
Unclassified Non-Native	21.1	0
TOTAL	**1,900.2**	**420.2**

Source: NRA 2005
*Listed in CNDDB Sensitive vegetation communities

Non-sensitive vegetation communities are in the vacated residential development area and disturbed and landscaped areas. As shown in Table 5.3-4, implementation of the proposed project would impact 39.1 acres of the vacated residential development area, approximately 34.4 acres of the disturbed areas and 108.6 acres of existing landscaped areas mainly in the developed area associated with the existing Arrowhead Springs facilities, roads, and area around Lake Vonette.

The proposed residential, mixed use, and golf course, would remove approximately 16.4 acres of native deerweed scrub and 109.4 acres of mixed [native and non-native] annual grassland/scrub habitats. The golf course would require an area of approximately 199 acres, however a small portion of that total acreage has been previously disturbed by the construction activities associated with the MWD Inland Feeder project. Construction of the golf course and associated residential uses along West Twin Creek/Waterman Canyon, would also result in the removal of 43.2 acres of chamise chaparral and 13.6 acres of chaparral located within the hillsides. Chamise chaparral would also be removed by construction of the new hotel and road segment north of Lake Vonette. These native plant communities are relatively common in the San Bernardino Mountains. Impacts to native and non-native vegetation along the perimeter of proposed development areas would mostly result from the installation of vineyards, intended to function as fuel modification zones.

Vegetation communities associated with riparian habitat include sycamore alder woodland, southern willow riparian, and sycamore willow woodland. Riparian habitat in general can support sensitive plants and wildlife.

Implementation of the project primarily through the construction of the golf course and residential uses would result in the removal of 0.2 acres of sycamore alder woodland associated with East Twin Creek/Strawberry Creek; and 19.3 acres of southern willow woodland; and 31.5 acres of sycamore willow woodland, the majority of which are located in West Twin Creek/Waterman Canyon. Sycamore alder woodland is listed in the CNDDB and is considered a declining plant community.

A total of 124 acres of native vegetation (deerweed scrub, chamise chaparral, chaparral, sycamore alder woodland, southern willow riparian, and sycamore willow woodland) would be directly impacted by construction of the proposed project.

The improvements proposed as part of the Arrowhead Springs Specific Plan would potentially result in impacts to the following sensitive species:

Plants

Project implementation would result in the removal of common and sensitive plant species on the project site. Direct impacts may occur as a result of construction activities.

Populations of thread-leaved brodiaea, a federal endangered, state threatened plant species, have been found in the vicinity of the Arrowhead Springs Hotel on clay soils and the Steam Cave drainage area. This species may also occur along West Twin Creek/Waterman Canyon. Rehabilitation of these steam caves associated with construction of improvements to the resort facilities would potentially result in direct impacts to this listed species.

Though not observed on site, additional sensitive plants with high to moderate potential to occur in the drainages and moist areas (particularly around the Arrowhead Springs Hotel) would likely be impacted by golf course construction in West Twin Creek/Waterman Canyon and new road construction that would traverse the minor drainages. These species include smooth tarplant, a federal candidate species, and Sonoran maidenfern, a State Species of Concern. The grasslands and scrub plant communities also support habitat for three federal candidate species with moderate potential to occur onsite, including Plummer's mariposa lily, Parry's spineflower, and many-stemmed dudleya. Implementation of proposed development in these areas, particularly for construction of the golf course and associated residential uses in the hillsides and construction of residential and mixed-use development in the southern portion of the site would potentially remove these species.

During the operational phases of the project, indirect impacts in the form of storm water discharges could potentially degrade or destroy habitat that would impact sensitive plant species.

Wildlife

The primary impacts of the project on wildlife resources are the removal and disruption of habitat and displacement of wildlife, resulting in a less diverse and abundant local faunal population. Project implementation in the short- and long-term would result in direct removal of existing wildlife habitat and mortality of common and sensitive wildlife species existing on the proposed project site. Short term impacts during construction may lead to temporary changes in foraging and land use patterns by resident and nearby species. Indirect project related impacts would include increased human activity, increased ambient noise, higher unnatural nighttime light levels, and increased mortality through road kill by traffic.

Sensitive species observed during the surveys include speckled dace and northern harrier. No federal or state-listed species were observed on the site.

It is unknown if the Santa Ana River sucker (Federally listed threatened) is present in any of the drainages tributary to the Santa Ana River. The speckled dace (State Species of Concern) is known from Strawberry

Creek and may be present in East Twin Creek and West Twin Creek/Waterman Canyon. If speckled dace and Santa Ana sucker are present in West Twin Creek/Waterman Canyon, then construction would potentially impact these species.

Construction of the golf course would involve alterations to portions of West Twin Creek/Waterman Canyon where there is high and moderate potential for the red-legged frog (Federally-listed threatened, State Species of Concern) and yellow-legged frog (Federally proposed endangered, State Species of Concern) respectively, to occur.

Sensitive reptile species were not observed, but suitable habitat exists on site and there is high potential for one federal candidate reptile species (northern red-diamond rattlesnake) to occur.

The San Bernardino kangaroo rat (federally listed endangered) is not known from the West Twin Creek/Waterman Canyon area. The lower reaches of West Twin Creek/Waterman Canyon and East Twin Creek may provide habitat for this species however there is low potential for this species to occur. Also bighorn sheep (federally listed endangered) may occur in the upper reaches of Strawberry and East Twin Creek watershed. However potential to occur is low and this area is not proposed for development.

Nineteen other sensitive wildlife species (including amphibians, reptiles, birds and mammals) have a high to moderate potential to occur onsite as previously mentioned in Table 5.3-4. These species are mostly State Species of Concern or are not listed and are therefore not protected by federal or state listing as threatened or endangered. Any loss of individuals would not threaten regional populations.

The Arrowhead Springs Specific Plan project site mostly lies within the critical habitat designated by USFWS for the coastal California gnatcatcher. Suitable habitat for the gnatcatcher was not present onsite.

AHS IMPACT 5.3-2: DEVELOPMENT OF THE PROJECT WOULD POTENTIALLY RESULT IN THE LOSS OF APPROXIMATELY 51 ACRES OF RIPARIAN HABITAT [THRESHOLD B-2]

Impact Analysis: The CNDDB tracks the occurrence of natural communities considered rare or depleted by the California Department of Fish and Game (CDFG). Four sensitive communities tracked by CDFG are recorded within the geographical vicinity of the project site. One of the sensitive communities present within the project site, southern sycamore alder riparian woodland, is present onsite and would be minimally impacted (0.2 acres) by construction that may encroach into East Twin Creek/Coldwater Canyon. No other development that would impact southern sycamore alder riparian woodland in East Twin Creek and Strawberry Creek is proposed. Two other types of riparian habitat, southern willow riparian (19.3 acres) and sycamore willow woodland (31.5), are mostly present in West Twin Creek/Waterman Canyon. Construction of the proposed golf course, proposed ponds for recycled water storage, and associated residential uses would potentially remove approximately 50.8 total acres of riparian habitat along this drainage.

Indirect impacts to West Twin Creek/Waterman Canyon could potentially result from fertilizer and pesticide runoff from the golf course which could alter water quality of the creek and downstream waters, and degrade the riparian habitat along this drainage and downstream.

AHS IMPACT 5.3-3: THE PROPOSED PROJECT WOULD IMPACT APPROXIMATELY 58 ACRES OF POTENTIAL JURISDICTIONAL WATERS, INCLUDING WETLANDS. [THRESHOLD B-3]

Impact Analysis: The exact location of the main channel of West Twin Creek where the golf course is planned has not been determined through survey and is likely to have shifted in recent years due to severe flooding events. A formal delineation would determine precise jurisdictional limits and impacts from development of the project. However, for purposes of this assessment, as a worst case scenario, it was

assumed that the entire length of the existing drainage shown in Figure 3.3-6 parallel to the stream course labeled "Proposed Stream Course" would potentially be impacted.

Approximately 58.1 acres of potential jurisdictional (USACE and CDFG) waters, including wetlands, would be impacted by the proposed project. Linear impacts to the various drainages would include 2,783 feet within the potential impact area. Construction of the golf course would comprise a significant portion of the impacts to jurisdictional waters and associated riparian habitat along the creek. Grading the pads for the associated residential uses could also potentially encroach into riparian vegetation considered part of CDFG jurisdiction.

Figure 3.3.-4 shows a proposed commercial area adjacent to the unnamed drainage west of Highway 18. Construction of this commercial area could encroach into the drainage and/or potentially discharge fill into the potential jurisdictional drainage.

In addition, there are three proposed bridges (shown on Figure 3.3-5) that would cross potential jurisdictional drainages. The westernmost bridge along the proposed new access road would cross West Twin Creek. A 90-foot bridge north of Lake Vonette would also cross a potential jurisdictional drainage. The second bridge just below the steam caves would cross a CDFG and Corps jurisdictional drainage. Depending upon the design and construction requirements of these bridges, there may be temporary and permanent impacts to these drainages.

There may also be direct impacts to West Twin Creek/Waterman Creek from the design of a series of storage ponds/reservoirs proposed along the golf course. Depending upon final pond design, the work may require dredging or filling of potential jurisdictional areas.

Three separate regulatory processes are all commonly applicable to planned local projects potentially affecting water functions and values. At the federal level, final determinations on jurisdictional waters and permit requirements are generally made by the USACE under Section 404 of the CWA. The applicable RWQCB (Santa Ana) would review projects for water quality certification or waive under Section 401 of the Clean Water Act. Finally, the CDFG executes with project proponents where a relevant Lake or Streambed Alteration Agreement under Section 1600 of the Fish and Game Code would be required.

AHS IMPACT 5.3-4: THE PROPOSED PROJECT WOULD AFFECT WILDLIFE MOVEMENT IN WEST TWIN CREEK/WATERMAN CANYON. [THRESHOLD B-4]

Impact Analysis: Development of the proposed golf course would remove habitat utilized by various species. Any alteration to West Twin Creek/Waterman Canyon and adjacent areas could substantially affect the use of the drainage by foraging raptors and resident and migratory birds. Downstream near the confluence of East Twin Creek and West Twin Creek, existing open space with grassland habitat would be replaced with residential development, further reducing the available foraging habitat.

Impacts to local north-south wildlife movement would result due to loss of native habitat along West Twin Creek/Waterman Canyon from construction and by increased human presence along the banks of the canyon from residential development. Impacts to wildlife movement east to west could also result in the southern portion of the site due to proposed residential development of mostly open space at the confluence of West and East Twin Creeks. Indirect impacts to wildlife movement through increased levels of light and noise associated with the residential development would also result.

Maintaining East Twin Creek and Strawberry Creek drainages in their current condition (subject to natural events such as wildfires and storms), and preservation of over 70 percent of the study area as dedicated open space would partially offset the impacts to wildlife movement. However, a reduction in the wildlife use of the area would be unavoidable. The proposed development adjacent to West Twin Creek/Waterman Canyon would have a substantial effect on wildlife movement.

Habitat fragmentation would not be substantial for most of the project, since most of the development would take place in areas already in use. The conversion of portions of West Twin Creek/Waterman Canyon to golf course and residential development, however, would substantially divide the habitat and wildlife use of this area, in both north-south and east-west directions. Habitat fragmentation of the area between the proposed development in West Twin Creek/ Waterman Canyon and State Route 18 would result.

Although the proposed development would increase in human activity and presence in the area, most of the impact would be in areas that have been occupied in the past. However, the density of the development would be greater with the proposed project than with past use, in that year round occupancy, rather than occasional use of the site, would increase. This would result in wildlife moving farther from the project area, especially with the introduction of exotic pets and plants that typically come with residential development. This impact would be somewhat partially offset by the preservation of Strawberry and East Twin Creek; however, the increase in human activities would inevitably reduce the available habitat for wildlife sensitive to the presence of humans.

Migratory birds, including raptors, utilize the site for foraging and would potentially use the trees onsite to nest. The project site provides 259 acres of potential foraging habitat for birds (mixed annual grassland). Potential nesting areas include native trees associated with riparian vegetation along the drainages and non-native trees in the landscaped areas. Project construction would potentially result in impacts to migratory birds, including raptors, through removal of 109 acres of mixed annual grassland. The removal of trees through site grubbing and grading would also potentially result in impacts to nesting migratory birds, including raptors. Removal or abandonment of nesting birds (non-raptors) within the project site caused by project development would trigger the Migratory Bird Treaty Act.

AHS IMPACT 5.3-5: THE PROPOSED PROJECT WOULD REQUIRE COMPLIANCE WITH THE DEVELOPMENT REGULATIONS AND STANDARDS FOR ARROWHEAD SPRINGS. [THRESHOLDS B-5 AND B-6]

Arrowhead Springs Specific Plan Development Standards

Upon approval of the Arrowhead Springs Specific Plan, the following Development Standards for Arrowhead Springs (Section V), relative to biological resources, would supersede the relevant provisions of the City's Development Code:

Open Space Designations

Public/Commercial Recreation (PCR)

The PCR designation also allows limited agricultural and open space uses, including vineyards, active and passive recreation, permanent open space, wildlife preserves, multi-purpose trails, and water retention basins. It is also intended to preserve water resources, such as watercourses, natural springs and lakes.

Any proposed development in the PCR Zone shall be evaluated by the City on a case-by-case basis. Projects shall be evaluated for the impacts to the surrounding uses in terms of noise, odors, light penetration, aesthetics, traffic and parking. It is the discretion of the Development Services Director if a Special Conditional Use Permit is required based upon the scale of the project and potential impacts.

Open Space – Watershed (OS/W)

The OS/W is intended to preserve water resources, such as watercourses, natural springs and lakes and provide for recreational uses such as trails and stables. Permitted uses are limited to paseos and parks and the condition uses which are also limited shall be evaluated by the City on a case-by-case basis. Projects shall be evaluated for the impacts to the surrounding uses in terms of noise, odors, light penetration,

aesthetics, traffic and parking. It is the discretion of the Development Services Director if a Special Conditional Use Permit is required based upon the scale of the project and potential impacts.

General Development Standards

Hillside Development – Policies

The purpose of these standards are to ensure that development occurs in a manner that protects the hillside's natural and topographic character and identity, environmental sensitivities, aesthetic qualities, and the public health, safety, and general welfare.

The regulations, development standards, and design guidelines for Hillside Development within the Arrowhead Springs Specific Plan are based on the following policies:

- To minimize the effects of grading and ensure that the natural character of hillside areas is retained;
- To protect and balance the rights of property owners with the desire of neighbors to preserve the most visually significant slope banks and ridgelines in their natural state by providing for developing hillsides at low densities;
- To encourage variety in housing types, padding techniques, grading techniques, lot sizes, site design, density, arrangement, and spacing of homes and developments;
- To encourage innovative architectural, landscaping, circulation, and site design;
- To discourage mass grading of large pads and excessive terracing;
- To provide for safe circulation of vehicular and pedestrian traffic to and within hillside areas, and to provide adequate access for emergency vehicles necessary to serve hillside areas;
- To take into account unstable slopes, or slopes subject to erosion and deterioration, in order to protect human lives and property;
- To encourage design and building practices to assure maximum safety from wild fire hazard;
- To preserve visually significant rock outcroppings, native plant materials, and natural hydrology;
- To protect and balance the rights of hillside property owners with the public benefits of reducing the visual effects of grading and minimizing the apparent bulk of structures on ridges and hillsides; and
- To balance the desire of neighbors who may object to changes in a hill's natural shape with the rights of property owners desiring to place upscale homes at low densities on slopes and ridges.

Hillside Development – Plant and Animal Life

- Areas of a site that are identified in the environmental study as having biological significance shall be preserved, unless exempted by the Planning Commission through the Conditional Use Permit process.
- Natural vegetation shall be maintained wherever possible. If removal is required, reestablishment of a compatible plant material on-site will be required at a ratio of at least 2:1.
- All exposed slopes and graded areas shall be landscaped with ground cover, shrubs, and trees.
- Existing mature trees shall be incorporated into the project where feasible (see Figure 5.3).

- Water and energy conservation techniques shall be utilized, such as special irrigation techniques (e.g., drip irrigation), drought tolerant plant species, alluvial rockscape, etc.
- Wherever possible, fire resistant native vegetation shall be preserved and planted.
- Introduction of landscaping within the hillside areas should make maximum use of texture, color, and be capable of blending in with the natural landscape, and help to soften the effects of buildings, walls, pavement, and grading.
- Screening along roadways should make maximum use of berming and landscaping but shall not interfere with sight distance.

5.3.4 Existing Regulations and Standard Conditions

Future projects shall comply with the provisions of the following regulations:

- Federal Endangered Species Act
- California Endangered Species Act
- Clean Water Act, Sections 404, 401, and 402
- Fish and Game Code Section 1600
- Migratory Bird Treaty Act
- City of San Bernardino Municipal Code

Prior to the issuance of permits for any grading activity including but not limited to clearing, grubbing, mowing, discing, trenching, grading, fuel modification, and/or other related construction activity, the City or subsequent project applicant must obtain written authorization from the appropriate Federal, State, and local agencies that have jurisdiction to verify that said activity complies with the regulations enforced by those agencies. Additionally, any mitigation requirements set forth by such agencies will be incorporated into the project's final design plans. Written authorization, along with plans and mitigation measures, will be submitted to the City for review and shall have been approved prior to any grading activity.

5.3.5 Level of Significance before Mitigation

5.3.5.1 San Bernardino General Plan Update

Upon consideration of General Plan policies and implementation of regulatory requirements and standard conditions of approval, the following impacts would be less than significant: GP 5.3-1, GP 5.3-2, GP 5.3-3, GP 5.3-4, GP 5.3-5, and GP 5.3-6.

5.3.5.2 Arrowhead Springs Specific Plan

Upon consideration of development standards and implementation of regulatory requirements and standard conditions of approval, the following impacts would be less than significant:

AHS 5.3-5 The proposed project would comply with the development standards for the Arrowhead Springs Specific Plan development, including Open Space Designations, Hillside Development, Animal and Plant Life policies. There is no existing approved regional HCP or MSHCP applicable to the proposed project. While portions of the project site are within designated coastal California gnatcatcher critical habitat, there is no habitat present. No conflict with existing conservation plans or area plans would occur.

Without mitigation, the following impacts would be **potentially significant**:

AHS Impact 5.3-1 Project implementation, primarily construction in West Twin Creek/Waterman Canyon would result in the direct removal of sensitive vegetation communities. Impacts would be potentially significant.

Direct impacts to one federal and state-listed plant species (thread leaved brodiaea) known to occur on the site; and four federal candidate plant species (smooth tarplant, Plummer's mariposa lily, Parry's spineflower, and many-stemmed dudleya) that were not observed but with a moderate likelihood to occur would result in a potentially significant impact.

Direct impacts to one federal threatened and one federal proposed endangered amphibian species, and one federal candidate wildlife species

AHS Impact 5.3-2 Approximately 51 acres of riparian habitat would be impacted by construction of the proposed project.

AHS Impact 5.3-3 Approximately 58 acres of potential jurisdictional (USACE and CDFG) waters, including wetlands, would be impacted by the proposed project.

AHS Impact 5.3-4 The proposed project may potentially affect the movement of resident or migratory wildlife species in West Twin Creek/Waterman Canyon.

5.3.6 Mitigation Measures

5.3.6.1 San Bernardino General Plan Update

No significant impacts were identified and no mitigation measures would be required.

5.3.6.2 Arrowhead Springs

AHS 5.3-1 Prior to the issuance of grading permits, a qualified biologist shall conduct detailed surveys for sensitive vegetation communities, plants, and wildlife that occur within the final grading footprint and associated construction staging areas for the proposed development. If listed species are determined to be present, consultation with the USFWS and CDFG shall be initiated. The applicant shall comply with project-specific permit conditions and requirements developed through consultation with USFWS and CDFG. Including:

- Avoidance and minimization of impacts to listed species through revised project design.
- Provision of in-kind native habitat/vegetation through onsite revegetation and restoration at a minimum 2 to 1 ratio or higher ratio as required by USFWS and CDFG.
- Provision of compensation through acquisition of offsite mitigation areas at a minimum 2 to 1 ratio or higher ratio as required by USFWS and CDFG.

AHS 5.3-2A Prior to the issuance of grading permits for any project potentially affecting riparian habitat, jurisdictional waters, and/or wetland habitat, the property owner/developer shall provide evidence to the that all necessary permits have been obtained from the CDFG (pursuant to Section 1600 of the Fish and Game Code) and the USACE

(pursuant to Section 404 of the CWA) or that no such permits are required, in a manner meeting the approval of the Director of Development Services for the City of San Bernardino. Section 404 Permits from the USCOE will also require a Section 401 Water Quality Certification from the California RWQCB Santa Ana. Project applicant shall provide evidence of a Section 401 Water Quality Certification. If federally listed species are present, consultation with USFWS shall also occur in conjunction with the Section 404 permit.

AHS 5.3-2B

Prior to issuance of a grading permit for any area containing resources subject to the jurisdiction of USACE and CDFG, USFWS, and RWQCB, a comprehensive Revegetation and Restoration Plan shall be developed by the applicant in consultation with the applicable agencies. The plan shall incorporate the applicable permit conditions and requirements of these agencies including the Section 404 Permit, 401 Water Quality Certification, and CDFG Section 1600 Streambed Alteration Agreement.

Native vegetation shall be installed at a minimum ratio of 2 to 1 and maintained along the developed/wildland interface of the golf course and associated residential units, including local native plant landscaping.

The plan will address the following items:

- *Responsibilities and qualifications of the personnel to implement and supervise the plan*: The responsibilities of the landowner, specialists and maintenance personnel that will supervise and implement the plan will be specified.

- *Site selection:* The site for mitigation will be determined in coordination with the City, USFWS, CDFG, and USFWS. The site will be located within land to be purchased or preserved off site within the San Gabriel watershed.

- *Restoration and Creation of Habitat:* The plan shall require the creation of riparian habitat in the amount and of the type required by CDFG and USACE, provided, however, that, in order to assure no net loss of jurisdictional resources on an acre-for-acre basis, all impacted USACE and CDFG jurisdictional habitat shall be compensated by restoration, enhancement or creation at a minimum of 3:1 ratio.

- *Site preparation and planting implementation:* The site preparation will include: 1) protection of existing native species, 2) trash and weed removal, 3) native species salvage and reuse (i.e. duff), 4) soil treatments (i.e. imprinting, decompacting), 5) temporary irrigation installation, 6) erosion control measures (i.e. rice or willow wattles), 7) seed mix application, and 8) container species.

- *Schedule:* A schedule will be developed that includes planting to occur during the appropriate season.

- *Maintenance plan/guidelines:* The maintenance plan will include: 1) weed control, 2) herbivory control, 3) trash removal, 4) irrigation system maintenance, 5) maintenance training, and 6) replacement planting.

- *Monitoring plan:* The monitoring plan will include: 1) qualitative monitoring (i.e., photographs and general observation), 2) quantitative monitoring (i.e., randomly placed transects), 3) performance criteria as approved by the resource agencies, 4) monitoring reports for three to five years, 5) site monitoring as required by the resource agencies to ensure successful establishment of riparian habitat within the restored and created area. Successful establishment is defined per the performance criteria agreed to by the USACE, USFWS, CDFG, and the City or subsequent project applicant.

- *Long-term preservation:* Long-term preservation of the site will also be outlined in the conceptual mitigation plan.

AHS 5.3-2C The applicant shall ensure that polluted runoff from the golf course will not enter riparian habitat and jurisdictional waters, including wetland habitat, through implementation of Mitigation Measures 5.7-1B, 5.7-1C, 5.7-1D, and 5.7-1E (Section 5.7, Hydrology).

AHS 5.3-3 Project applicant shall implement mitigation measure 5.3-2 to address impacts to jurisdictional waters and wetlands.

AHS 5.3-4A Prior to issuance of a grading permit for the golf course construction and creek realignment, the applicant shall conduct a wildlife corridor/movement analysis of West Twin Creek/Waterman Canyon to identify and define the limits of the existing wildlife corridor. Based on the results of the analysis, and in consultation with a qualified biologist and a qualified native community restorationist, the landscaping plan for manufactured slopes along the drainage shall include:

- Provision of north-south wildlife movement and linkage opportunities for the affected species along and adjacent to the realigned creek.

- Planting of a minimum 25-foot buffer zone, within a 50-foot setback, of native shrubs and trees that provide maximum screening.

- Exterior lighting shall be prohibited within the 50-foot setback zone. Light sources adjacent to the wildlife corridor shall be directed away from the corridor.

- To allow for the mobility of animals, fencing used in the 50-foot setback zone shall be limited to open fencing, such as split rail fencing, which does not exceed 40 inches in height above the finished grade.

AHS 5.3-4B If construction activities, including removal of riparian vegetation or construction adjacent to riparian habitat, is to occur between March 15 and August 30, the project proponent shall have a biologist conduct a pre-construction, migratory bird and raptor nesting site check. The biologist must be qualified to determine the status and stage of nesting effort by all locally breeding raptor species without causing intrusive disturbance. If an active nesting effort is confirmed very likely by the biologist, no construction activities shall occur within at least 300 feet of the nesting site until measures to address the constraint are agreed to by the project proponent and USFWS personnel. This agreement may be made by conference call, an on-site meeting, or other mutually agreeable means.

Measures available as options to address this constraint are dependent on the species and any other protections afforded it, details of the nest site, the nest stage, types and levels of ongoing disturbances, the relevant project actions, and distances involved. Specific measures would be determined by the regulating agency (USFWS).

5.3.7 Level of Significance After Mitigation

Upon implementation of the above mitigation measures identified above, potential significant impacts associated with biological resources would be reduced to a level that of less than significant and no unavoidable adverse impacts would occur.

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5.4 CULTURAL RESOURCES

Cultural resources include places, object, settlements, which reflect group or individual religious, archaeological, architectural, or paleontological activities. Such resources provide information on scientific progress, environmental adaptations, group ideology or other human advancements. This section of the EIR evaluates the potential for implementation of the General Plan Update to impact cultural resources in the City of San Bernardino and its Sphere of Influence (SOI). The analysis in this section is based, in part, upon the following information:

- Archaeological Survey for the Arrowhead Springs Project, San Bernardino County, California, SWCA Environmental Consultants, January 2005.
- Historic Resources Report Arrowhead Springs Hotel San Bernardino, CA (Administrative Draft), San Buenaventura Research Associates, February 16, 2005.

A complete copy of these studies is included in Volume III, Appendix C, Cultural Resources.

Current website information and pertinent documents from the City of San Bernardino and other appropriate agencies were also used in preparation of this section. These include:

- People of the Pines. January 2005, prepared by the San Manual Band of Mission Indians.

5.4.1 Environmental Setting

Regulatory Background

Federal and State Regulations

National Historic Preservation Act

The National Historic Preservation Act of 1966 authorized the National Register of Historic Places and coordinates public and private efforts to identify, evaluate, and protect the Nation's historic and archeological resources. The National Register includes districts, sites, buildings, structures, and objects that are significant in American history, architecture, archeology, engineering and culture.

Section 106 (Protection of Historic Properties) of the National Historic Preservation Act of 1966 (NHPA) requires Federal agencies to take into account the effects of their undertakings on historic properties. Section 106 Review refers to the Federal review process designed to ensure that historic properties are considered during Federal project planning and implementation. The Advisory Council on Historic Preservation, an independent Federal agency, administers the review process, with assistance from State Historic Preservation Offices.

Archaeological Resources Protection Act

The Archaeological Resources Protection Act of 1979 regulates the protection of archaeological resources and sites which are on public [federal] lands and Indian lands.

Native American Graves Protection and Repatriation Act

The Native American Graves Protection and Repatriation Act (NAGPRA) is a Federal law passed in 1990 that provides a process for museums and Federal agencies to return certain Native American cultural items, such as human remains, funerary objects, sacred objects, or objects of cultural patrimony, to lineal descendants, and culturally affiliated Indian tribes.

Archaeological, paleontological, and historical sites are protected pursuant to a wide variety of state policies and regulations enumerated under the California Public Resources Code. In addition, cultural and paleontological resources are recognized as a non-renewable resource and therefore receive protection pursuant to CEQA.

California Public Resources Code

- California Public Resources Code 5020-5029.5 continued the former Historical Landmarks Advisory Committee as the State Historical Resources Commission. The Commission oversees the administration of the California Register of Historical Resources, and is responsible for the designation of State Historical Landmarks and Historical Points of Interest.

- California Public Resources Code 5079-5079.65 defines the functions and duties of the Office of Historic Preservation (OHP). The OHP is responsible for the administration of federally and state mandated historic preservation programs in California and the California Heritage Fund.

- California Public Resources Code 5097.9.-5097.998 provides protection to Native American historical and cultural resources, and sacred sites and identifies the powers and duties of the Native American Heritage Commission (NAHC). It also requires notification of discoveries of Native American human remains, descendants and provides for treatment and disposition of human remains and associated grave goods.

California Senate Bill 18

Existing law provides limited protection for Native American prehistoric, archeological, cultural, spiritual, and ceremonial places. These places may include sanctified cemeteries, religious, ceremonial sites, shrines, burial grounds, prehistoric ruins, archaeological or historic sites, Native American rock art inscriptions, or features of Native American historic, cultural, and sacred sites.

Senate Bill 18, signed into law in September 2004, requires cities and counties to notify and consult with California Native American Tribe(s) about proposed local land use planning decisions for the purpose of protecting Traditional Tribal Cultural Places ("cultural places"). It requires establishment of a Native American Traditional Tribal Cultural Site (TTCS) Register, which would list all Native American sites deemed by the NAHC to be sacred to local tribes. SB 18 provides a new definition of TTCS requiring a traditional association of the site with Native American traditional beliefs, cultural practices, or ceremonies or the site must be shown to actually have been used for activities related to traditional beliefs, cultural practices, or ceremonies. Previously a site was defined to require only an association with traditional beliefs, practices, lifeways, and ceremonial activities.

SB 18 institutes as new process which would require a city or county to consult with the NAHC and any appropriate Native American tribe for the purpose of preserving relevant TTCSs prior to the adoption, revision, amendment, or update of a city's or county's general plan or specific plan. As of March 1, 2005, cities and counties must send their general plan and specific plan proposals to those California Native American Tribes that are on the NAHC's contact list and have traditional lands located within the city or county's jurisdiction. To help local officials meet these new obligations, SB 18 requires the Governor's Office of Planning and Research (OPR) to amend its General Plan Guidelines to include advice to local government on how to consult with California Native American Tribes.

Developed in cooperation with the NAHC, the OPR guidelines include advice for consulting with California Native American Tribes for:

- The preservation of, or the mitigation of impacts to cultural places;

- Procedures for identifying through the NAHC the appropriate California Native American tribes;

- Procedures for continuing to protect the confidentiality of information concerning the specific identity, location, character, and use of cultural places; and
- Procedures to facilitate voluntary landowner participation to preserve and protect the specific identity, location character, and use of cultural places [GC §65040.2(g)].

Also under SB 18, a new process requires the Lead Agency on a project covered by CEQA to ask the NAHC whether the proposed project is within a 5-mile radius of a TTCS. The NAHC would have 30 days to inform the Lead Agency if the proposed project is within proximity to a TTCS and another 45 days to determine whether the project would have an adverse impact on the TTCS. If the NAHC, the tribe, and interested parties agree upon the mitigation measures necessary for the proposed project, it would be included in the project's EIR. If both the City and the tribe agree that adequate mitigation or preservation measures cannot be take, then neither party is obligated to take action.

5.4.1.1 San Bernardino General Plan

Prehistory

Archaeological data and correlations with ethnographic data have resulted in the determination of the following chronology for Southern California prehistoric times:

- **Early Man Horizon:** This period, pre-dating 6,000 B.C., is characterized by the presence of large projectile points and scrapers, suggesting reliance on hunting rather than gathering.
- **Milling Stone Horizon:** This period, from 6,000 B.C. to 1,000 B.C., is characterized by the presence of hand stones, milling stones, choppers and scraper planes; tools associated with seed gathering and shell fish processing with limited hunting activities; and evidence of a major shift in the exploitation of natural resources.
- **Intermediate Horizon:** This period, from 1,000 B.C. to A.D. 750, reflects the transitional period between the Milling Stone and Late Prehistoric Horizons. Little is known of this time period, but evidence suggests interactions with outside groups and a shift in material culture reflecting this contact.
- **Late Prehistoric Period:** This period, from A.D. 750 to European contact, is characterized by the presence of small projectile points; use of the bow and arrow; steatite containers and trade items; asphaltum; cremations; grave goods; mortars and pestles; and bedrock mortars.

Historic Development of San Bernardino

The first inhabitants of San Bernardino valley were Native Americans who may have settled along the Santa Ana River as early as 8000 BC. Natives living in the valley when the Spanish military and missionary parties arrived were Uto-Aztecan, Takic speakers, possibly including group's known as Serrano, Luiseno and Gabrielino. Later, a Mountain Cahuilla group was brought to the valley by the local Spanish family to work their rancho. The only local Native American community in existence at present is the San Manuel Indian Reservation on the northern city boundary.

The first documented Spanish settlement within San Bernardino valley was established in 1810. The site of this settlement was dedicated as the Rancho de San Bernardino of Mission San Gabriel. In 1819 second Rancho de San Bernardino was established at a site known as the Guachama rancheria, located a few miles east of the possible original settlement in what is now the City of Loma Linda. Two years later, in 1821, a branch of Mission San Gabriel was established within the present boundaries of the City of Redlands. From this branch mission, the development of agriculture within the valley began. Water was transported via a ten-

mile ditch from Mill Creek to irrigate olive trees and vineyards. With the transition of political power from Spanish authority to Mexican control in 1822, attitudes toward land ownership and use underwent a major shift.

From the period of initial settlement in 1810 to 1839, sole control over lands in the valley was in the hands of the church. Around 1840, following the establishment of the Mexican republic, large grants of private land (ranchos) by the acting governor to three brothers of the prominent Lugo and Diego Sepulveda families signaled a change in private control, and the beginnings of large scale ranching and agriculture in the valley. The Lugos sold a large portion of the San Bernardino Rancho to a group of 800 Mormons (Church of the Later Day Saints).

In 1854 San Bernardino became incorporated as a city. This occurred one year after the County of San Bernardino was split from the Counties of San Diego and Los Angeles. Its population consisted of approximately 1,200 inhabitants, 75 percent of whom were Mormon. Over the next few years, the character of the City reflected the values of its chief inhabitants; but in 1857, Mormons from across the country were recalled to Utah. Unsettled and unclaimed property of approximately 8,000 acres was purchased and subdivided.

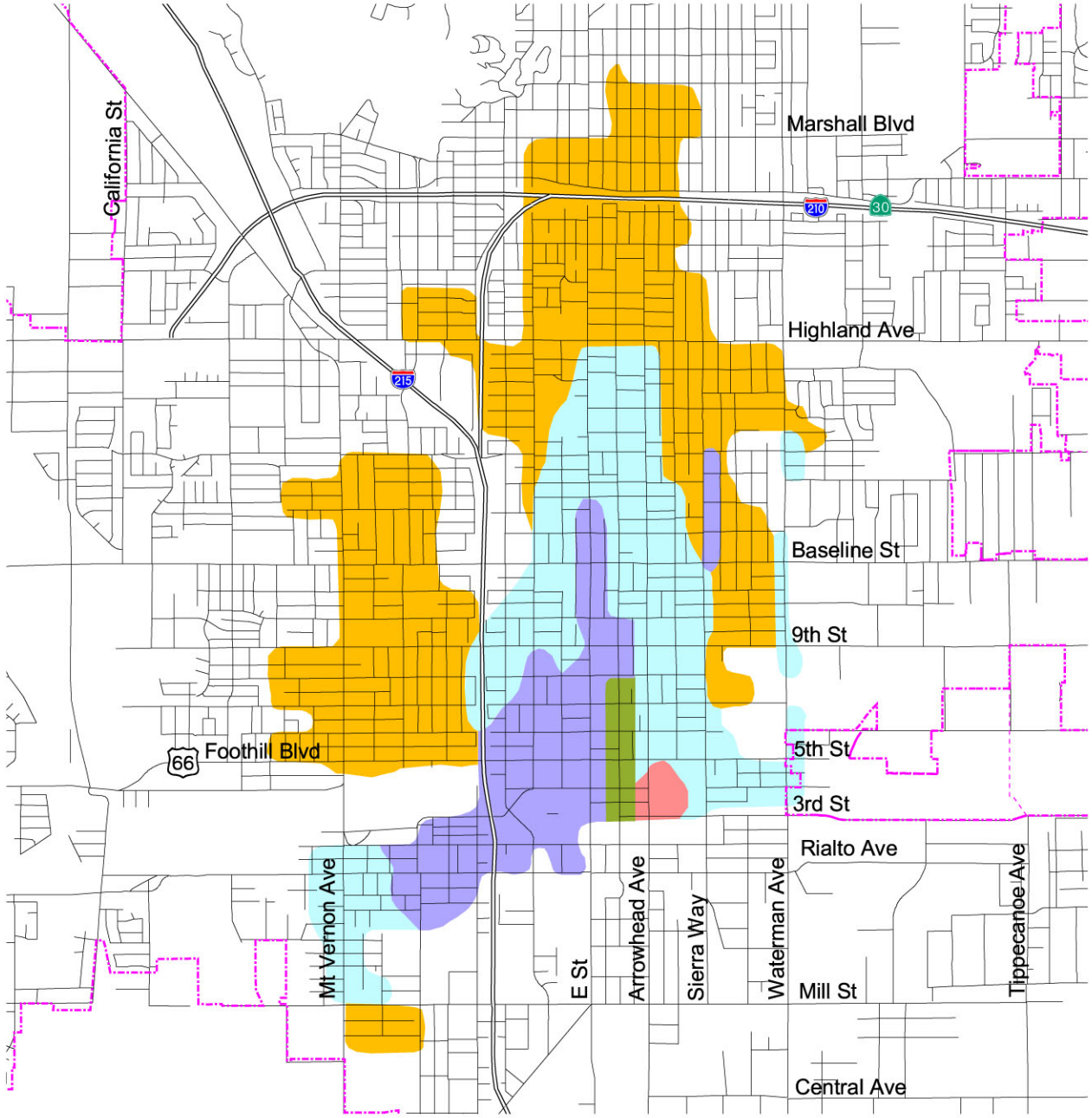
The agricultural character of the valley, established during the Mexican and Mormon periods, continued to dominate the local economy; however, with continued development of the timber and mineral resources of the mountains and desert, the character of the City slowly emerged as a regional commercial center.

With the completion of rail connections between the desert and Los Angeles in 1887 by the Santa Fe Railroad, San Bernardino soon developed into a railhead boomtown. Commercial enterprises dominated the urban landscape, with emphasis upon service and retail establishment, while industrial enterprises supported agricultural development.

The commercial core of the City of San Bernardino grew slowly to the east, west, and north. Downtown businesses included hotels, restaurants, saloons, retail shops, and small service-oriented businesses. Property to the south appears to have remained primarily agricultural. To the west of the core, transportation related industries developed around the Santa Fe rail yard. To the north and east of the core, relatively small agricultural farms and ranches dominated. Service industries slowly intermingled with the eastern farms, while farms to the north developed into the primary residential district of the City. See Figure 5.4-1, *Historical Patterns of Development*.

Urban land use expansion continued outward from the downtown core, reflecting the basic patterns established in the late nineteenth century. Residential growth in the twentieth century continued to expand into the rural agricultural zone, with redevelopment of earlier residential areas also occurring. Commercial establishments continually replaced one another, slowly expanding into residential districts. Service and light manufacturing industries continued an association with the transportation corridors, relying initially upon easy access to rail and wagon roads, and later upon paved highways. With the arrival of air transportation, commercial fields were established in rural agricultural areas, and combined with the industrial pattern for easy access to rail lines, set the stage for the establishment of local military facilities during World War II.

Historical Patterns of Development in San Bernardino 1860 - 1935



1860 - 1870
1870 - 1880
1880 - 1900
1900 - 1920
1920 - 1935

City Boundary
Sphere of Influence

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Historical Resources

Historic resources are defined as buildings, structures, objects, sites and districts of significance in history, archaeology, architecture and culture. These resources include intact structures of any type that are 50 years or more of age. These resources are sometimes called the "built environment" and can include, in addition to houses, other structures such as irrigation works, and engineering features. Historic resources are preserved because they provide a link to a region's past as well as a frame of reference for a community. Often these sites are a source of pride for a City.

The San Bernardino area contains a considerable variety of historic residential architecture, including California and Craftsman Bungalows, Spanish Colonial Revival and Victorian, among others. A *Historic Resources Reconnaissance Survey Report*, completed in 1991 to evaluate residential and commercial districts of potential historic district merit. The *Historic Resources Reconnaissance Survey Report* is contained in five volumes and available at City Hall.

The intent of the historic survey was to identify general concentrations of historic structures, defined as buildings constructed prior to 1941, which have maintained their architectural integrity. Concentrations of pre-1941 homes were found to exist throughout the surveyed area. The overall quality of these historic neighborhoods varied widely. Several of the areas surveyed were of potential historic district merit, containing a cohesive collection of pre-1941 buildings of similar history and architectural identity. Although not adopted, the potential historic districts identified consist of four residential and two commercial districts and range in size from two blocks to over one square mile. In addition to concentrated districts, San Bernardino contains individual structures located throughout the planning area which are historically significant. The 1988 City of San Bernardino General Plan EIR Technical Background Report, available at the City of San Bernardino, provides descriptions of those designated historic landmarks in the City, which include one listing on the National Register of Historic Places (NRHP), eleven California Points of Historical Interest (CPHI) and one State of California Historic Structure (CHS). These landmarks are listed below. In addition, 31 structures are identified therein which have potential for cultural significance.

<u>National Register of Historic Places</u>

- San Bernardino Post Office (NRHP-L-85-136)

<u>California Historical Landmarks and Points of Historical Interest</u>

- Santa Fe Railroad Station Building (CPHI-53)
- Anderson Building (CPHI-90)
- Heritage House (CPHI-102)
- Sturges Auditorium (CPHI-100)
- California Theater (CPHI-103)
- St. Bernardine of Siena Catholic Church (CPHI-106)
- Home of Eternity Cemetery of Congregation Emanuel (CPHI-44)
- Pioneer Cemetery (CPHI-24)
- Rudolf Hack Residence and West Twin Creek Water Company Flume (CPHI-104)
- Home of Neighborly Service (CPHI-88)
- Courthouse Clock

<u>State Historic Structures</u>

- Patton State Hospital Residence (#1 and #2) (CHS-2369-1)

Archaeological Resources

Archaeological resources are the physical remains of past human activities and can be either prehistoric or historic in origin. Archaeological sites are locations that contain significant evidence of human activity. Generally a site is defined by a significant accumulation or presence of one or more of the following: food remains, waste from the manufacturing of tools, tools, concentrations or alignments of stones, modification of rock surfaces, unusual discoloration or accumulation of soil, or human skeletal remains. Archaeological sites are often located along creek areas, ridgelines, and vistas.

Areas of high archaeological sensitivity within San Bernardino are found in Figure 5.4-2 below. The archeological sensitivity figure contains areas of know resources or reasonably could contain resources and which had demonstrable surface integrity as of November 1987. The City's center has been identified as an Urban Archaeological District based on it being the center of the area's history of cultural development.

Paleontological Resources

Paleontological resources are the fossilized remains of organisms from prehistoric environments found in geologic strata. These resources are valued for the information they yield about the history of the earth and its past ecological settings. There are two types of resources; vertebrate and invertebrate paleontological resources. These resources are found in geologic strata conducive to their preservation, typically sedimentary formations. Paleontological sites are those areas that show evidence of pre-human activity. Often they are simply small outcroppings visible on the surface or sites encountered during grading. While the sites are important indications, it is the geologic formations that are the most important since they may contain important fossils. Potentially sensitive areas for the presence of paleontological resources are based on the underlying geologic formation. Fossil remains may occur throughout the City of San Bernardino, although the evenness of their distribution is not known. The potential for fossil occurrence depends on the rock type exposed at the surface in a given area.

Native American History

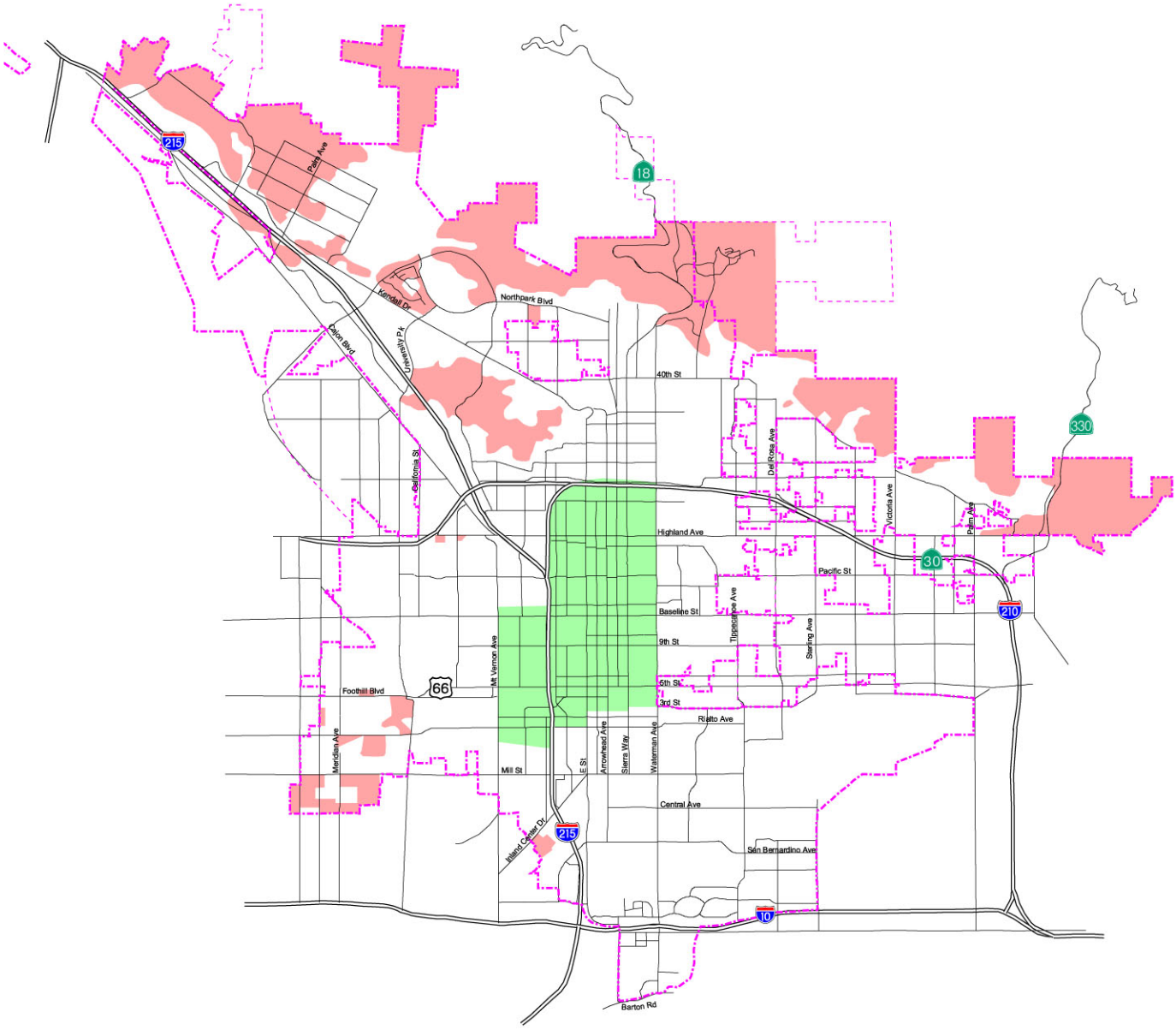
San Manuel Band of Mission Indians

Descendents of the Serrano Indians, the San Manuel Band of Mission Indians roamed a territory that spanned the San Bernardino Mountains and valley and adjoining desert lands. The origin of the name, San Manuel Band of Mission Indians, is the result of Yuhaviatam engagement with colonizing European and American powers. The term Mission Indians originated from the 21 missions established by Spanish settlers along California's coast from 1769 to 1823, from San Diego to San Francisco. In their native language, they call themselves Yuhaviatam, or People of the Pines. After first contact, Spanish soldiers soon invaded the Serrano villages, removing the people from their ancient homelands and placing them into the mission system where many died from new diseases and the changes in their diet.

By the mid-1800s sweeping change was brought to California and the United States with the passage of the Treaty of Guadalupe Hidalgo in 1848 and the California Gold Rush of 1849. New settlers came to California, radically changing the Serrano lands with their ranching, farming, and logging. In 1866, unrest came to the area as militia forces from San Bernardino killed Serrano men, women, and children in a 32-day campaign. Yuhaviatam tribal leader Santos Manuel safely led the remaining Yuhaviatam from their ancient homelands in the mountains to the valley floor.

In 1891 with passage of the Act for Relief for Mission Indians the San Manuel reservation was established and recognized as a sovereign nation with the right of self-government. The San Manuel reservation was

Archaeological Sensitivities



Area of Concern for Archaeological Resources

Urban Archaeological District - Historical Archaeological Resources of 19th Century San Bernardino

City Boundary

Sphere of Influence

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Source: Envicom Corporation

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named for a great tribal leader, Santos Manuel, and henceforth the tribe was recognized as the San Manuel Band of Mission Indians. The reservation originally consisted of 657 acres of steep foothills of the San Bernardino Mountains, to near the top of Mount McKinley. Today it consists of just over 800 acres of mostly mountainous land and is located in the foothills of the San Bernardino Mountain region, just north of the City of Highland. Few people still speak the Serrano language, and few ancestral rituals survive. Some continue to sing traditional Bird Songs on special social occasions. Approximately 85 Serrano people currently live on the San Manuel Reservation. Many of the 1,000 or so residents who live on or near the Morongo Reservation and near the Soboba Reservation are also of Serrano descent.

In the mid-1980s, the San Manuel Band of Mission Indians invested in a high-stakes bingo operation. The San Manuel Indian Bingo gaming facility was expanded in 1994. In December 2000, the San Manuel Bottled Water Group was founded as part of a federal charter granted to the Tribe to allow tribal business diversification. Encompassing gaming and other enterprises, the San Manuel Band of Mission Indians is one of the largest employers in the Inland Empire area and employs over 2,000 people.

Tribal government consists of two governing bodies: a seven-member elected Tribal Council which acts as the Business Committee and a General Council. The Tribal Council is responsible for enforcing by-laws, establishing policies, protecting business interests and preserving the sovereignty of the tribe.

5.4.1.2 Arrowhead Springs

Historic Background

General Historical Context

People traveling between the Colorado River and coastal settlements used the Mojave Trail, located west of the current study area, for hundreds of years. Although the Mojave Trail was one of the first trails used by early explorers, it was all but abandoned when the gentler Cajon Pass area became known.

As previously mentioned a Mormon colony was established in the 1850s in San Bernardino. Almost immediately, Waterman Canyon and Mill Creek were used as logging areas. The mills were small and simple, usually operated by a crew consisting of three to four people. The mills were lucrative and were a primary source of income for the San Bernardino colony. The Mormons maintained control of the mills until they were recalled to Salt Lake Valley in 1857. At that time, many of the mills shut down, while some were sold at a considerably low price. During the 1860s, lumbering in the San Bernardino Mountains stagnated. Only two operations existed throughout most of this period.

There were incidents of hostility due to the continued influx of settlers and lumbering operations. Most notably, the “Battle of Indian Hill” occurred near the present day Lake Arrowhead. Several hundred shots were exchanged, two settlers and six Native Americans were killed, and several people were wounded.

Despite this incident and others like it, lumbering continued in the Western San Bernardino Mountains. Between 1865 and 1895, lumbering reached its peak although most mills were still fairly small operations employing less than 20 men. While there were a large number of mills in the area, they were not all lucrative. The Brookings Lumber Company was a highly mechanized lumbering operation from 1899 to 1912. Its exploitation of the resources was intense and by the time the company ceased operations, over 3000 acres were almost denuded of vegetation. The company also built an extensive system of railroads in the Arrowhead Lake area extending to all of the company’s major logging areas.

Development History

David Noble Smith, an Ohioan in California on a prospecting trip, was the first American to take note of the natural hot springs at the base of Arrowhead in 1851. On this trip, he reputedly vowed to return to the spot to

establish an infirmary, and he ultimately did so in 1863. Smith cleared a road from Waterman Canyon to the spa and constructed the first spa building—a "long shack" according to some accounts—which he opened to the public. The following year, Smith built additional bathing rooms and reservoirs to collect the hot water and opened his "Hot Springs Hygienic Infirmary" for the treatment of consumption. Water from the springs was used in treating tuberculosis. He continued to run the operation for two decades but was forced to lease the property to new owners in 1883. He continued to live nearby until his death in 1885 and is buried on the property where a monument currently stands.

Under new ownership some structures were razed and others improved and expanded. After the existing structure burned to the ground in 1885, a new hotel was built near the springs in 1886. Due to booming tourism spawned by the arrival of the transcontinental railroad in 1883, the owners were able to triple the size of the hotel over the course of the next three years. In 1887, the Arrowhead and Waterman Railway Company was formed to provide rail service from San Bernardino, however the tracks were only laid as far as Patton and the hotel was reached via stage upon arrival at the Arrowhead Station of the Santa Fe Railroad's "Belt Line." Between 1886 and 1894 there were successive owners but the hotel maintained its reputation as a first class resort. Unfortunately the hotel burned in 1895 and the Arrowhead and Waterman Railroad failed in the same year leaving the rail extension to the hotel incomplete. The property remained vacant for the next decade.

A new era for the hotel property began in 1904 with the buy out of the property from its Los Angeles owners by a local San Bernardino businessman, Seth Marshall. Marshall and his investors expanded their holdings in the area to almost 1,800 acres by purchasing the estate of former California Governor Waterman and then constructed another hotel in 1905 that opened for business in 1906. In 1907 The Valley Traction System with Marshall as an investor completed rail service to Arrowhead Springs after buying the rights to the defunct Arrowhead and Waterman Railroad. Seven daily trips were provided to the resort. The company was then sold to the Pacific Electric Railway Company, Southern California's well-known "Red Car" line, which provided scheduled passenger service to Arrowhead Springs until 1932. Marshal established a bottling plant was in the hotel's basement shortly after the hotel opened, utilizing water from Arrowhead Springs. In 1917, the bottling plant was moved to Los Angeles and although the owner sold his interest in the hotel, he kept his rights to the water. In the early 1920s the property was leased by the Veterans Bureau as a rehabilitation hospital for World War I soldiers but returned to Marshall and his investors in 1924. A massive remodeling of the facilities took place prior to reopening to the public in 1925. Varying expansion plans were announced in 1929 and over the next 5-6 years but few of those plans came to fruition except for the construction of some bungalows that were noted in the Los Angeles Times in 1935 as being used by Hollywood stars and writers as offices while vacationing. In 1938 a an aggressive brush fire swept through the hillsides above San Bernardino, destroying the Arrowhead Springs Hotel and many other buildings on the property and the property was subsequently sold to Hollywood investors.

In 1939, construction began on a new hotel and the Arrowhead Springs Corporation was founded whose directors included: Joseph M. Schenck, Jay Paley (President), Darryl Zanuck (Vice President), Edgar J. Mannix, William Goetz (Vice President), Constance Bennett, Lou Anger, J.B. Anger, Claudette Colbert, Al Jolson, and J.B. Codd (Secretary-Treasurer), well known Hollywood residents. Many important designers and architects of that era were known to be involved with the project. For more detail see Appendix C, Volume II. During the gala grand opening many stars made an appearance but despite all the publicity and involvement of celebrities, the hotel failed, closing in the spring of 1941. The hotel open again later that year under new ownership but was soon put into serviced of the country's new war time effort first hosting fund raising events and then as a naval convalescent hospital after purchase by the United States Navy in 1944. In 1946 the Navy returned the hotel to private ownership and after renovation it reopened in 1948, but despite much publicity the hotel never regained its prewar luster.

Over the course of the 1950s, the property entered into a period of constant flux, with various planned improvements, temporary closures and many purchase options on the table every few years including a

1951 purchase by famed hotelier Conrad Hilton. Numerous renovations took place during this time but the hotel closed permanently in 1959 and after a period of vacancy was sold to William Bright of Campus Crusade for Christ International in 1962. Campus Crusade used the hotel as a religious retreat and as a resort and conference center but vacated the property as a headquarters in 1991.

Historic Resources

San Buenaventura Research Associates (SBRA) prepared a Historic Resources Report on the Arrowhead Springs Hotel to determine NRHP and CRHP eligibility of the complex. The Arrowhead Springs Hotel complex is registered as a County Point of Historic Interest (CA-SBR-2268). The following Table 5.4-1 *Potential Historic Resources* summarizes the potential historical resources that currently exist on the project site and Figure 5.4-3, *Arrowhead Springs Buildings, Structures and Object Locations*, illustrates the location of many of these resources.

Table 5.4-1
Potential Historic Resources

Building No.	Name	Historic Period	Date of Construction
1	Hotel/Steam Caves*	1939–1955	1939
2	Pool, Cabanas, Tennis Courts*	1939–1955	1939
3	Bungalow 1*	1904–1938	c. 1929
4a	Bungalow 3*	1904–1938	c. 1936; c. 1939
4b	Bungalow 4*	1904–1938	c. 1936
4c	Bungalow 5*	1904–1938	c. 1936
4d	Bungalow 6*	1904–1938	c. 1936
5	Bungalow 7*	1904–1938	c. 1936
6	Bungalow 8*	1904–1938	c. 1936
7	Bungalow 9*	1904–1938	c. 1936
8	Bungalow 10*	1904–1938; 1938–1955	c. 1929, c. 1940
9	Mud Baths*	1904–1938 ?	Before 1931
10	Garage (Hill Auditorium)	1939–1955	c. 1939
11	Hacienda	1939–1955	Uncertain
12	Smith Memorial*	1863–1883; 1883–1895	c. 1875-1885
13	Indian Statue*	1904–1938	1924
14	Spring House	1939–1955	c.1945
15	Quonset Huts	1939–1955	c.1945
16	Reservoir*	Uncertain	Uncertain
17	Springs*	Uncertain	Uncertain
18	Fountains*	1904–1938	c. 1904
19	Terrace and Tennis Courts*	1904–1938	c. 1925
20	Arrowhead Pool	–	1957
21	Maintenance Buildings	–	After 1962
22	Chapel	–	1969
23	Bungalow 11	–	1982
24	Sierra Room	–	1982
25	Outdoor Theater	–	After 1962
26	Village Complex/Creekside Lodge	–	1968, 1983
27	Canyon View Offices	–	1968-1969

Table 5.4-1
Potential Historic Resources

Building No.	Name	Historic Period	Date of Construction
28	Lake Vonnette	–	After 1962
29	Sewer Plant	–	After 1962
–	Landscape Elements*	Various	Various
–	Miscellaneous Features*	Various	Various

*Eligible elements for listing on the NRHP and CRHP.

The majority of buildings in Table 5.4-1, *Potential Historic Resources,* and Figure 5.4-3, *Arrowhead Springs Buildings, Structures, and Object Locations,* above were less than 50 years of age at the time of the Historic Resources Report, and consequently were not subject to further eligibility evaluation. Buildings at least 50 years of age, or those previously determined to be eligible for preservation were evaluated in detail in the Historic Resources Report (Volume III, Appendix C). Buildings determined to be eligible are briefly described as follows with map reference number noted:

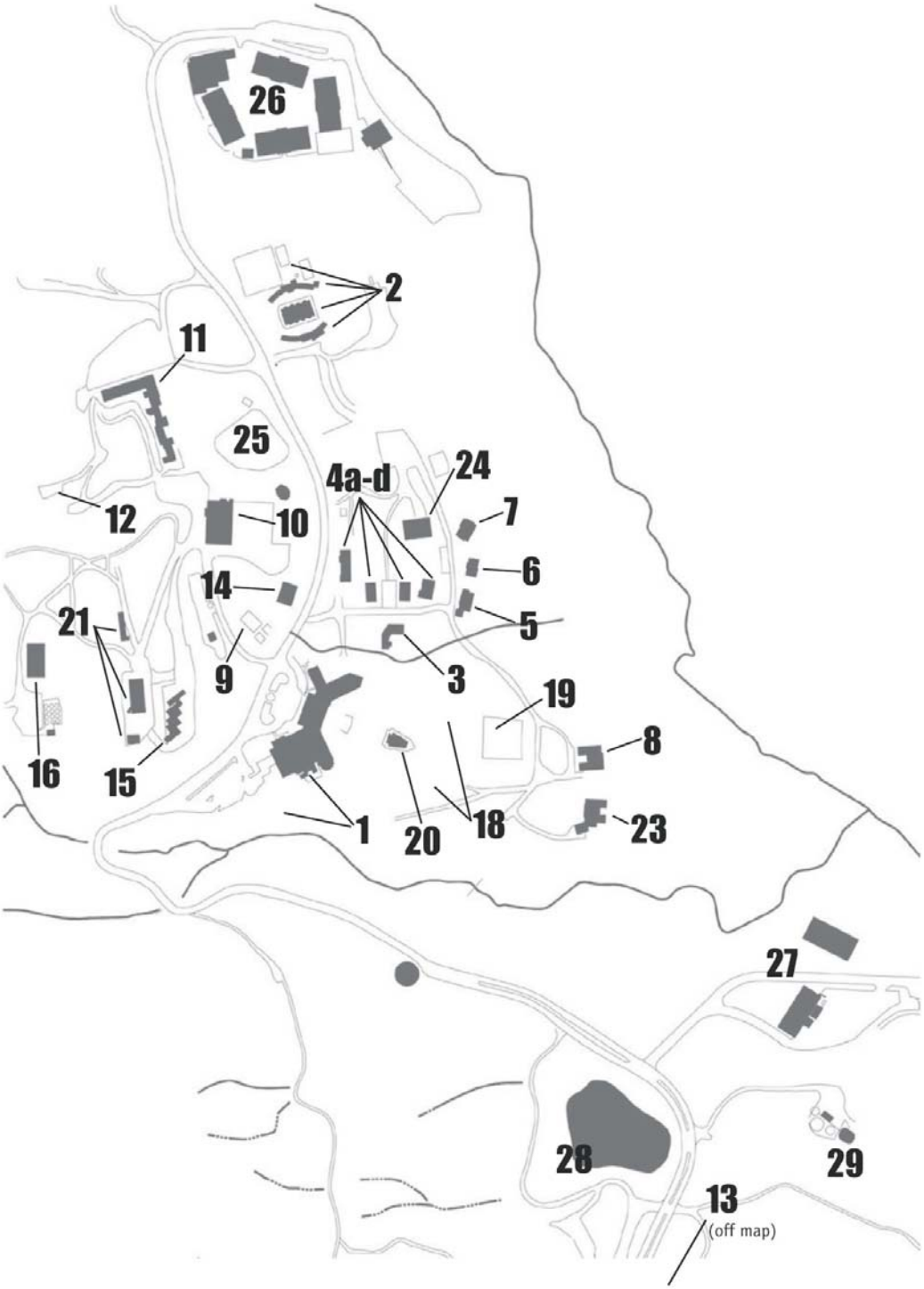
Arrowhead Springs Hotel (#1): The hotel building is roughly an "X" in plan and consists of a central mass six stories in height flanked by one, two and four-story wings projecting at obtuse angles, opening towards the north and south. The central mass is stepped and terminates in a truncated hipped roof topped by cresting. The wings feature flat, parapeted roofs. The building is constructed of poured-in-place concrete. The hotel building features two prominent elevations, northern and southern. The northern elevation is characterized by a neoclassical two-story main entrance centered on the elevation. Projecting to the east of the northern elevation is the one-story theater wing. The southern elevation of the hotel features two, four-story guest room wings projecting at an obtuse from the building's six-story central mass. The Steam Caves are located near the bottom of the West Fork of Hot Water Canyon, immediately to the west of the hotel, and are accessed by means of an elevator. They consist of semicircular flagstone masonry walls constructed on benches on the canyon sides. Concrete tunnels extend into the hillside.

Ground was broken for the construction of the hotel in January, 1939 and it was opened to the public the following December. The building was designed by the important Los Angeles architects Gordon Kaufmann and Paul Williams. The interiors of the hotel, including the pillared lobby and ornate dining areas and bar, as well as many of the furnishings, were designed by Dorothy Draper and Company of New York. Known alterations to the hotel include the enclosure of the semicircular portico on the southern end of the lobby to create a cocktail lounge in 1951. Other renovations to the interior also occurred during the early 1950s, the precise extent of which is not currently known. The Steam Caves area has been considerably impacted by brush fires, which have destroyed the frame portions of this feature.

Pool and Cabanas (#2): The pool area consists of a large concrete swimming pool flanked by two cabana buildings. The brick and frame cabanas, located on the east and west sides of the pool, feature a center locker room pavilion flanked by cabana rooms opening towards the pool. Above and to the north of the pool is a terrace and stairway. Tennis courts are located nearby to the east. The pool area was constructed in 1939, along with the hotel. The only known alterations are the removal of three diving boards, including a stylish concrete high-dive, from the southern end of the pool.

Bungalow 1 (#3): This one-story wood-frame residence is roughly a U-plan enclosing a large terrace opening towards the south and features stucco-clad walls and a Spanish tile roof. This building was probably constructed circa 1929, in connection with the plans for expansion of the hotel facilities announced for that year. The designer of the building is not known. It appears to be essentially unaltered.

Buildings, Structures and Object Locations



NOT TO SCALE

Source: American Development Group/
San Buenaventura Research Associates

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Bungalows 3, 4, 5, and 6 (#4a, 4b, 4c, 4d): These one-story, stucco-clad, wood-frame residences are irregular in plan and feature gable roofs covered with Spanish tile. Windows are mainly steel casements. They are similar in design, and were probably all constructed circa 1936 in connection with the announced intention to build six new bungalows that year. The designer is not known. They are mainly unaltered, with the notable exception of the later enclosure of the south-facing sun rooms to create kitchens, and a variety of small room additions. These alterations probably occurred when they were converted from hotel rooms to full-time residences during the 1960s or 1970s. Bungalow No. 3 appears to have been moved to its current site from its original location, roughly 100 feet to the northwest, probably when the existing access road on the north side of the hotel was constructed in 1939.

Bungalow 7 (#5): This one-story, stucco-clad, wood-frame residence is irregular in plan and features a side-facing gable roof covered with Spanish tile. It was probably constructed circa 1936, as one of the six bungalows scheduled for construction that year. The designer is unknown. Apparent alterations included the enclosure of porches and sun rooms on the southern elevation, evidently prior to 1950, and the likely conversion of an attached two-car garage to living space, probably during the 1960s or 1970s. The 1950 Sanborn Map of the property labels this building as the "Pike Bungalow." The historical associations of this name are not currently known, but this reference suggests that this building was utilized as a residence for a hotel employee, rather than as guest quarters.

Bungalow 8 (#6): This one-story, stucco-clad, wood-frame residence is irregular in plan and features a side-facing gable roof covered with Spanish tile. Windows are mainly steel casements. It was probably constructed circa 1936, as one of the six bungalows scheduled for construction that year. The designer is unknown. Apparent alterations included the enclosure of a porch on the southern elevation, evidently prior to 1950. The 1950 Sanborn Map of the property labels this building as the "Martin Bungalow." The historical associations of this name are not currently known, but this reference suggests that this building was utilized as a residence for a hotel employee, rather than as guest quarters.

Bungalow 9 (#7): This one-story, stucco-clad, wood-frame residence is irregular in plan and features a hip roof covered with Spanish tile. It was probably constructed circa 1936, as one of the six bungalows scheduled for construction that year. The designer is unknown. Apparent alterations included the enclosure of a porch on the southern elevation to create a kitchen, evidently during the 1960s or 1970s. The 1950 Sanborn Map of the property labels this building as the "Fichett Bungalow." The historical associations of this name are not currently known, but this reference suggests that this building was utilized as a residence for a hotel employee, rather than as guest quarters.

Bungalow 10 (#8): This one-story, stucco-clad, wood-frame residence in an H-plan features intersecting hip roofs covered with Spanish tile and a landscaped entry courtyard featuring a Mexican tiled, octagonal fountain on the northern side. It was probably constructed circa 1929, in connection with the plans for expansion of the hotel facilities announced for that year. Architectural evidence, primarily on the interior, suggests it was remodeled circa 1940. The original designer of the building is not known, but the alterations may have been designed by Paul Williams or Gordon Kaufmann, the architects for the 1939 hotel. Apparent alterations afterwards included the enclosure of a porch on the southern elevation, probably after 1950. The 1950 Sanborn Map of the property labels this building as the "Schenck Bungalow," suggesting it was used by 20th Century Fox chairman Joseph M. Schenck, one of the principal investors in the 1939 hotel, rather than as guest quarters.

Mud Baths (#9): The mud baths are composed of several structures. Most prominent of these is a shallow, rectangular basin with a concrete floor and mortared stone walls supported by shallow buttresses. Within the basin are a number of stone columns, which presumably supported catwalks, which are no longer extant. The function of these facilities was to heat therapeutic muds with hot spring water. After 1939, these muds were transported into the hotel, where they filled concrete treatment tubs used by the guests. The date of this feature could not be definitively determined. Hot mud baths were located in this approximate location at least

as early as 1894, and similar features are pictured in early hotel literature, so it could conceivably date in whole or part from either the 1888-1895 or the 1904-1938 hotel periods.

Garage (Hill Auditorium) (#10): This one-story wood-frame building with a truss roof covered with rolled roofing is rectangular in plan. Two large wing walls project from the western elevation, forming a forecourt covered by an attached wood-frame pergola. The first garages known to have been constructed at the Arrowhead Springs Hotel were built circa 1925, near the beginning of the automobile era at the hotel. These buildings, which were probably wood-frame construction and located on or near the present garage building site, were probably lost in the 1938 fire. The present building was probably constructed in 1939 to replace it. The designer is unknown. The building was apparently converted to an auditorium use in 1958 and altered again in 1990, at which time the forecourt was presumably added.

Hacienda (#11): This one-story, stucco-clad, wood-frame residence building is constructed in roughly an L-plan. It cannot be definitely shown to have existed at its current location prior to 1950, although the architectural and historical evidence suggests an earlier date of construction. It was likely to have been constructed by combining a number of buildings salvaged from other locations. During the U.S. Navy's occupation of the hotel (1944-46), this building was used as officer's quarters. Clearly discernible recent alterations include the replacement of many windows with modern aluminum sliders.

Smith Memorial (#12): This small cemetery consists of a marble obelisk on a granite base surrounded by three head-stones. This is the burial site of David Noble Smith (1831-85), the founder of Smith's Infirmary and the first to construct a spa on the site of Arrowhead Springs. Also buried here are his daughter Mary Amaret Smith (1878-1881) and a friend, Frank B. Stebbins (1845-1875). The date the cemetery was established is not known, but it may be presumed that it began with the death of Stebbins in 1875 and the marker erected shortly after David Smith's death in 1885. The shaft of the obelisk has apparently been broken at least twice and repaired.

Indian Statue (#13): This 13-foot-high statue of an American Indian is cast of concrete and rests on a concrete block platform. The sculptor was J.L. Root, about whom nothing is presently known. Originally designed to be integrated into a stone archway spanning the roadway at the entrance to the hotel grounds in 1924, it was moved to its current location in 1976.

Spring House (#14): This one-story, wood-frame, stucco-clad building features a flat roof and a small covered entry porch supported by wood posts on the northern elevation. The windows are wood frame. The date of construction for this building is uncertain, but based on the architectural evidence it was likely constructed by the U.S. Navy during its use of the property, 1944–46. It was probably constructed roughly 300 feet to the north of its present location and moved to its current site after 1950. It appears to be moderately altered, with the enclosure of window and door openings, and possibly stucco over original wood cladding.

Quonset Huts (#15): This is a grouping of five small corrugated steel buildings organized in an attached, sawtooth pattern. Their date of construction is uncertain, but based on the architectural evidence, they were likely constructed by the by the U.S. Navy during its use of the property, 1944–46. They were probably constructed roughly 300 feet to the south of their present locations as detached buildings and moved to the current site after 1950. The doorways on the southern elevations appear to be somewhat altered, and the buildings have been sprayed with a texture coating material.

Reservoir (#16): This water storage structure is rectangular in plan and covered with a wood-frame side-facing gable roof. The date of construction is uncertain, but this site has been the location of the hotel's domestic water supply storage since at least 1931. The current improvements probably date from 1939.

Landscape Elements and Miscellaneous Features

Although the most prominent feature of the Arrowhead Springs property is the 1939 hotel, the property should be understood as an evolving historical landscape, the product of approximately 140 years of historical use. The large number of buildings, structures and objects distributed throughout the property makes the creation of a complete accounting of these features at this level of investigation problematic. Further, given the limited historical documentation currently available, particularly from the earlier periods of habitation and use, dates of construction for many of these features are difficult to establish confidently. These features include landscape elements, fountains, springs, water features, tennis courts, Arrowhead pool now filled with soil, and landscape elements.

A substantial number of additional features, potentially built during historic periods, are located throughout the property. These features include walls, roads, gutters and small buildings. Due to the size, terrain and overgrown nature of the property, not all of these buildings and structures could be readily cataloged and dated, or in some cases, observed. Therefore, the existence of some should be regarded as unverified. In particular, a small passenger shelter is known to have existed until at least recently in the vicinity of the terminus of the Arrowhead Springs Pacific Electric line. This structure could not be located in field surveys, but if it remains, would probably represent the last artifact from the rail line which provided access to the hotel grounds for over 25 years. An outdoor fireplace/bar-b-cue is located west of the pool/tennis courts feature. It is of indeterminate age and origin.

Eligibility of Arrowhead Springs Historic Resources

The California Environmental Quality Act (CEQA) requires evaluation of project impacts on historic resources, including properties "listed in, or determined eligible for listing in, the California Register of Historical Resources [or] included in a local register of historical resources." By definition, the California Register of Historical Resources also includes all "properties formally determined eligible for, or listed in, the National Register of Historic Places," and certain specified State Historical Landmarks. The majority of "formal determinations" of NRHP eligibility occur when properties are evaluated by the State Office of Historic Preservation in connection with federal environmental review procedures (Section 106 of the National Historic Preservation Act of 1966). Formal determinations of eligibility also occur when properties are nominated to the NRHP, but are not listed due to owner objection. The criteria for determining eligibility for listing on the National Register of Historic Places (NRHP) have been developed by the National Park Service. Properties may qualify for NRHP listing if they:

A. are associated with events that have made a significant contribution to the broad patterns of our history; or

B. are associated with the lives of persons significant in our past; or

C. embody the distinctive characteristics of a type, period, or method of construction or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

D. have yielded, or may be likely to yield, information important in prehistory or history.

According to the National Register of Historic Places guidelines, the "essential physical features" of a property must be present for it to convey its significance. Further, in order to qualify for the NRHP, a resource must retain its integrity, or "the ability of a property to convey its significance."

The seven aspects of integrity are: Location (the place where the historic property was constructed or the place where the historic event occurred); Design (the combination of elements that create the form, plan, space, structure, and style of a property); Setting (the physical environment of a historic property); Materials

(the physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration to form a historic property); Workmanship (the physical evidence of the crafts of a particular culture or people during any given period of history or prehistory); Feeling (a property's expression of the aesthetic or historic sense of a particular period of time), and; Association (the direct link between an important historic event or person and a historic property).

The relevant aspects of integrity depend upon the National Register criteria applied to a property. For example, a property nominated under Criterion A (events), would be likely to convey its significance primarily through integrity of location, setting and association. A property nominated solely under Criterion C (design) would usually rely primarily upon integrity of design, materials and workmanship. The California Register procedures include similar language with regard to integrity. The minimum age criterion for the National Register of Historic Places (NRHP) and the California Register of Historical Resources (CRHR) is 50 years. Properties less than 50 years old may be eligible for listing on the NRHP if they can be regarded as "exceptional," as defined by the NRHP procedures, or in terms of the CRHR, "if it can be demonstrated that sufficient time has passed to understand its historical importance" [Chapter 11, Title 14, §4842(d)(2)].

Historic resources as defined by CEQA, also includes properties listed in "local registers" of historic properties. A "local register of historic resources" is broadly defined in §5020.1 (k) of the Public Resources Code, as "a list of properties officially designated or recognized as historically significant by a local government pursuant to a local ordinance or resolution." Local registers of historic properties come essentially in two forms: (1) surveys of historic resources conducted by a local agency in accordance with Office of Historic Preservation procedures and standards, adopted by the local agency and maintained as current, and (2) landmarks designated under local ordinances or resolutions. These properties are "presumed to be historically or culturally significant...unless the preponderance of the evidence demonstrates that the resource is not historically or culturally significant." (Public Resources Code §§ 5024.1, 21804.1, 15064.5)

National and California Registers

Significance

The Arrowhead Springs property is eligible for the NRHP and under Criterion A and the CRHR under Criterion 1 (significant historical events) for its association with the "health seeker" movement, an important historical and cultural developmental theme in Southern California, which was driven in large part by the railroad inspired real estate boom of the late 1880s. As an important regional resort, it likewise played an important role in the physical, social and economic development of the San Bernardino region. During its most recent historic developmental phase, the 1939–1955 era, the property was closely associated with the regionally important Southern California entertainment industry, becoming, if only briefly, one the Hollywood culture's more far-flung outposts.

The property does not appear to be potentially eligible under NRHP Criterion B and CRHR Criterion 2 (lives of persons significant in our past). Although a number historically significant individuals are associated with the property, the property does not appear to have played a notable or important role in the lives of these individuals or is representative of their contributions or accomplishments.

The Arrowhead Springs property is eligible for the NRHP eligible under Criterion C and the CRHR under Criterion 3 (design and construction), for its association with four master designers: Paul R. Williams, Gordon B. Kaufmann, Edward Huntsman-Trout and Dorothy Draper. Williams and Kaufmann were among a relatively small group of Southern California architectural practitioners during the 1920s and 1930s to be closely identified with the evolution and development of a Southern California regional architectural style. Although the work of landscape architect Edward Huntsman-Trout is not as fully documented, he is counted among the pioneers in regional landscape design. When the firm was awarded the commission to design the interiors of the Arrowhead Springs Hotel, Dorothy Draper and Company of New York was entering a period

of considerable notoriety which began with the Hampshire House hotel project in New York City in 1937. Arrowhead Springs was the firm's first commission in California, and one of only three known in the state. The other two projects, the Fairmont and Mark Hopkins hotels in San Francisco, were undertaken during the 1940s. Draper was likely chosen for the Arrowhead Springs project because of her recently-established reputation as a designer, and because her trademark free-historical style melded particularly well with the similar approach to historicism characterizing Paul Williams' work during the period. National Register Criterion D (CRHR 4) refers to archeology, and therefore does not apply to this evaluation.

Eligibility

Buildings, structures and objects contributing to this eligibility are listed and noted with an asterisk (*) in Table 5.4-1 above. The period of significance for the property begins with David Noble Smith's initial efforts to develop a spa on the property in 1863, to 1955, fifty years ago as of this writing. All features constructed during the period of significance, as well as those listed in Table 5.4-1 as "uncertain" and "various" should be regarded as eligible for purposes of the environmental analysis. Ineligible elements include those which are currently less than 50 years of age, and those which should be regarded as ineligible due to alterations.

Properties Less Than 50 Years of Age

Properties less than 50 years of age may be eligible if they can be found to be "exceptional." While no hard and fast definition for "exceptional" is provided in the NRHP literature, the special language developed to support nominating these properties was clearly intended to accommodate properties which demonstrate a level of importance such that their historical significance can be understood without the passage of time. In general, according to NRHP literature, eligible "exceptional" properties may include, "resources so fragile that survivors of any age are unusual. [Exceptionalness] may be a function of the relative age of a community and its perceptions of old and new. It may be represented by a building or structure whose developmental or design value is quickly recognized as historically significant by the architectural or engineering profession [or] it may be reflected in a range of resources for which the community has an unusually strong associative attachment." None of the subject properties in the study area appear to rise to the exceptional level.

Integrity

The integrity of location for Arrowhead Spring property is intact; two small buildings have apparently been moved, but only slightly and within their historical settings. The integrity of design of the property is very good. The historical physical relationships between the individual elements, dominated by the hotel building but not limited to it, remain intact. The design integrity of some of the individual elements are somewhat compromised, but mainly without a loss of their essential character-defining features or their spatial relationships within the property as a whole. The mountainous setting for the property is almost entirely intact. Few encroachments by recent urban development which characterizes the San Bernardino area are in evidence on the Arrowhead Springs property. To the extent that the buildings on the property exhibit design integrity, their integrity of materials and workmanship are also intact. The integrity of feeling and association of the property is somewhat compromised, given that the property is no longer used for its original purpose. On a whole, the Arrowhead Springs property appears to possess sufficient integrity to be eligible for listing on the NRHP and CRHR under criteria A and C, and 1 and 3, respectively.

Native American Historic Resources

The Arrowhead Springs Specific Plan area was historically a boundary region among three Native American groups known as the Gabrielino, Serrano, and the Cahuilla. Although these groups subsisted primarily through hunting and gathering, there is some evidence that the Cahuilla practiced limited agriculture. Corn, beans, squashes, and melons, possibly acquired through contact with the Colorado River cultures, were planted and harvested. The Gabrielino, Serrano, and Cahuilla all maintained permanent villages and moved

to temporary camps in order to hunt and gather food resources. The permanent camps as well as the temporary camps were usually situated near water sources.

Locally, Arrowhead Springs was occupied at various times by each of the groups. The Native Americans considered hot springs sacred and powerful; however, Arrowhead Hot Springs were considered particularly sacred because of the arrowhead shaped geologic formation pointing to the springs. The Gabrielino refer to the hot springs as an ancestral campground. The Cahuilla and Serrano refer to this area in many of their stories. The Cahuilla called the Arrowhead Hot Springs Hutratam and the Gabrielino referred to the place as Nilrngla.

Archaeological Resources

Areas of concern for archaeological sensitivity within San Bernardino are depicted in Figure 5.4-2. The figure contains areas of known resources or reasonably could contain resources and which had demonstrable surface integrity as of November 1987. The Arrowhead Springs Specific Plan Area has been identified as an "area of concern" for Archaeological Resources based on the area's history of use by various Native American groups.

A record search of the San Bernardino Information Center located at the San Bernardino County Museum revealed that eight cultural resources studies, including five overview reports pertaining to the Arrowhead Springs area. A list of previous studies can be found on page 8 of the SWCA report (Volume III, Appendix C). According to the cultural resources files at the San Bernardino Information center, one prehistoric archaeological site, nine historic archaeological sites, three "pending" historic archaeological sites, four historic structures and four (plus) possible historic structures are recorded within the Arrowhead Springs area. The Arrowhead Springs Hotel complex (CA-SBR-2268) is also registered as a County Point of Historic Interest.

The Arrowhead Springs property contains 15 previously recorded cultural resources. In January of 2005, SWCA Environmental Consultants conducted a field inventory to confirm the location of these 15 previously recorded sites. During the field work, SWCA identified and recorded five additional resources. The Arrowhead Springs Hotel complex contains multiple known historic features and the possibility that many remains related to the early historic and prehistoric occupations are still buried. The property manager had discovered the ruins of a gazebo under 6 meters (approximately 20 feet) of fill material indicating that historic and/or prehistoric remains could still be found in-situ beneath the surface. The following Table 5.4-2 is a summary of the Arrowhead Springs Archaeological Sites. A detailed description of each site can be found in SWCA Archaeological Survey located in Volume III, Appendix C.

Table 5.4-2
Summary of Arrowhead Springs Archaeological Sites

Site Number	Description
CA-SBR-2268	Location of prehistoric and historic village of *Nilengla*, as well as the historic Arrowhead Springs hotel sites.
	Gazebo, once located on the front lawn of the hotel.*
	Bathing Area and associated stairs and retaining wall at the bottom of the creek, just west of the hotel.*
	Barbeque and historic era trash*
	Historic era trash and possible foundation remains*
	Mano (A hand-held stone or roller for grinding corn or other grains)*
CA-SBR-6869H	Oven/chimney and foundation with an associated historic trash pit.
CA-SBR-6870H	Concrete road bridge
CA-SBR-7019H	Stone and concrete conduit (gutter) and Holding tanks
CA-SBR-7020H	Retaining wall, steps, no foundation of former house site.
CA-SBR-7021H	Possible remains of 1885 Del Rosa Water Company trench

Table 5.4-2
Summary of Arrowhead Springs Archaeological Sites

Site Number	Description
CA-SBR-7022H	Retaining walls of former house, some trash
CA-SBR-7049H	Rim of the World Highway
CA-SBR-7702H	Eight structural features
CA-SBR-8248H	Retaining walls, trash, historic features
CA-SBR-10795H	1940s to 1060s trash
P1071-21	1890 Stone Ditch tunnel
P1071-27	Adobe house with add-on's
P36-017732	1850–1860 rock and concrete flume
P36-020267	Historic era culvert

*Newly recorded "loci" based on SWCA January 2005 Survey

5.4.2 Thresholds of Significance

CEQA Guidelines Section 15064.5 provides directions on determining significance of impacts to archaeological and historical resources. Typically a resource shall be considered "historically significant" if the resource meets the criteria for listing, including the following:

- Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
- Is associated the with lives of persons important in our past;
- Embodies the distinctive characteristics of a type, period, region or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
- Has yielded, or may be likely to yield, information important in prehistory or history.
- The fact that a resource is not listed in, or determined to be eligible for listing in the California Register of Historical Resources, or is not included in a local register of historical resources, does not preclude a lead agency from determining that the resource may be an historical resource.

The following information excerpted from the most recent update of the CEQA guidelines provides criteria on how to determine the significance of impacts to cultural resources:

§15064.5 Determining the Significance of Impacts to Archeological and Historical Resources

(b) A project with an effect that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment.

(1) Substantial adverse change in the significance of an historical resource means physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired.

(2) The significance of an historical resource is materially impaired when a project:

(A) Demolishes or materially alters in an adverse manner those physical characteristics of an historical resource that convey its historical significance and that justify its inclusion in, or eligibility for, inclusion in the California Register of Historical Re-sources; or

(B) Demolishes or materially alters in an adverse manner those physical characteristics that account for its inclusion in a local register of historical resources pursuant to section 5020.1(k) of the Public Resources Code or its identification in an historical resources survey meeting the requirements of section 5024.1(g) of the Public Resources Code, unless the public agency reviewing the effects of the project establishes by a preponderance of evidence that the resource is not historically or culturally significant; or

(C) Demolishes or materially alters in an adverse manner those physical characteristics of a historical resource that convey its historical significance and that justify its eligibility for inclusion in the California Register of Historical Resources as determined by a lead agency for purposes of CEQA.

(3) Generally, a project that follows the Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings or the Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings (1995), Weeks and Grimmer, shall be considered as mitigated to a level of less than a significant impact on the historical resource.

According to Appendix G of the CEQA Guidelines, a project would normally have a significant effect on the environment if the project would:

C-1 Cause a substantial adverse change in the significance of an historical resource pursuant to Section 15064.5

C-2 Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5

C-3 Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

C-4 Disturb any human remains, including those interred outside of formal cemeteries.

5.4.3 Environmental Impacts

The following impact analysis addresses thresholds of significance for which the Initial Study, included as Appendix A in Volume I, disclosed potentially significant impacts. The applicable thresholds are identified in parentheses after the impact statement.

5.4.3.1 San Bernardino General Plan

GP IMPACT 5.4-1: BUILD-OUT OF THE SAN BERNARDINO GENERAL PLAN COULD RESULT IN THE LOSS OF POTENTIALLY HISTORIC STRUCTURES. [THRESHOLD C-1]

Impact Analysis: Historians consider the City of San Bernardino, especially areas depicted in Figure 5.4-1, as being historically significant. Adoption of the General Plan in itself would not directly affect any historical structures. However, build-out of the General Plan over the long term would allow development and redevelopment to occur in historically sensitive areas. The General Plan contains goals and policies that specifically address sensitive historical resources and their protection if they are encountered during any development activity. The City of San Bernardino adopted a Historic Building Preservation Ordinance in 1989. The ordinance establishes criteria for evaluating demolition permits for buildings 50 years or older in an effort to preserve structures with historical value. In addition, review and protection are afforded by CEQA for those projects subject to discretionary action, particularly for historical structures and resources. Nevertheless, impacts from the build-out of the General Plan could be significant. Therefore, mitigation is

recommended to ensure significant impacts to previously identified and unidentified historical resources are avoided.

GP IMPACT 5.4-2: BUILD-OUT OF THE GENERAL PLAN COULD IMPACT SENSITIVE ARCHAEOLOGICAL RESOURCES, PALEONTOLOCAL RESOURCES, OR A UNIQUE GEOLOGIC FEATURE. [THRESHOLDS C-2 AND C-3]

Impact Analysis: Archaeologists and ethnologists consider the City of San Bernardino, especially the areas depicted in Figure 5.4-2 as being archeologically sensitive. Adoption of the General Plan in itself would not directly affect any archeological or paleontological resources. However, long-term implementation of the General Plan land use policy could allow development and redevelopment, including grading, of sensitive areas. The General Plan contains goals and policies that specifically address sensitive archeological resources and their protection if they are encountered during any development activity. In addition, review and protection are afforded by CEQA for those projects subject to discretionary action, particularly for archeological, paleontological, and unique geologic resources. Nevertheless, impacts from the build-out of the General Plan could be significant. Therefore, mitigation is recommended to ensure significant impacts to previously identified and unidentified archeological, paleontological, and unique geologic resources are avoided.

GP IMPACT 5.4-3: GRADING ACTIVITIES COULD POTENTIALLY DISTURB HUMAN REMAINS. [THRESHOLD C-4]

Impact Analysis: Adoption of the General Plan in itself does not involve grading activities and would not directly disturb any human remains. However, long-term implementation of the General Plan land use policy could allow development and redevelopment, including grading, of sensitive areas thereby disturbing human remains. Review and protection are afforded by CEQA for those projects subject to discretionary action, particularly for activities that could potentially disturb human remains. Nevertheless, impacts from the build-out of the General Plan could be significant. Therefore, mitigation is recommended to reduce the General Plan update's potential impact to human remains to less than significant.

Relevant General Plan Policies and Programs

The following City of San Bernardino General Plan policies and programs related to cultural resources include:

Policy 11.1.1: Develop a comprehensive historic preservation plan that includes:

- Adoption of a Preservation Ordinance that authorizes the City to designate resources deemed to be of significance as a City Historical landmark or district.
- Establishment of a Historic Resources Commission that will review and recommend preservation ordinances, design standards, and historical designations of resources.
- Adoption of the Secretary of Interior Standards for Historic Rehabilitation and the standards and guidelines as prescribed by the State Office of Historic Preservation as design standards for alterations to historic resources.
- Establishment of a design review process for potential development projects in or adjacent to Historic Preservation Overlay Zones.

Policy 11.1.2: Maintain and update the Historic Resources Reconnaissance Survey database files of historic, architectural, and cultural resources conducted in 1991, and integrate it into the City's ordinance and environmental review process.

Policy 11.1.3: Consider, within the environmental review process, properties that may have become historically significant since completion of the survey in 1991.

Policy 11.1.4: Compile and maintain an inventory, based on the survey, of the Planning Area's significant historic, architectural, and cultural resources.

Policy 11.1.5: Continue to adopt historic district and overlay zone ordinances as described in the Historic Resources Reconnaissance Survey Report. Consider the designation of Historic Districts and Historic Overlay Zones as described in the Historic Resources Reconnaissance Survey Report.

Policy 11.1.6: Consider the need for a comprehensive survey for Downtown as well as establishing priorities for future intensive-level surveys.

Policy 11.1.7: Require that all City-owned properties containing or adjacent to historic resources be maintained in a manner that is aesthetically and/or functionally compatible with such resources.

Policy 11.1.8: Continue to develop design standards for commercial areas, similar to those in the Main Street Overlay District, which promotes the removal of tacked-on facades and inappropriate signage, the restoration of original facades, and designs that complement the historic pattern.

Policy 11.1.9 Require that an environmental review be conducted on all applications (e.g. grading, building, and demolition) for resources designated or potentially designated as significant in order to ensure that these sites are preserved and protected. (LU-1)

Policy 11.2.1: Encourage owners of historic income-producing properties to use the tax benefits provided by the 1981 Tax Revenue Act or as may be amended.

Policy 11.2.2: Encourage the use of the Historic Building Code in order to provide flexibility in building code requirements for the rehabilitation of historic buildings.

Policy 11.2.3: Provide for the purchase of facade easements from private property owners; allow private nonprofit preservation groups to purchase facade easements. A historic easement would include any easement, restriction, covenant or condition running with the land designed to preserve or maintain the significant features of such landmarks or buildings.

Policy 11.2.4: Adopt the Mills Act program to allow for a reduction in property taxes for historic properties.

Policy 11.3.1: Promote the formation and maintenance of neighborhood organizations and foster neighborhood conservation programs, giving special attention to transitional areas.

Policy 11.3.2: Develop brochures to accommodate pedestrian and vehicular tours of historic buildings, landmarks, neighborhoods and other points of historical interest in the San Bernardino area.

Policy 11.3.3: Cooperate with local historic preservation organizations doing preservation work and serve as liaison for such groups.

Policy 11.3.4: Encourage the involvement of San Bernardino City Unified School District, private schools, adult education classes, California State University at San Bernardino, the San Bernardino County Museum, San Bernardino Valley College in preservation programs and activities.

Policy 11.4.1: Encourage the preservation, maintenance, enhancement, and reuse of existing buildings in redevelopment and commercial areas; the retention and renovation of existing residential buildings; and the relocation of existing residential buildings when retention on-site is deemed not to be feasible.

Policy 11.4.2: Consider creating a program to relocate reusable older buildings from or into redevelopment projects as a means of historic preservation.

Policy 11.4.3: Utilize the Redevelopment Agency as a vehicle for preservation activity. The Agency is currently empowered to acquire, hold, restore, and resell buildings.

Policy 11.5.1: Complete an inventory of areas of archaeological sensitivity in the planning area.

Policy 11.5.2: Develop mitigation measures for projects located in archaeologically sensitive areas to protect such locations, remove artifacts, and retain them for educational display.

Policy 11.5.3: Seek to educate the general public about San Bernardino's archaeological heritage through written brochures, maps, and reference materials.

The City of San Bernardino Historic Depot District Concept Improvement Plan.

5.4.3.2 Arrowhead Springs Specific Plan

The following impact analysis addresses thresholds of significance for which the Initial Study, included in Volume II, Appendix A, disclosed potentially significant impacts. The applicable thresholds are identified in parentheses after the impact statement.

AHS IMPACT 5.5-1: BUILD-OUT OF THE ARROWHEAD SPRINGS SPECIFIC PLAN WOULD IMPACT AN IDENTIFIED HISTORIC RESOURCE. [THRESHOLD C-1]

Impact Analysis: According to the Arrowhead Specific Plan, "... the hotel will be renovated to its original splendor in keeping with its 1940-50s Art Deco/Dorothy Dreper [sic] style." The specific approach and the standards to be utilized in connection with this renovation effort are not spelled out in the Arrowhead Specific Plan. Further, unlike "rehabilitation" and "preservation," the term "renovation" has no generally understood definition or meaning within the practice of historic preservation. Consequently, the language within the Specific Plan is insufficient to conclude that the exterior and interior historic architectural features of the hotel and Steam Caves would be preserved and missing and/or damaged features restored in an historically appropriate manner, which may lead to a loss of design integrity for the building.

The land use and circulation plans for the project call for the introduction of several new roads and bridges on the Arrowhead Springs property. The development standards contained within the Specific Plan, although not final in nature, suggest that existing roads, where utilized, would be widened and reconstructed in accordance with standard engineered City of San Bernardino cross-sections, resulting in significant alterations to the existing informal historical character of the roadways which currently lack curbs and in some instances include stone and concrete gutter systems.

The Specific Plan specifies the construction of numerous additional facilities in connection with the development of the hotel and a conference center. These plans call for "a new 115-room Annex [to] be constructed nearby" and "In addition to the existing 10,000 square foot conference facility inside the existing hotel, a new state-of-the-art 25,000 square foot Conference Center and associated meeting facilities will be constructed." The location and design of these new facilities are not specified in the Master Plan, but it can be assumed that they would be located in close proximity to the historic hotel building, and potentially, on a site that may contain other historic architectural and landscape features, which may lead to a loss of design and setting integrity for the hotel and design integrity for the property as a whole.

The proposed land use plan would result in the demolition of Bungalows 3, 7, 8, 9, 10, and 11, buildings which contribute to the historical significance of the property. The demolition of an historic property cannot be seen as conforming with the *Secretary of the Interior's Standards*.

The proposed Specific Plan would also result in the introduction of land uses in close proximity to historic features, which would substantially alter the existing historic and natural setting of the Arrowhead Springs property.

The CEQA Guidelines require a project which will have potentially adverse impacts on historic resources to conform to the *Secretary of the Interior's Standards for the Treatment of Historic Properties*, in order for the impacts to be mitigated to below significant and adverse levels. As mentioned above, adhering to the *Standards* is the only method described within CEQA for reducing project impacts on historic resources to less than significant levels. However, CEQA also mandates the adoption of feasible mitigation measures which will reduce adverse impacts, even if the residual impacts after mitigation remain significant. Means other than the application of the *Standards* would necessarily be required to achieve this level of mitigation. In determining what type of additional mitigation measures would reduce impacts to the greatest extent feasible, best professional practice dictates considering the level of eligibility of the property, as well as by what means it derives its significance.

AHS IMPACT 5.4-2: BUILD-OUT OF THE ARROWHEAD SPRINGS SPECIFIC PLAN WOULD IMPACT ARCHAEOLOGICAL RESOURCES, PALEONTOLOGICAL RESOURCES, OR A UNIQUE GEOLOGIC FEATURE. [THRESHOLDS C2 AND C-3]

Impact Analysis:

Under CEQA guidelines, 15064.5 (a)(3)(A-D), a resource is considered historically significant if it meets at least one of four criteria related to its association with important events or individuals, its architectural characteristics and/or its data potential.

Eight of the resources recorded within the project area, CA-SBR-6869H, CA-SBR-6870H, CA-SBR-7021H, CA-SBR-7702H, CA-SBR-8248H, CA-SBR-10795H, P1071-27, and P36-020267 had been previously evaluated and were found to be not significant under the CEQA guidelines. A mano (a hand-held stone or roller for grinding corn or other grains) was discovered during the SWCA field survey. Because it was determined to be an isolated discovery and it was properly identified, no additional study will be required. Eleven of the resources, listed in Table 5.4-3 below, retain the potential to yield information important in prehistory or history (15064.5 (a)(3)(D).

Table 5.4-3
Potential "Historical Resource" Archaeological Sites

Site	Description
CA-SBR-2268/H including the four loci	Hotel Complex/prehistoric village • Gazebo • Bathing Area • Barbeque and Historic Trash • Historic Trash/Foundation Remains
CA-SBR-6870H	Concrete road bridge
CA-SBR-7019H	Holding tanks, gutter
CA-SBR-7020H	Retaining wall, steps, no foundation
CA-SBR-7022H	Retaining walls, trash
CA-SBR-7049H	Rim of the World highway
P1071-21	1890 Stone ditch tunnel
P36-017732	1850–1860 rock and concrete flume

Based upon descriptions of prior investigations, it appears that the integrity of some sites may have already been impacted by recent flooding, wild fires and development activities, such as the Metropolitan Water District's Inland Feeder Project. Development activities pursuant to the Arrowhead Springs Specific Plan, such as grading and establishment of infrastructure, would result in substantial adverse change, as defined by Section 15064.5(b) of the CEQA Guidelines.

Although previously unrecorded sites were identified during the fieldwork conducted by SWCA, the investigators noted the presence of other physical constraints such as natural or manmade obstacles that either hindered or prevented unobscured views of portions of the Arrowhead Springs study area resulting in areas that could not be adequately surveyed. The density of archaeological sites currently recorded in Arrowhead Springs suggests a strong likelihood that additional sites may exist in the unsurveyed sections. As a portion of Arrowhead Springs, however, would be dedicated for open space purposes, some of these potential sites may be located in future open space and would not be subject to site disturbance activities. Nevertheless, those portions of the Arrowhead Springs area that are proposed for development may contain additional prehistoric sites which have not been recorded or identified and which may be impacted by site disturbance activities. If any of these sites are determined to be unique archaeological sites or historical resources, the project would have a significant effect on those resources.

None of the prior surveys, investigations, and studies conducted in the project area have resulted in the discovery of paleontological resources. Although no fossil localities currently exist within the project boundaries, published and unpublished reports of scientifically significant fossil vertebrates from Pleistocene Older Alluvium do exist around Southern California. Numerous fossil localities in San Bernardino County and the Inland Empire have been recorded for Pleistocene Older Alluvium that yielded fossils of extinct Ice-Age mammals, including mammoths, mastodons, ground sloth, dire wolves, short-faced bears, saber-toothed cats, large and small horses, large and small camels, and bison. Fossil plant remains have also been recovered from these sediments.

Site grading and deeper excavations, especially disturbance activities associated with the new 115-room hotel annex and conference center may result in the discovery of paleontological resources. This would be a potentially significant effect. In order to ensure that the project will not have a significant effect as a result of the inadvertent disturbance of paleontological resources, a mitigation measure has been identified below. Should paleontologic resources be encountered, the mitigation measure requires an investigation to determine the nature and extent of paleontological resources and identify appropriate mitigation measures. Compliance with this measure will reduce this impact to less than significant.

AHS IMPACT 5.4-3: GRADING ACTIVITIES COULD POTENTIALLY DISTURB HUMAN REMAINS IN THE ARROWHEAD SPRINGS SPECIFIC PLAN AREA. [THRESHOLD C-4]

Impact Analysis: None of the prior surveys, investigations, and studies conducted in the project area has resulted in the discovery of prehistoric or historic human remains. However, the site does contain the remains of David Nobel Smith at a marked memorial and the area was also known to be used by Native American tribes, increasing the likelihood that undiscovered human remains may exist. Site grading and disturbance activities may result in the discovery of human remains, which would result is a significant impact. Mitigation measures have been incorporated regarding the monitoring of grading activities and the handling of human remains. Compliance with the mitigation measures will reduce the impact to human remains to less than significant.

5.4.4 Existing Regulations and Standard Conditions

- City of San Bernardino Municipal Code, Title 15 Buildings and Construction, Chapter 15.37 Historic Building Demolition Ordinance

- City of San Bernardino Municipal Code, Title 19 Land Use and Subdivision, Chapter 19 Main Street Overlay District

- By ordinance, the waiver of fees charged for permits issued for repairs, alterations or additions related to the preservation or rehabilitation of a qualified historical property

- State Bulletin 18, Traditional Tribal Cultural Places, signed into law in late 2004, places new requirements within CEQA for developments within or near Traditional Tribal Cultural Places. This Bill requires establishment of a Native American Traditional Tribal Cultural Site Register (TTCS Register), which would list all Native American sites deemed to be sacred to local tribes by the Native American Heritage Commission (NAHC). Under SB 18, a new process that would require the lead agency on a project covered by CEQA to ask the NAHC whether the proposed project is within a 5-mile radius of a TTCS. The NAHC would have 45 days to inform the lead agency if the proposed project is determined to be in proximity to a TTCS and another 75 days to determine whether the project would have an adverse impact on the TTCS. If the NAHC, the tribe, and interested parties agree upon the mitigation measures necessary for the proposed project, it would be included in the project's Environmental Impact Report (EIR). If there is no agreement, either the NAHC may determine lesser mitigations that would be acceptable for inclusion in the EIR or they may ask the Attorney General to take appropriate legal action against the project proponents.

  SB 18 also institutes a new process which would require a city or county to consult with the NAHC and any appropriate Native American tribe for the purpose of preserving relevant TTCSs prior to the adoption, revision, amendment, or update of a city's or county's general plan. In addition SB 18 gives a new definition of TTCS requiring a traditional association of the site with Native American traditional beliefs, cultural practices, or ceremonies or the site must be shown to actually have been used for activities related to traditional beliefs, cultural practices, or ceremonies. Previously, the site was defined to require only an association with traditional beliefs, practices, lifeways, and ceremonial activities.

- H.R 5237, the Native American Grave Protection and Repatriation Act, enacted July 10, 1990, states that any Native American human remains, funerary objects, sacred objects, and objects of inalienable communal property that are found on Federal or tribal lands after the date of enactment would be considered owned or controlled by (in this order) lineal descendants, the tribe on whose land it was found, the tribe having the closest cultural affiliation with the item, or the tribe which aboriginally occupied the area.

- The Cahuilla Inter-Tribal Repatriation Committee (CITRC) is a collaborative effort of Cahuilla tribes in southern California for the purpose of repatriation of objects meeting the criteria of the federal Native American Graves Protection and Repatriation Act of 1990. The CITRC provides information to museums and institutions about the Committee's operations and procedures and assists other tribes considering the formation of a repatriation project or collaborative committee.

5.4.5 Level of Significance Before Mitigation

5.4.5.1 San Bernardino General Plan

Without mitigation, the following impacts would be **potentially significant**:

GP Impact 5.4-1: Build-out of the San Bernardino General Plan could result in the loss of potentially historic structures. (Threshold C 1)

GP Impact 5.4-2: Build-out of the General Plan could impact sensitive archaeological resources or paleontological resources or a unique geologic feature. (Thresholds C-2 and C-3)

GP Impact 5.4-3: Grading activities could potentially disturb human remains.

5.4.5.2 Arrowhead Springs Specific Plan

Without mitigation, the following impacts would be **potentially significant**:

AHS Impact 5.4-1 Build-out of the Arrowhead Springs Specific Plan would impact an identified historic resource (Threshold C-1)

AHS Impact 5.4-2 Build-out of the Arrowhead Springs Specific Plan would impact archaeological, paleontological resources or a unique geologic feature. (Thresholds C-2 and C3)

AHS Impact 5.4-3 Grading activities could potentially disturb human remains in the Arrowhead Springs Specific Plan Area. (Threshold C-4)

5.4.6 Existing Regulations and Standard Conditions

5.4.7 Mitigation Measures

5.4.7.1 San Bernardino General Plan

GP 5.4-1 In areas of documented or inferred historic resource presence, City staff shall require applicants for development permits to provide studies to document the presence/absence of historical resources. On properties where historic structures or resources are identified, such studies shall provide a detailed mitigation plan, including a monitoring program and recovery and/or in situ preservation plan, based on the recommendations of a qualified historical preservation expert.

GP 5.4-2 In areas of documented or inferred archeological and/or paleontological resource presence, City staff shall require applicants for development permits to provide studies to document the presence/absence of such resources. On properties where resources are identified, such studies shall provide a detailed mitigation plan, including a monitoring program and recovery and/or in situ preservation plan, based on the recommendations of a qualified cultural preservation expert.

GP 5.4-3 In the event of the accidental discovery or recognition of any human remains in any location other than a dedicated cemetery, the following steps shall be taken:

There shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until the San Bernardino County Coroner is contacted to determine if the remains are prehistoric and that no investigation of the cause of death is required. If the coroner determines the

remains to be Native American, then the coroner shall contact the Native American Heritage Commission with in 24 hours, and the Native American Heritage Commission shall identify the person or persons it believes to be the most likely descendent from the deceased Native American. The most likely descendant may make recommendations to the landowner or the person responsible for the excavation work, for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in Public Resources Code Section 5097.98; or

Where the following conditions occur, the landowner or his authorized representative shall rebury the Native American human remains and associated grave goods with appropriate dignity either in accordance with the recommendation of the most likely descendant or on the property in a location not subject to further subsurface disturbances:

- The Native American Heritage Commission is unable to identify a most likely descendant or the likely descendant failed to make a recommendation within 24 hours after being notified by the commission; or
- The descendant identified fails to make a recommendation; or
- The landowner or his authorized representative rejects the recommendation of the descendant, and the mediation by the Native American Heritage Commission fails to provide measures acceptable to the landowner.

5.4.7.2 Arrowhead Springs Specific Plan

AHS 5.4-1A

Prior to issuance of any building, grading or demolition permit for the modification or destruction of any historic structure, the project applicant shall submit to the Director of Development Services written recommendations prepared by a qualified architectural historian of the measures that shall be implemented to protect each **historic site** eligible for listing on the NRHP and CRHP. The list includes but is not limited to the following as shown in Table 5.4-1 and illustrated in Figure 5.4-3.

Hotel/Steam Caves	Bungalow 10
Pool, Cabanas, Tennis Courts	Mud Baths
Bungalow 1	Smith Memorial
Bungalow 3	Indian Statue
Bungalow 4	Reservoir
Bungalow 5	Springs
Bungalow 6	Fountains
Bungalow 7	Terrace and Tennis Courts
Bungalow 8	Landscape Elements
Bungalow 9	Miscellaneous Features

Modification. Appropriate mitigation measures for “historical resources” could include preservation of the site through avoidance or capping, incorporation of the site in greenspace, parks, or open space, data recovery excavations of the finds, or a rehabilitation plan in compliance with the Secretary of Interior’s Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings (1995) prepared by a qualified historic preservation professional that would be based to the greatest extent

feasible on historical data. A particular focus of the rehabilitation plan should be the hotel building, including landscaping, interiors, exteriors and furnishings.

Demolition. To the extent eligible sites are not preserved in place, prior to the issuance of a demolition permit for the demolition of any Historic Structure eligible for listing on the NRHP and CRHP, including Bungalows 3,7,8,9,10 and 11, the historian shall conduct a data recovery program which includes:

Comprehensive Survey. A comprehensive inventory of historic features on the property, including but not limited to buildings, structures, objects, water features, wall, and landscape materials shall be conducted. To the greatest extent feasible, the preservation and rehabilitation of historic features on the property shall be incorporated into the development plan.

Interpretative Plan. The applicant shall be required to produce an historical interpretation plan for the property. This plan shall include a permanent, on-site display within a public area which will provide historic information about the founding and history of Arrowhead Springs. Historic and/or contemporary photographs and other artifacts and materials should be included within the display. Other indoor or outdoor interpretive displays shall be produced, as appropriate. The precise content, format, and location and design shall be determined by a qualified historic preservation professional, and subject to the approval by the City of San Bernardino.

Documentation. A Historic American Buildings Survey (HABS) outline format narrative description of the property, contemporary and historic photographs, and other relevant documentation shall be prepared by a historic consultant approved by the City. Prior to the issuance of a demolition permit for the subject property, the report shall be submitted for approval to the Director of Community Development and the Director of Community Services, and an approved original shall be deposited in the City of San Bernardino Branches of the San Bernardino County Public Library (or other suitable repository as determined by the Directors of Community Development and Community Services).

AHS 5.4-1B

The EIR concludes that there are or may be significant historical structures/ resources not currently ascertainable within areas where ground disturbing activity is proposed by the project. Therefore, prior to issuance of the first preliminary or precise grading permit for development in the Arrowhead Springs Specific Plan area, the landowner or subsequent project applicant shall provide evidence that an qualified historic preservation professional has been retained by the landowner or subsequent project applicant, and has conducted a site survey of the development area at such time as all ground surfaces are visible after current uses are removed. If any sites are discovered, the historian shall conduct surveys and/or test level investigations. Testing and evaluation may consist of surface collection and mapping, limited subsurface excavations, and the appropriate analyses and research necessary to characterize the artifacts and deposit from which they originated. Upon completion of the test level investigations, for sites are determined to be unique a “historical resource” as set forth in CEQA Guidelines Section 15064.5, the following measures shall be undertaken: the historian shall submit its recommendations to the landowner or subsequent project applicant and the Director of Community Development on the measures that shall be implemented to protect the site. Appropriate measures could include preservation in place through

planning construction to avoid the historical resource, incorporation into greenspace, parks, or open space, data recovery excavations of the finds or compliance with the Secretary of Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic buildings (1995).

- Preparation of a research design for those sites determined to the "historical resources" that cannot be avoided that describes the recommended field investigations, and makes provisions for adequately recovering the scientifically consequential information from and about the "historical resource."
- Conducting site excavations in accordance with the research design with an emphasis on obtaining an adequate sample for analysis within the limits of the research questions being addressed. Special studies such as pollen analyses, soil analyses, radiocarbon dating, and obsidian hydration dating should be conducted as appropriate.
- Monitoring of all field excavations by a Native American representative.
- Preparation of a final report of the Phase 3 data recovery work and submittal of the research design and final report to the South Central Coastal Information Center (SCCIC), and other agencies, as appropriate.
- Any archaeological artifacts recovered as a result of mitigation shall be donated to a qualified scientific institution approved by the Director of Community Development where they would be afforded long-term preservation to allow future scientific study.

AHS 5.4-2A

Prior to issuance of the first preliminary or precise grading permit, and for any subsequent permit involving excavation to increased depth, the landowner or subsequent project applicant shall provide evidence that an archaeologist and/or paleontologist have been retained by the landowner or subsequent project applicant, and that the consultant(s) will be present during all grading and other significant ground disturbing activities. These consultants shall be selected from the roll of qualified archaeologist and paleontologists maintained by the County of San Bernardino. Should any archeological/paleontological resources be discovered, the monitor is authorized to stop all grading in the immediate area of the discovery, and shall make recommendations to the Director of Development Services on the measures that shall be implemented to protect the discovered resources, including but not limited to excavation of the finds and evaluation of the finds in accordance with Section 15064.5 of the CEQA Guidelines. If the resources are determined to be "historic resources" at that term is defined under Section 15064.5 of the CEQA Guidelines, mitigation measures shall be identified by the monitor and recommended to the Director of Development Services. Appropriate mitigation measures for significant resources could include avoidance or capping, incorporation of the site in greenspace, parks or open space, or data recovery excavations of the finds. No further grading shall occur in the area of the discovery until the Director approves the measures to protect these resources. Any paleontological or archaeological artifacts recovered as a result of mitigation shall be donated to a qualified scientific institution approved by the Director of Community Development where they would be afforded long-term preservation to allow future scientific study.

AHS 5.4-2B

Prior to the issuance of any grading permit, the following note shall be placed on the cover sheet, and discussed at the pre-grade meeting:

a) The paleontologist retained for the project shall immediately evaluate the fossils which have been discovered to determine if the are significant and, if so, to develop a plan to collect and study them for the purpose of mitigation.

b) The paleontologic monitor must be empowered to temporarily halt of redirect excavation equipment of fossils are found to allow evaluation and removal of them if necessary, the monitor should be equipped to speedily collect specimens if the are encountered.

c) The monitor, with assistance if necessary, shall collect individual fossils and/or samples of fossil bearing sediments. If specimens of small animal species are encountered, the most time and cost efficient method of recovery is to remove a selected volume of fossil bearing earth from the grading area and screen wish it off-site.

d) Fossils recovered during the earthmoving or as a result of screen-washing of sediment samples shall be cleaned and prepared sufficiently to allow identification. This allows the fossils to be described in a report of findings and reduces the volume of matrix around specimens prior to storage, thus reducing storage costs.

e) A report of findings shall be prepared and submitted to the public agency responsible for overseeing developments and mitigation of environmental impacts upon completion of mitigation. This report would minimally include a statement of the type of paleontological resources found, the methods and procedures used to recover them, an inventory of the specimens recovered, and a statement of their scientific significance.

AHS 5.4-2C

The EIR concludes that there are or may be significant archaeological resources within areas where ground disturbing activity is proposed by the project. Therefore, prior to the first preliminary or precise grading permit for development in the Arrowhead Springs Specific Plan area, each **prehistoric** and **historic archeological site** (listed below and described in Table 5.4-3) located within the project grading footprint must be tested and evaluated, following clearing and scraping activities.

- CA-SBR-2268/H, including the four loci
- CA-SBR-6870H
- CA-SBR-7019H
- CA-SBR-7020H
- CA-SBR-7022H
- CA-SBR-7049H
- P1071-21
- P36-017732

Testing and evaluation may consist of surface collection and mapping, limited subsurface excavations, and the appropriate analyses and research necessary to characterize the artifacts and deposit from which they originated. Upon completion

of the test level investigations, for sites are determined to be unique archaeological sites or historical resources as set forth in CEQA Guidelines Section 15064.5, the following measures shall be undertaken: the archaeologist shall submit its recommendations to, the landowner or subsequent project applicant and the Director of Community Development on the measures that shall be implemented to protect the sites. Appropriate measures for unique archaeological resources or historical resources could include preservation in place through planning construction to avoid archaeological sites; incorporation of sites within parks, greenspace, or other open space; covering the archaeological sites with a layer of chemically stable soil before building tennis courts, parking lots, or similar facilities on the site or deeding the site into a permanent conservation easement. When data recovery through excavation is the only feasible mitigation, a data recovery plan, which makes provision for adequately recovering the scientifically consequential information from and about the historical resource, shall be prepared and adopted prior to any excavation being undertaken. Such studies shall be deposited with the California Historical Resources Regional Information Center. Archaeological sites known to contain human remains shall be treated in accordance with the provisions of Section 7050.5 Health and Safety Code.

- Preparation of a research design for those sites determined to the "historical resources" that cannot be avoided that describes the recommended field investigations, and makes provisions for adequately recovering the scientifically consequential information from and about the "historical resource."
- Conducting site excavations in accordance with the research design with an emphasis on obtaining an adequate sample for analysis within the limits of the research questions being addressed. Special studies such as pollen analyses, soil analyses, radiocarbon dating, and obsidian hydration dating should be conducted as appropriate.
- Monitoring of all field excavations by a Native American representative.
- Preparation of a final report of the Phase 3 data recovery work and submittal of the research design and final report to the South Central Coastal Information Center (SCCIC), and other agencies, as appropriate.
- Any archaeological artifacts recovered as a result of mitigation shall be donated to a qualified scientific institution approved by the Director of Community Development where they would be afforded long-term preservation to allow future scientific study.

AHS 5.4-3A

In the event of the accidental discovery or recognition of any human remains in any location other than a dedicated cemetery, the following steps shall be taken:

There shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until the San Bernardino County Coroner is contacted to determine if the remains are prehistoric and that no investigation of the cause of death is required. If the coroner determines the remains to be Native American, then the coroner shall contact the Native American Heritage Commission within 24 hours, and the Native American Heritage Commission shall identify the person or persons it believes to be the most likely

descendent from the deceased Native American. The most likely descendant may make recommendations to the landowner or the person responsible for the excavation work, for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in Public Resources Code Section 5097.98; or

Where the following conditions occur, the landowner or his authorized representative shall rebury the Native American human remains and associated grave goods with appropriate dignity either in accordance with the recommendation of the most likely descendant or on the property in a location not subject to further subsurface disturbances:

- The Native American Heritage Commission is unable to identify a most likely descendant or the likely descendant failed to make a recommendation within 24 hours after being notified by the commission; or
- The descendant identified fails to make a recommendation; or
- The landowner or his authorized representative rejects the recommendation of the descendant, and the mediation by the Native American Heritage Commission fails to provide measures acceptable to the landowner.

AHS 5.4-3B

Upon receipt of an application for a project subject to CEQA and within the City's jurisdiction, the City of San Bernardino's representative shall consult with the relevant Tribe(s)' tribal representative(s), as determined by the Native American Heritage Commission, to determine if the proposed project is within a culturally sensitive area to the tribe. If sufficient evidence is provided to reasonably ascertain that the site is within a [tribal] culturally sensitive area, then a cultural resources assessment prepared by a City-certified archaeologist shall be required. The findings of the cultural resources assessment shall be incorporated into the CEQA documentation. A copy of the report shall be forwarded to the Tribe(s). If mitigation is recommended in the CEQA document, the procedure described in MM 5.4-3C shall be followed.

AHS 5.4-3C

Prior to the issuance of grading permits for which the CEQA document defines cultural resource mitigation for potential tribal cultural resources, the project applicant shall contact the designated Tribe(s)' tribal representative to notify them of the grading, excavation, and monitoring program. The applicant shall coordinate with the City of San Bernardino and the tribal representative(s) to negotiate an Agreement that addresses the designation, responsibilities, and participation of tribal monitors during grading, excavation, and ground-disturbing activities; scheduling; terms of compensation; and treatment and final disposition of any cultural resources, sacred sites, and human remains discovered on the site. The City of San Bernardino shall be the final arbiter of the conditions included in the Agreement.

5.4.8 Level of Significance After Mitigation

5.4.8.1 San Bernardino General Plan

The mitigation measures identified above would reduce potential impacts associated with cultural resources to a level that is less than significant. Therefore no significant unavoidable adverse impacts relating to cultural resources have been identified,

5.4.8.2 Arrowhead Springs Specific Plan

Although the mitigation measures listed above would reduce cultural resource impacts for AHS Impact 5.4-2 and AHS Impact 5.4-3 to a level that is less than significant, the following impact would remain significant and unavoidable:

AHS Impact 5.4-1: In accordance with CEQA Guidelines demolition of a significant historic resource is determined to be an unavoidable adverse impact.

5.5 GEOLOGY AND SOILS

The analysis in this section is based in part on the following technical report(s):

- *City of San Bernardino General Plan Update Technical Background Report, Chapter 5, Hazards*, Envicom Corporation, February 1988.
- *Feasibility Study, Report of Preliminary Geotechnical Evaluation Proposed Mixed-Use Development, Arrowhead Springs*, Soils Southwest, Inc., February 14, 2005 (see Volume III, Appendix D).

5.5.1 Environmental Setting

5.5.1.1 San Bernardino General Plan Update

Geologic Setting

General Discussion

The City of San Bernardino lies within the Bunker Hill-San Timoteo Basin, which is bound by the active San Andreas Fault zone on the northeast and the active San Jacinto Fault zone on the southwest. The San Andreas Fault zone impedes movement of groundwater, producing springs and a groundwater level change that marks the fault trace along the northern boundary of the subbasin. The San Jacinto fault forms a strong barrier to groundwater that raises the water table nearly to the surface below the course of the Santa Ana River[1]. The Bunker Hill – San Timoteo Basin includes the cities of Rialto, Colton, Loma Linda, Redlands, and San Bernardino.

The City of San Bernardino lies on a broad, gently sloping lowland that flanks the southwest margin of the San Bernardino Mountains. The lowland is underlain by alluvial sediments eroded from bedrock in the adjacent mountains and washed by rivers and creeks into the valley region where they have accumulated in layers of gravel, sand, silt, and clay. Sediment accumulation has continued for a few million years, during which time increasing thicknesses of sediments have gradually buried the original hill and valley topography of the Bunker Hill-San Timoteo Basin. Shandin Hills and other smaller hills areas in the basin are remnants of the original topography.

The San Bernardino Mountains, Shandin Hills, and other hilly areas are comprised predominantly of Mesozoic and older crystalline basement terrain. Younger sedimentary deposits consist of late Pleistocene alluvium outcroppings on the older alluvial fans northeast of the City, and underlying the younger Holocene alluvium of the San Bernardino Valley. These younger sediments accumulated in two different depositional environments. Alluvial fans that extend downslope from the mouths of the San Bernardino Mountain canyons consist of coarser-grained and more poorly-sorted boulders, cobbles, gravels, sands, silts and clays that decrease in size and abundance to the southwest. Floodplain deposits from the Santa Ana River and Cajon and Lytle Creeks in the vicinity of metropolitan San Bernardino are comprised predominantly of sand, sandy silt, and silt. The alluvial fan and floodplain deposits are interlain and form a highly variable and often times laterally discontinuous layering of various sizes of alluvial materials.

[1] Department of Water Resources. *Upper Santa Ana Valley Groundwater Basin, Bunker Hill Subbasin.* California Groundwater Bulletin 118. Updated February 7, 2004.

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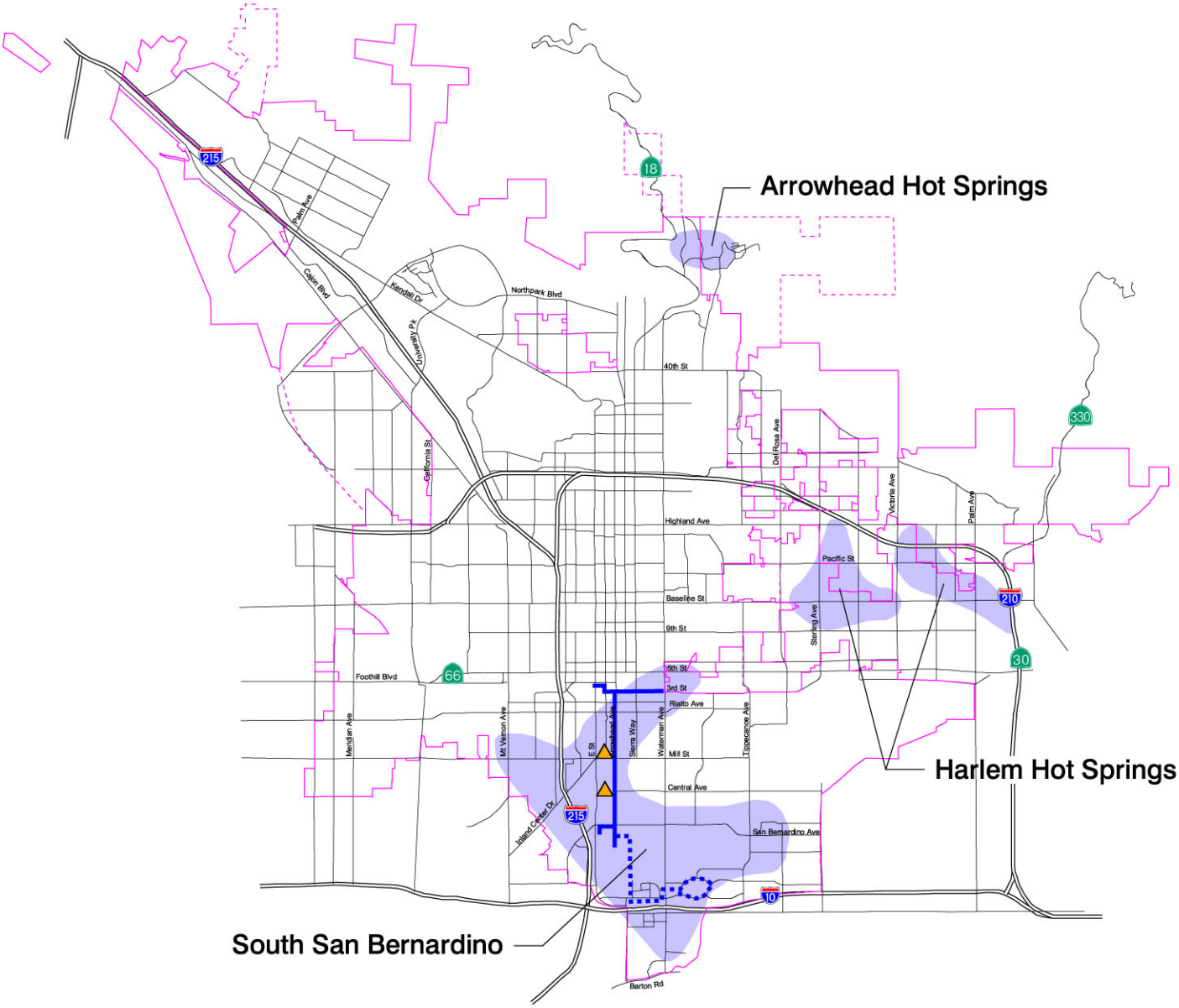
Geothermal Resources



Geothermal Resource Area

Source: "Resource Investigation of Low and Moderate Temperature Geothermal Areas in San Bernardino, California," August 1981, California Division of Mines and Geology Open File Report 82-11 SAC.

City of San Bernardino Municipal Water Department Geothermal Well

Distribution Line

Proposed Distribution Line

City Boundary

Sphere of Influence Boundary

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Source: Envicom Corporation

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Geothermal Activity

Geothermal activity is known to occur in the southern portion of the City of San Bernardino and the Arrowhead Springs area and is shown in Figure 5.5-1, *Geothermal Resources*. Geothermal springs in the City of San Bernardino come from a depth of 15,000 feet due to fractures of the San Andreas Fault Zone.

These deep subterranean faults and cracks allow rainwater and snowmelt to seep underground where the water is heated by the inner earth and circulates back up to the surface, to appear as hot springs or thermal vents. Geothermal activity is a unique geologic resource inextricably connected to the hydrology and tectonic activity within the basin. Geothermal resources beneath the City are connected to the Bunker Hill-San Timoteo Basin (aquifer). While hot water created from geothermal activity from the San Andreas Fault Zone is contained in separate perched aquifers above the fresh water aquifer, these two hydrologic resources can affect one another[2].

According to the San Bernardino Municipal Water Department, there are approximately 90-100 geothermal wells and springs currently in operation, which are concentrated in the Commerce Center, Central City, Tri-City areas, and former Norton Air Force Base. Currently, the San Bernardino Municipal Water Department maintains two wells in the southern portion of the city for geothermal energy sources. For a geothermal resource, the most important features are the maximum temperature, aerial extent, depth, volume, and water quality for it to be used as a potential energy resource. The geothermal springs in the City of San Bernardino are among the hottest in the United States, with hottest historic temperatures in the City ranging from 70°C (158°F) in the southern portions of the City to 140°C (284°F) in the Arrowhead Springs area in the San Bernardino Mountains. One of the hottest wells in the planning area was located in the southwestern portion of the City in the old "Urbita Springs"; however, the majority of the wells in the San Bernardino planning area exhibit well temperatures between 120°F and 140°F. [3]

The following describes the known areas containing historic springs within the City of San Bernardino (the Arrowhead Hot Springs are described in Section 5.5.1.2, Arrowhead Springs Specific Plan, below):

South San Bernardino

The Urbita Springs were originally developed as a mineral bath and amusement park in the late 1860, and water was piped at 1,000 feet. In 1966, the first contracts for the Inland Shopping Center were let in and the Urbita Hot Springs were destroyed. The site is currently under parking lots and department stores of the Inland Center Mall. Prior to construction, the site was excavated and removed to a depth of 12 feet and backfilled. Today, there is a large subterranean drain that passes under part of the shopping center and surfaces just east of the Interstate 215 freeway. A trickle of water in this drain is the last vestige of the Urbita Hot Springs.

The De Sienna Hot Springs were located 0.6 mile southwest of the Urbita Hot Springs on the southeast flank of a small knoll, sometimes referred to as Bunker Hill. Historical data indicate that a 547-foot-deep well was drilled in 1926 and had a temperature of 37°C (99°F).

Harlem and Rabel Hot Springs

The Harlem Hot Springs are located just north of the intersection of Baseline Road and Victoria Avenue. Natural hot springs originally flowed into Warm Creek. Historical data indicate that in 1989 the first well was drilled to 300 feet and produced water of 46°C (115°F). These hot springs were then developed as a recrea-

[2] California Department of Mines and Geology. Resource Investigation of Low- and Moderate- Temperature Geothermal Areas in San Bernardino California. DMG Open File Report 82-11. 1981.

[3] City of San Bernardino Municipal Water Department. Geothermal Energy, Heat from the Earth Power for the Future. Obtained in February 2005 from http://www.sbcitywater.org/

tion park and picnic area and provided mineral water and mud baths. Use of this hot spring eventually deteriorated and now lowering geothermal water table and water temperatures at the Harlem Hot Springs threaten loss of this resource.

The Rabel Hot Springs were located approximately 0.25 mile west of the Harlem Hot Springs. Development of the Rabel Hot Springs probably very closely paralleled that of Harlem Hot Springs. Rabel Hot Springs was operated as a spa in the late 1800s and offered mineral mud baths, but was closed as a spa in 1912. Soon afterwards this site was operated as a hog ranch until the Baseline Laundry was opened in 1916. The operating well on the property is used heavily by the laundry and temperature at the well was measured as 28°C (82.4°F) on April 22, 1981. Historical newspapers from 1966 detail that water levels at the Harlem Hot Springs and the Rabel Hot Springs have dropped 160 to 170 feet and water once hot, is now lukewarm. Both Rabel Hot Springs and Harlem Hot Springs were originally naturally flowing springs which comprised the principle source of the flow in Warm Creek. The apparent historical decrease in this geothermal area may suggest that the available geothermal resource there has a finite volume.

Geologic Hazards

Slope Failure (Landslides)

General slope stability is determined by a number of factors including slope, vegetative cover, wildfire, bedrock, soil, precipitation, and human alteration. Slopes may be in temporary equilibrium until one of the above factors is modified by natural or human activity resulting in an unstable condition and potential failure. Figure 5.5-2, *Soil-Slip Susceptibility*, depicts areas in the City of San Bernardino which are potentially susceptible to slope failure. According to the Preliminary Soil-Slip Susceptibility Map for the southern half of San Bernardino, portions of the City of San Bernardino are located within areas designated as either having low, moderate, or high soil-slip susceptibility.[4] Potential slope failures in the following potentially hazardous zones could affect buildings, reservoirs, roads and utilities.

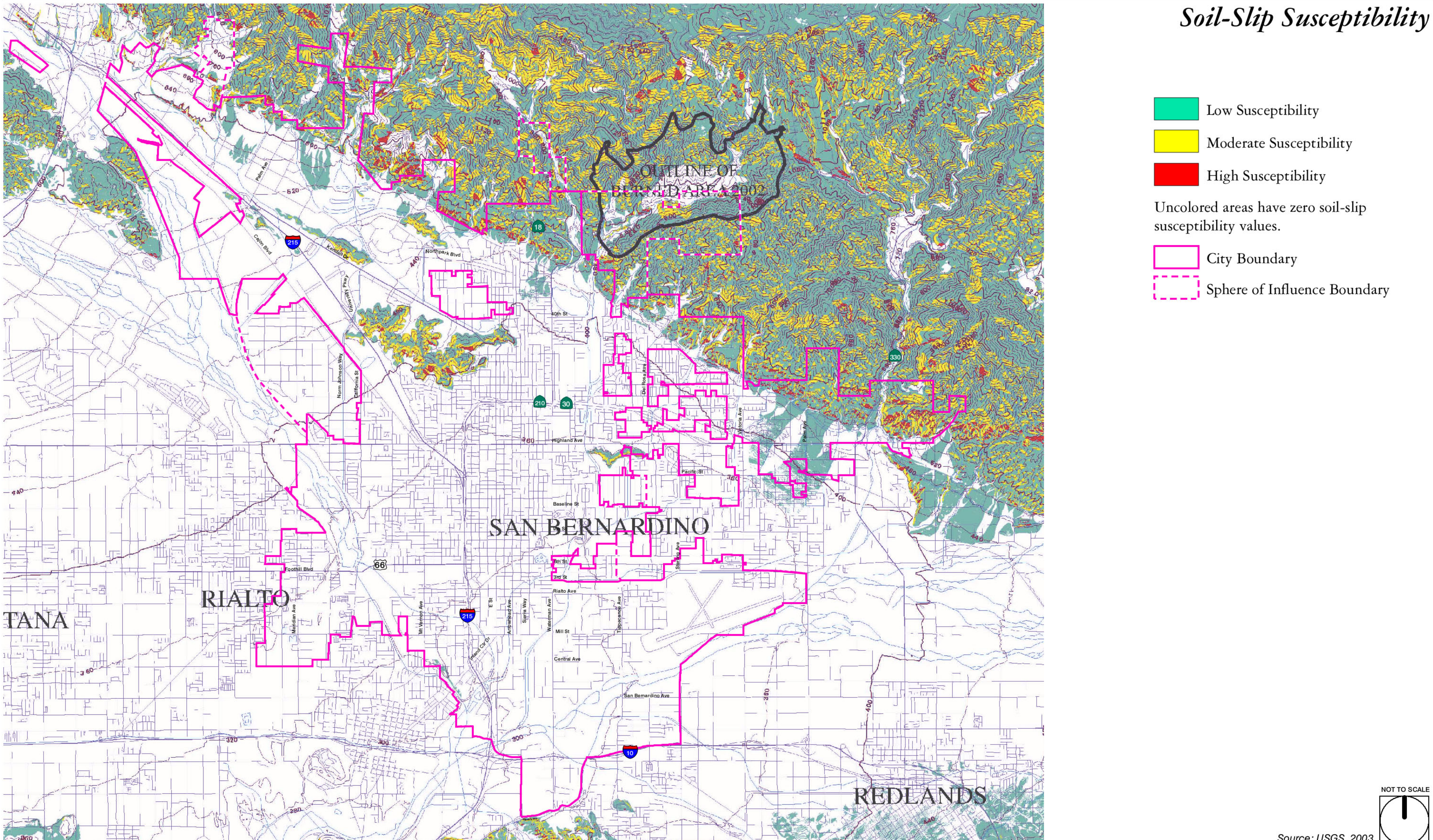
- Areas of low relief with low to moderate susceptibility which may contain small scale surficial soil slips, debris flow and mudflows on steep localized slopes.
- Areas of moderate and high relief with low to moderate susceptibility which may contain small to large rotational slides, debris slides and combinations of surficial slides and flows. These areas contain individual landslides that have been included on the regional slope stability and landslides map

Compressible Soils

Poorly consolidated or highly compressible soils are expected to have low bearing capacities and therefore liable to differential settlement. With highly compressible soils, water drains faster than cohesive soils and the load is transferred immediately, this process is called compression, or settlement. The amount of settlement is dependent on the applied load, the moisture content and structure of the soil. Compression of the soils brought about by an increase in stress from construction, foundation or other results in a deformation and relocation of soil particles, and expulsion of water or air from void spaces. Examples of highly compressible materials are areas of fill such as dumping grounds and peat deposits at surface or at depth. In addition, younger soils, which include textured silty and sandy soils, contain less well compacted sediments and are therefore more susceptible to settlement (e.g., younger Holocene deposits include alluvial materials 500 to 1,000 years old).

[4] Morton, D.M, Alvarez, R.M & Campbell, R.H. *Soil-Slip Susceptibility Map for the South Half of the San Bernardino 30' x 60' Quadrangle, Southern California.* Preliminary Soil-Slip Susceptibility Maps, Southwestern California. 2003

Soil-Slip Susceptibility



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Ground Subsidence

In California, subsidence related to man's activities has been attributed to withdrawal of subsurface fluids such as oil and groundwater, oxidation of organic materials such as peat and coal, and by hydroconsolidation (from excessive irrigation) of loose, dry soils in a semi-arid climate. Subsidence can affect structures sensitive to slight changes in elevation or slope such as highways, canals, pipelines, sewers and railroads. Subsidence commonly occurs in such slight magnitude and over large areas that it is not perceptible to an observer without detailed regional surveying studies. Smaller buildings within a uniform subsidence area may not sustain damage unless differential subsidence should occur. Differential subsidence may adversely affect the integrity of structures built within these areas.

Historically, up to one foot of subsidence may have occurred within the City of San Bernardino. The historic area of subsidence was within the thick poorly consolidated alluvial and marsh deposits of the old artesian area north of Loma Linda. Potential subsidence in this area could potentially be as great as five to eight feet if ground water is depleted from the Bunker Hill – San Timoteo Basin. In the San Bernardino area, the potential for subsidence has been significantly reduced since 1972, when the San Bernardino Municipal Water District began to maintain groundwater levels from recharge to percolation basins, which in turn filter back into the alluvial deposits.

Figure 5.5-3, *Potential Subsidence Areas*, depicts areas in the City of San Bernardino which may be susceptible to subsidence.

Erosion

Soil erosion is a naturally occurring process on all land. The agents of soil erosion are water and wind. Soil erosion may be a slow process that continues relatively unnoticed, or it may occur at an alarming rate causing serious loss of topsoil. The rate and magnitude of soil erosion by water is controlled by the following factors: rainfall intensity and runoff; soil erodibility; slope gradient and length; and vegetation cover.

Soil erodibility is an estimate of the ability of soils to resist erosion, based on the physical characteristics of each soil. Some soil types are more susceptible to wind and rain erosion than others. Twenty-two soil series were identified in the City of San Bernardino and are listed in Table 5.5-1.

The Delhi fine sand and Tujunga loamy sand are both susceptible to wind erosion if left exposed without adequate vegetative cover. Delhi fine sand and Tujunga loamy sand are found on old alluvial fan or floodplain areas on slopes from 0 to 15 percent. The fine sandy texture is especially prone to erosion during periods of high winds that frequent the region.

The Cienaba sandy loam, Friant rock outcrop, Greenfield sandy loam, and Saugus sandy loam are all susceptible to water erosion. The Cienaba sandy loam, Friant rock outcrop, Greenfield sandy loam, and Saugus sandy loam are found on variable slopes from 2 to 50 percent depending on particular soil type. These soils commonly occur on alluvial fans, hills, and at the base of the San Bernardino Mountain front. Rapid precipitation runoff, sandy soil texture and denudation of vegetative cover can lead to potential water erosion of these soils. Hillside grading without proper erosion control plans, and off-road vehicle use in areas of erosion-prone soils can increase the hazard.

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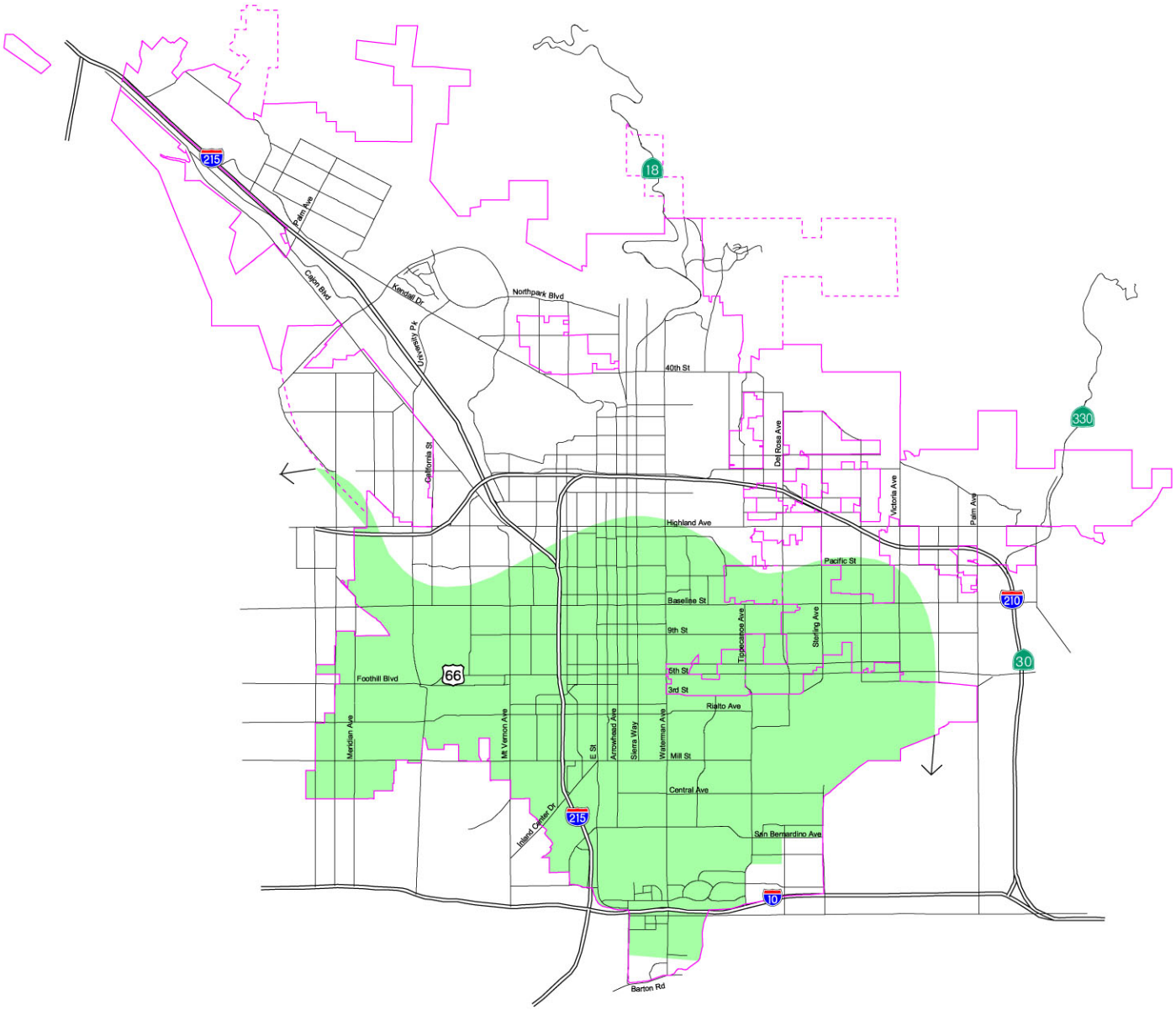
Potential Subsidence Areas



Note: Degree of subsidence dependent on groundwater levels. Historic subsidence may have occurred in above area.
(After Fife and others, 1976)

Areas of Potential Ground Subsidence

City Boundary

Sphere of Influence Boundary

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Table 5.5-1
Soil Characteristics within the City of San Bernardino

Soil (Symbol)	Texture	Potential Limitations
Cieneba (CnD)	Sandy Loam	High erosion
Cieneba (Cr)	Rock Outcrop	Slope
Delhi (Db)	Fine Sand	High blowing soil
Friant (Fr)	Rock Outcrop	High erosion
Grangerville (Gr)	Fine Sandy Loam	None
Grangerville (Gs)	Fine Sandy Loam	None
Greenfield (GtC)	Sandy Loam	None
Greenfield (GrD)	Sandy Loam	High erosion
Hanford (HaC)	Coarse Sandy Loam	None
Hanford (HaD)	Coarse Sandy Loam	High erosion
Hanford (HbA)	Sandy Loam	None
Psamments/Fluvents (Ps)	—	Flooding
Ramona (RmC)	Sandy Loam	None
Ramona (RmD)	Sandy Loam	High erosion
Ramona (RmE2)	Sandy Loam	High erosion
Saugus (ShF)	Sandy Loam	High erosion
Soboba (SoC)	Gravelly Loamy Sand	None
Soboba (SpC)	Stony Loamy Sand	None
Tujunga (TuB)	Gravelly Loamy Sand	None
Tujunga (TvC)	Gravelly Loamy Sand	High blowing soil
Vista (Vr)	Rock Outcrop	Slope
Wasteland (w)	Variable	Slope

Source: City of San Bernardino General Plan Update Technical Background Report, Chapter 5, Hazards, Envicom Corporation, February 1988.

Seismic Hazards

Earthquake Faults Including Information on Historic Earthquakes

The UBC Seismic Zone Map divides the United States into zones of potential earthquake damage. The four UBC Seismic Zones are Zone 0 (no damage), Zone 1 (minor damage), Zone 2 (moderate damage), and Zone 3 (major damage), and Zone 4 (major damage caused by near-by fault movements) was added. The City of San Bernardino is located is Seismic Zone 4. The following is a discussion of significant faults potentially affecting the City of San Bernardino. Table 5.5-2 lists the maximum credible earthquake magnitude of each fault. A description of the principle active faults that affect the City of San Bernardino is listed below.

Table 5.5-2
Principal Active Faults

Fault	Maximum Credible Earthquake Magnitude (magnitude/peak g's)
San Andreas	8.5
San Jacinto (includes Glen Helen and Loma Linda)	7.5
Cucamonga-Sierra Madre	6.5+
Whittier-Elsinore	7.5–7.0
San Fernando	7.0
Hollywood-Raymond Hills	7.0
Newport-Inglewood	7.0
Santa Monica	7.0
Rialto-Colton	6.5
Helendale	7.0
Cleghorn	6.7
North Frontal	7.0
Crafton	6.4
Banning	6.9
Red Hill	6.5

Source: City of San Bernardino General Plan Update Technical Background Report, Chapter 5, Hazards, Envicom Corporation, February 1988.

The San Andreas Fault system, including the north and south branches, forms the dominant fault feature in the City of San Bernardino area. Three of California's largest historic earthquakes have occurred along this fault in 1857 near Fort Tejon, 1906 near San Francisco, and 1989 near Santa Cruz.[5] The fault segment that affects the City of San Bernardino begins at the Salton Sea, runs along the southern base of the San Bernardino Mountains, crosses through the Cajon Pass and continues to run northwest along the northern base of the San Gabriel Mountains. The fault segment southeast of Cajon Pass and within the San Bernardino planning area has not experienced a major earthquake for at least 265 years and possibly for as long as 600 years. Future predictions of magnitude and displacement currently cannot precisely be determined along the San Andreas Fault; however, regional studies indicate that a magnitude 8.0 or larger earthquake could be expected to occur in the future and should be considered for planning and design purposes.

The San Jacinto fault system includes the Glen Helen, San Jacinto, and Loma Linda Faults in the City of San Bernardino. These faults display Late Quaternary to Holocene activity with small earthquakes evident near their fault traces. In terms of number of damaging earthquakes, the San Jacinto Fault zone has been the most prolific in historical time. At least 10 events have taken place from 1895 to 1980 over a fault length of 120 miles, with about half of these events causing damage in the San Bernardino-Riverside area. Regional studies suggest that a magnitude 7.0 to 7.5 earthquake is possible on the San Jacinto Fault system that would affect the City of San Bernardino.

The Cucamonga–Sierra Madre fault system is part of a reverse and thrust fault zone that bounds the southern margin of the eastern San Gabriel Mountains, approximately 10 miles northwest of the central City area. The Cucamonga Fault is not known to have generated a significant earthquake in historic time, but a series of fault scarps in the Holocene alluvial fan deposits at the southeastern base of the San Gabriel

[5] Information from the Envicom's 1988 Technical appendix was supplemented with information obtained from http://en.wikipedia.org/wiki/San_Andreas_Fault on February 4, 2005 for documentation of the 1989 Loma Prieta earthquake

Mountains attests to a succession of ground-rupturing earthquakes in the past. Earthquake scenarios that could affect the San Bernardino planning area range from magnitude 6.5 to 6.75.

The Whittier–Elsinore fault system is located approximately 25 miles west of the city of San Bernardino. The Elsinore Fault system extends nearly 120 miles from the Mexican border areas, northwest, beyond the Santa Ana Mountains. The Whittier Fault extends further northwest from the Elsinore fault zone. A magnitude 6.5 design earthquake is considered to be reasonable for these faults.

The San Fernando Fault is located approximately 64 miles west of the City of San Bernardino. The San Fernando Fault is a reverse fault near the back of the San Gabriel Mountains that is approximately 9 miles long and was the source of the 1971 Magnitude 6.6 San Fernando earthquake.

The eastern terminus of the Hollywood-Raymond Hills fault system is located approximately 42 miles west of the City of San Bernardino. The Hollywood-Raymond Hills fault system extends in an east-west direction along the south side of the Santa Monica Mountains and may be continuous with the Raymond Fault in the vicinity of Glendale. The Raymond Fault exhibits fault scarps, sag ponds, and deformation and offset of Holocene strata.

The Newport-Inglewood Fault is a northwest trending fault displaying a complex zone of deformation from Beverly Hills to south of Laguna Beach. The Newport-Inglewood Fault has been the source of damaging earthquakes of up to magnitude 6.3 in 1933 at Long Beach. The fault is approximately 57 miles west of the City.

The Santa Monica Fault is part of a major east-west trending system of reverse faults that extend from northeast of Santa Monica into the Santa Barbara Channel. Late Quaternary offset is evident and probable earthquake magnitudes of 6.5 could be expected along this fault, located approximately 70 miles west of the City of San Bernardino.

The Rialto-Colton Fault consists of two echelon strands with a total length of about 16 miles that trend in a northwest direction. No Surface offset is evident for this fault but small earthquakes have occurred near its subsurface trace. This fault is located approximately 4 miles from the City of San Bernardino.

The Helendale Fault consists of numerous echelon strands up to 2.5 miles long trending northwest. Total length of the strands is approximately 54 miles. Holocene surface faulting is evident along with closely associated small earthquakes. The fault is approximately 38 miles from the City of San Bernardino and is located along the north side of the San Bernardino Mountains and east of Victorville.

The Cleghorn Fault is a single strand trending northwest with probable Holocene offset and numerous small earthquake associated with the eastern end of the 14-mile-long trace. This fault is located along the northwest end of the San Bernardino Mountains is approximately 13 miles northwest of the city of San Bernardino.

The North Frontal Fault zone is comprised of numerous discontinuous acuate strands averaging 1.5 to 2.5 miles in length with a total overall length of about 30 miles. Late Quaternary offset occurs along the fault zone; however, overlying Holocene alluvial fans are not faulted. Numerous closely associated small earthquakes have been recorded near the eastern end of the zone. The zone is located along the north front of the San Bernardino Mountains approximately 17 miles north of the City of San Bernardino.

The Crafton Fault consists of accurate echelon strands about 5 miles in length with evidence of Late Quaternary offset. This fault is located approximately 7 miles south of the City of San Bernardino.

The Banning Fault zone consists of two to three strands in a zone about 2.5 miles wide trending from northwest to west with a total length of approximately 27 miles. Holocene strata are offset in the zone

and numerous small earthquakes are also closely associated with the zone. The fault zone is located approximately 16 miles south-southeast of the City of San Bernardino.

The Red Hill Fault is a presumed single strand fault trending northwest to nearly east-west with a length of about 9 miles. This fault extends through the Pomona area about 10 miles west of the City of San Bernardino. Holocene strata have been offset at the eastern end and scattered small earthquakes have occurred near the fault trace.

Surface (Fault) Rupture

As defined by the California Division of Mines and Geology (DMG), an active fault is one that has had surface displacement within Holocene time (roughly the last 11,000 years) and/or has an instrumental record of seismic activity while potentially active faults are those that show evidence of surface displacement during Quaternary time (the last two million years), but for which evidence of Holocene movement has not been established. Active faults are considered to be those most likely for renewal movement during the lifetime of any structures in a particular project and may be a possible source for surface ground displacement. The City of San Bernardino contains numerous strands of active faults that transverse the planning area, including the San Andreas and the San Jacinto faults. The Alquist-Priolo Earthquake Fault Zones Act requires the State Geologist to establish Earthquake Fault Zones to encompass all potentially active fault traces of the San Andreas and San Jacinto Faults. The Earthquake Fault Zones boundaries extend approximately 500 feet away from major active faults and about 200 to 300 feet away from well-defined minor faults. Within the City of San Bernardino planning area, the San Andreas Fault system and the San Jacinto Fault system, including the Glen Helen and Loma Linda Faults, are included within these Special Studies Zones.

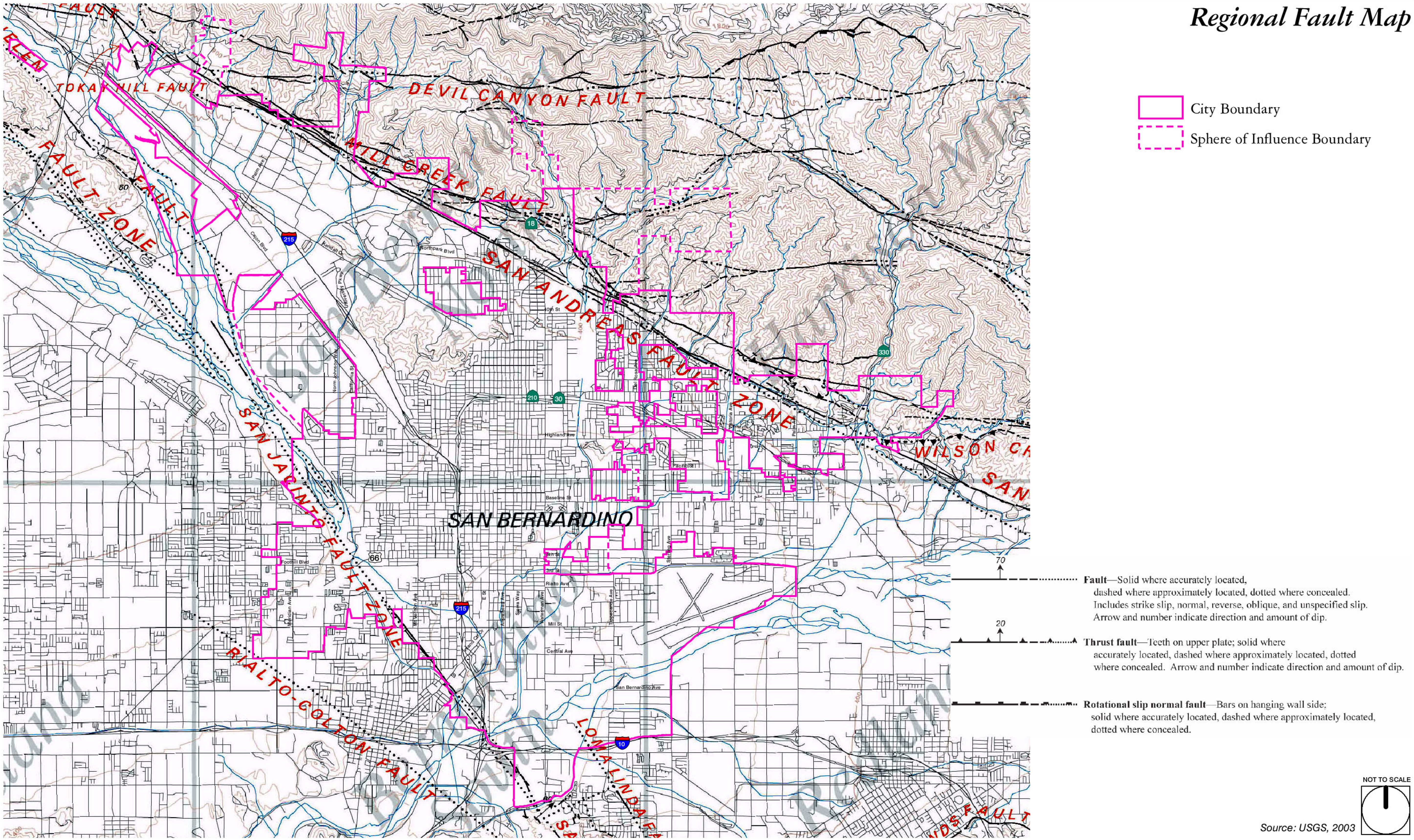
The locations of known faults within the City of San Bernardino are depicted in Figure 5.5-4, *Regional Fault Locations*. Faults in the City that are part of the Alquist-Priolo Earthquake Fault Zones are shown in Figure 5.5-5, *Alquist-Priolo Earthquake Fault Zones*, to show the location of known active faults that are defined as having the potential for surface rupture.

Strong Seismic Groundshaking

As seismic waves pass through the earth's crust, the severity and duration of ground-shaking at a particular site area depends on several factors including (1) total energy released from a particular magnitude earthquake in the form of seismic waves; (2) distance from the source of the earthquake; and (3) nature of the surface and subsurface earth materials including age, composition, density, thickness and water content.

The San Bernardino planning area has been regionally designated as a high severity zone where major probable damage of probable maximum intensity IX or X, as defined by the Mercalli Intensity Scale, may occur from a maximum expectable earthquake. The Mercalli Intensity Scale differs from the Richter Magnitude Scale in that the effects of any one earthquake vary greatly from place to place, so there may be many Intensity values measured from one earthquake. Each earthquake, on the other hand, should have just one Magnitude, although the several methods of estimating it will yield slightly different values. General structural damage on the Modified Mercalli Intensity Scale for IX and X includes masonry seriously damaged if reinforced, and destroyed if unreinforced, and general damage to wood frame structures.

Regional Fault Map



Source: USGS, 2003

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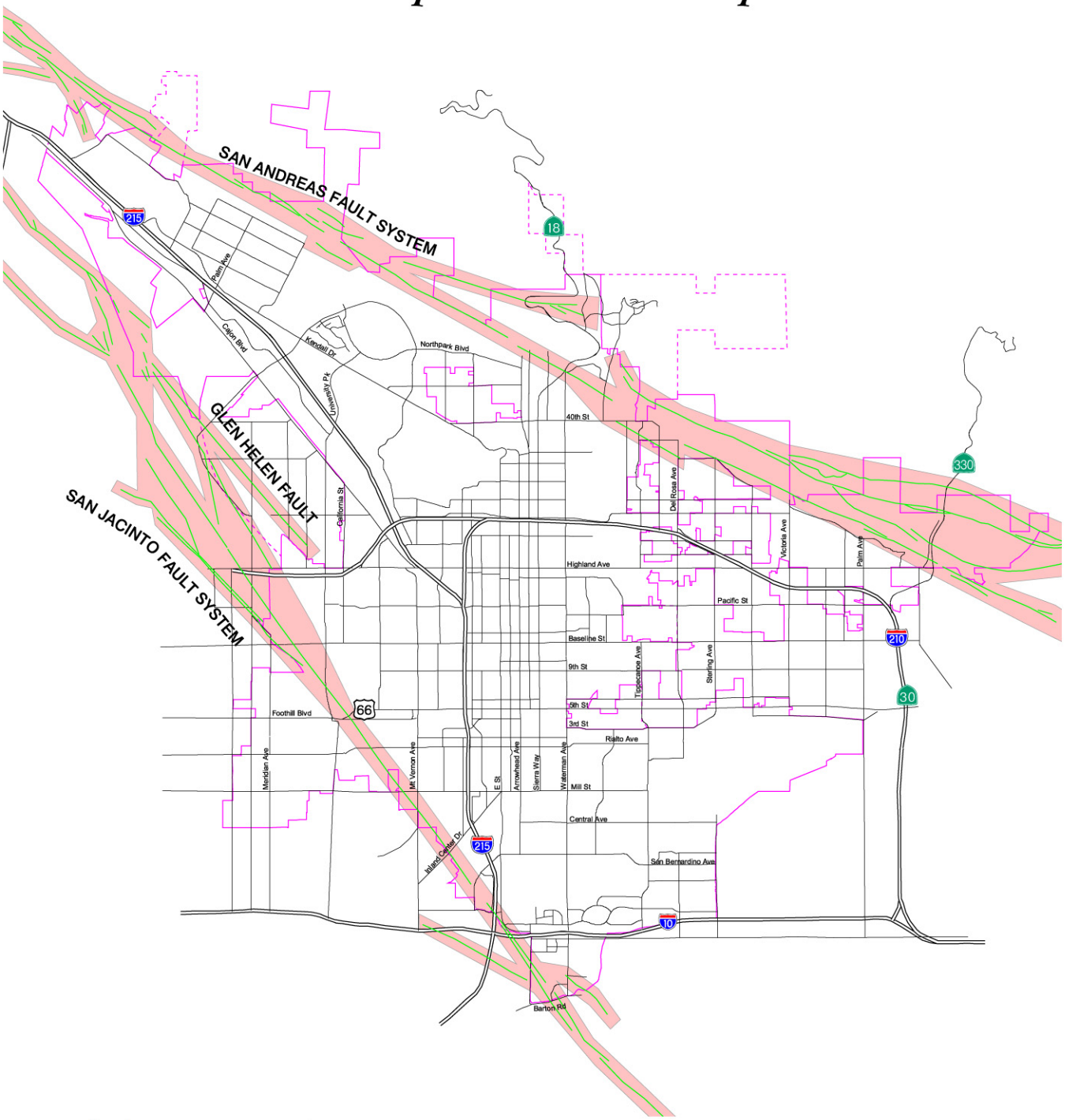
Alquist-Priolo Earthquake Fault Zones



Approximate Fault Location

Approximate location of Alquist Priolo Special Study Zones

City Boundary

Sphere of Influence Boundary

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Regional studies have suggested that various intensities of damage could be generated by either a maximum credible earthquake of 8.5 magnitude on the San Andreas Fault system, a maximum credible earthquake of 7.5 magnitude on the San Jacinto fault system, a maximum credible earthquake of 6.5 on the Cucamonga-Sierra Madre fault system, or a maximum credible earthquake of 7.5 magnitude on the Whittier-Elsinore fault system.

Seismically Induced Slope Failure

Currently, the City of San Bernardino is located outside a mapped area for Seismic Hazard Zones, which establishes regulatory zones that encompass areas prone to liquefaction (failure of water-saturated soil) and earthquake-induced landslides. However, the geologic setting of southern California locally is conducive to slope failures and slope-failure deposits (landslides) that can be a hazard to human life and property. These hazards are created when geologic materials are displaced down a topographic slope under the influence of gravity. Factors that determine slope-failure occurrence include: slope angle; geologic materials (substrate); climatic conditions; and earthquake shaking.[6] According to the Preliminary Soil-Slip Susceptibility Map for the southern half of San Bernardino, portions of the City of San Bernardino are located within areas designated as having either low, moderate, or high soil-slip susceptibility which could be induced seismically.[7]

Liquefaction and Related Ground Failure

Liquefaction is a process whereby strong earthquake shaking causes sediment layers that are saturated with groundwater to lose strength and behave as a fluid. This subsurface process can lead to near-surface or surface ground failure that can result in property damage and structural failure. If surface ground failure does occur, it is usually expressed as lateral spreading, flow failures, ground oscillation, and/or general loss of bearing strength. San boils (injections of fluidized sediment) can commonly accompany these different types of failure.

In order to determine a region's susceptibility to liquefaction, three major factors must be analyzed these include:

1) *The age and textural characteristic of the alluvial sediments*. Generally, the younger, less well compacted sediments tend to have a higher susceptibility to liquefaction. Textural characteristics also play a dominant role in determining liquefaction susceptibility. Sand and silty sands deposited in river channels and floodplains tend to be more susceptible to liquefaction and floodplains tend to be more susceptible to liquefaction than coarser or finer grained alluvial materials. In the San Bernardino area, finer grained alluvial deposits that have accumulated in the floodplains and channels of the Santa Ana River, Cajon Creek, and Lytle Creek are more susceptible to liquefaction than coarser grained materials deposited in alluvial fan areas nearer to the San Bernardino Mountain front.

2) *The intensity and duration of ground-shaking: in the San Bernardino area*. It is probable that the tectonic setting and seismic history of the region suggest that earthquakes strong enough to generate liquefaction in susceptible alluvial materials have occurred in the past and are likely to occur in the future from fault movement on the San Andreas Fault, the San Jacinto Fault, and the Cucamonga Fault.

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[6] United States Geological Survey. *Southern California Geology. Slope failure hazards in Southern California*. Obtained on February 11, 2005 from http://scamp.wr.usgs.gov/scamp/html/scg_slop.html

[7] Morton, D.M, Alvarez, R.M & Campbell, R.H. *Soil-Slip Susceptibility Map for the South Half of the San Bernardino 30' x 60' Quadrangle, Southern California.* Preliminary Soil-Slip Susceptibility Maps, Southwestern California. 2003

3) *The depth to the groundwater*: Groundwater saturation of sediments is required in order for earthquake induced liquefaction to occur. In general, groundwater depths shallower than ten feet to the surface can cause the highest liquefaction susceptibility. This factor is the most variable and may be the most important determinant because of the rapid changes in the historical groundwater levels in the Bunker Hill and San Timoteo Groundwater Basin that underlies the City of San Bernardino.

Currently, the City of San Bernardino is located outside a mapped area for Seismic Hazard Zones, which establishes regulatory zones that encompass areas prone to liquefaction (failure of water-saturated soil) and earthquake-induced landslides. However, two general zones have been identified within the regional area, "high" and "moderately high to moderate" zones based on past technical studies. High zones are concentrated adjacent to the San Andreas Fault zone north and northeast of the City and in the old artesian area between the San Andreas and San Jacinto Faults in the central and southern parts of the City. These zones delineate regional susceptibility; however, they can vary greatly due to groundwater level changes. These zones are depicted in Figure 5.5-6, *Liquefaction Susceptibility*.

Hazardous Buildings (Unreinforced Masonry)

The principal threat in an earthquake is not limited to ground-shaking, fault rupture, or liquefaction, but the damage that the earthquake causes to buildings that house people or an essential function. Continuing advances in engineering design and building code standards over the past decade have greatly reduced the potential for collapse in an earthquake of most of our new buildings. However, many buildings were built in past decades, before some of the earthquake design standards were incorporated into the building code. Several specific building types are a particular concern in this regard.

Unreinforced Masonry Buildings

In the late 1800s and early 1900s, unreinforced masonry was the most common type of construction for larger downtown commercial structures and for multi-story apartment and hotel buildings. These were recognized as a collapse hazard following the San Francisco earthquake of 1906, Santa Barbara earthquake of 1925, and again the aftermath of the Long Beach earthquake of 1933. These buildings are still recognized as the most hazardous buildings in an earthquake. Because of the concentrated development of the San Bernardino planning area by the early 1930s, a substantial number of unreinforced masonry buildings may still exist within the City.

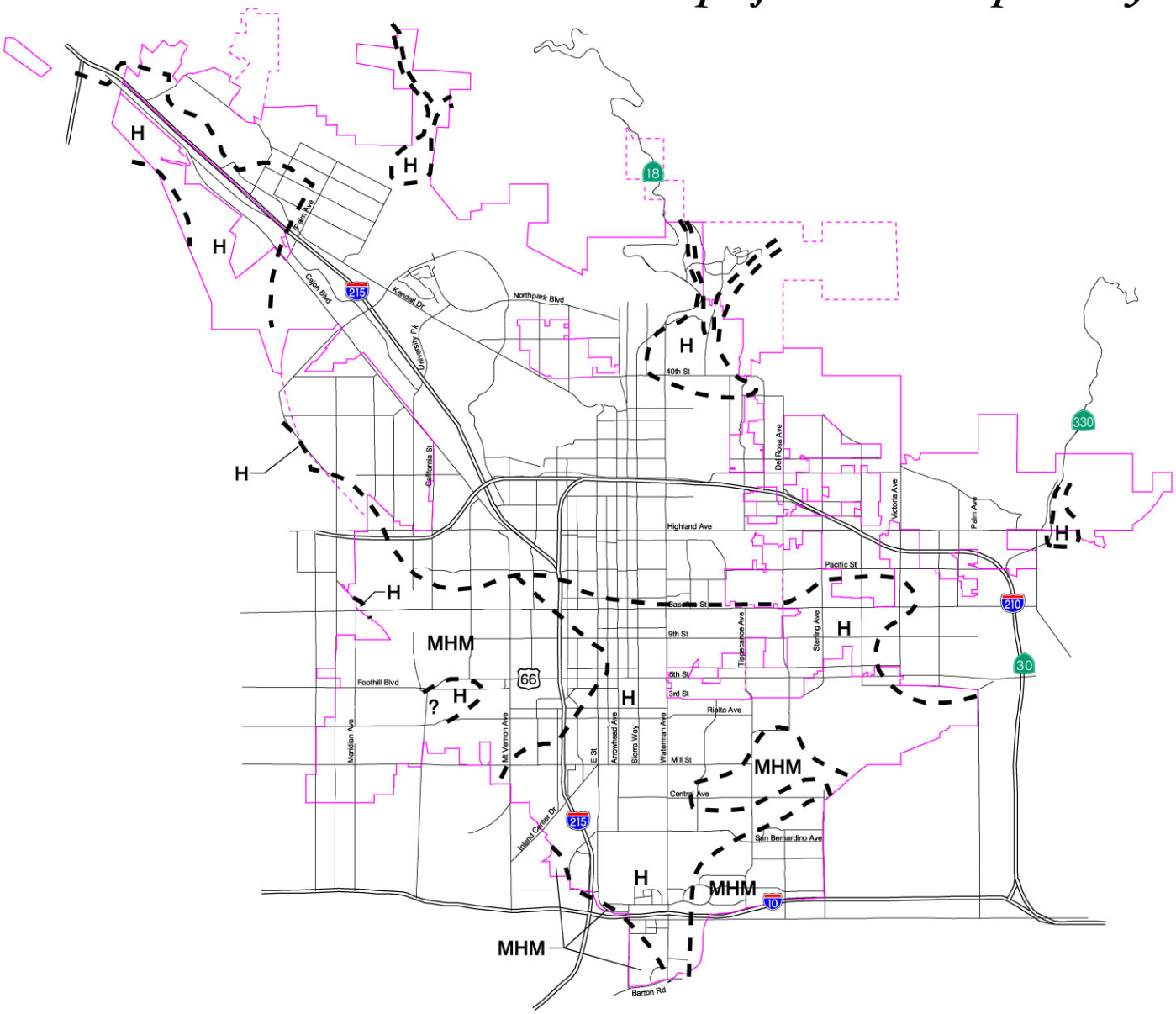
Per Senate Bill 547, local jurisdictions are required to enact structural hazard reduction programs by (a) inventorying pre-1943 unreinforced masonry buildings, and (b) developing mitigation programs to correct the structural hazards. Currently, the City maintains a list of pre-1943 unreinforced masonry buildings within the City, which are predominantly located in the central city, north of Mills Street, South of 30th Street, east of Rancho Avenue and west of Waterman Avenue. Currently there are 136 unreinforced masonry buildings in the City[8].

Pre-cast Concrete Tilt-up Buildings

This building type was introduced following World War II and gained popularity for use in light industrial development during the late 1950s and 1960s. Extensive damage to concrete tilt-up buildings in the 1971 San Fernando earthquake revealed the need for better anchoring of walls to the roof, floor and foundation elements of the building, and for stronger roof diaphragms. In the typical damage to these buildings, the concrete wall panels would fall outward and the adjacent roof would collapse creating a direct life hazard.

[8] Personal communication with Lease Jo at the City of San Bernardino on February 17, 2005.

Liquefaction Susceptibility



H Approximate Location of Areas of High Liquefaction Susceptibility

HMH Approximate Location of Areas of Moderately High to Moderate Liquefaction Susceptibility

City Boundary

Sphere of Influence Boundary

Note: Not to be used as a substitute for site-specific geotechnical iquefaction induced ground failures should be addressed. Boundaries between susceptibility zones will shift if ground water conditions raise or lower over time. Zonations based on sub-surface geology, ground water levels, and maximum credible earthquakes on the San Andreas Fault System, the San Jacinto Fault System and the Cucamonga Fault. (After Matti and Carson, 1986)

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New design standards for tilt-up buildings, developed after the 1971 earthquake, were incorporated into the 1976 Uniform Building Code. However, a large majority of existing tilt-up buildings were designed under the former code standards and may be subject to collapse under strong ground-shaking. Light industrial or commercial areas of the City that were developed in the late 1950s and 1960s may contain these types of buildings.

The older tilt-up construction was used primarily for single-story industrial and warehouse buildings with solid wall panels and few or no window openings. However, recent application of tilt-up construction techniques has expanded to two- and three-story commercial, retail and mass housing uses, with poor connection details and a high proportion of glass openings in the wall panels. Other adaptations combine concrete, masonry, and cast-in-place concrete in a complex manner that no longer retains the seismic integrity of the original code intent.

Soft-Story Buildings

"Soft-Story" buildings are those in which at least one story, commonly the ground floor, has significantly less rigidity and/or strength than the rest of the structure. This can form a weak link in the structure, unless special design features are incorporated to give the building adequate structural integrity. Typical examples of soft-story construction are buildings with glass curtain walls on the first floor only, or buildings placed on stilts or columns, leaving the first story open for landscaping, street-friendly building entry, parking, or other purposes. The failure of the modern Olive View Hospital in the 1971 San Fernando earthquake, as well as the Imperial County Service Buildings in the 1979 Imperial Valley event, led to the repeated recognition of the seismic vulnerability of soft-story construction.

In the early 1950s to early 1970, soft story buildings were a popular construction style for low- and mid-rise concrete frame structures. The City of San Bernardino may still have a number of concrete frame buildings of this vintage.

Non-Ductile Concrete Frame Buildings

The brittle behavior of non-ductile concrete frame buildings can create major damage and even collapse under strong ground-shaking. This type of construction, which generally lacks masonry shear walls, was common in the very early days on reinforced concrete buildings, and they continued to be built until the codes were changed to require ductility in the moment-resisting frame in 1973.

Large numbers of these buildings were built for commercial and light industrial use in California's older, densely populated cities. Many of these are four to eight stories; however, many others are in the lower height range. This category also includes one-story parking garages with heavy concrete roof systems supported by nonductile concrete columns. The history of construction in the City of San Bernardino spans the dates and uses common for this potentially hazardous building type.

5.5.1.2 Arrowhead Springs

The Arrowhead Springs Specific Plan area is located in the northeastern portion of the San Bernardino planning area. Generally, the Arrowhead Springs Specific Plan area has the same regional geological setting as the City of San Bernardino as they are adjacent to each other. However, while the City lies mainly at the base of the steeper slopes of the San Bernardino Mountains, the Arrowhead Springs planning area extends up the flank of the San Bernardino Mountains. The Arrowhead Springs Specific Plan area lies at an elevation of 1,480 feet to 2,400 feet above mean sea level (msl). Arrowhead Springs is located in the Waterman Canyon (West Twin Creek) and East Twin Creek Watersheds and three primary water courses flow through the planning area: the East Twin Creek, Strawberry Creek, and West Twin Creek which flows through Waterman Canyon. The Arrowhead Springs planning area can generally be described as hilly marked with sharp terrain, valleys, and inaccessible steep slopes of the San Bernardino Mountains.

In general the Arrowhead Springs Specific Plan area consists of numerous small canyons trending north-south. Ridges are underlain by either Potato Formation or by granitic-metamorphic complex. These units are deeply weathered and are offset by faulting of uncertain age. Hot springs travertines and quartz deposits mark the ridge exposures of these faults as do active hot springs. Deep cut for roads and tanks all exhibit the deep weathering as do steep-walled ravines cut into these crystalline basement units.

Within areas of the upper plateau and ridges, near the south, the subgrade soils are comprised of moderately dense, deeply weathered gravely sand with some silts. Within the upper plateau and hillsides near the north, subgrades are expected to consist of grayish brown to gray highly fractured metamorphic rocks, weathered gravelly sand of decomposed granitic origin, and/or calcite as derived from old hot springs.

Within the canyon bottoms, subgrade soils consist of alluviums of silty fine sand and fine to medium coarse gravelly sand of variable consistency along with numerous cobbles and isolated rocks. Subgrade soils underlying the upper described alluviums are expected to consist of well consolidated gravelly sand or weathered bedrock of siltstone/sandstone origin, generally compressible in nature. Figure 5.5-7 shows the major geologic units in the vicinity of the Arrowhead Springs area.

Geothermal Activity

The hot springs in the Arrowhead Springs Specific Plan area are actually located in two canyons in the foothills of the San Bernardino Mountains on a splay of the San Andreas Fault. The splay seems to be related to the bifurcation of the fault into the northern and southern segments which continue southeast toward the Salton Trough. The hot springs in the area are divided into two distinct groups and are located in two canyons about one-half mile apart on the property.

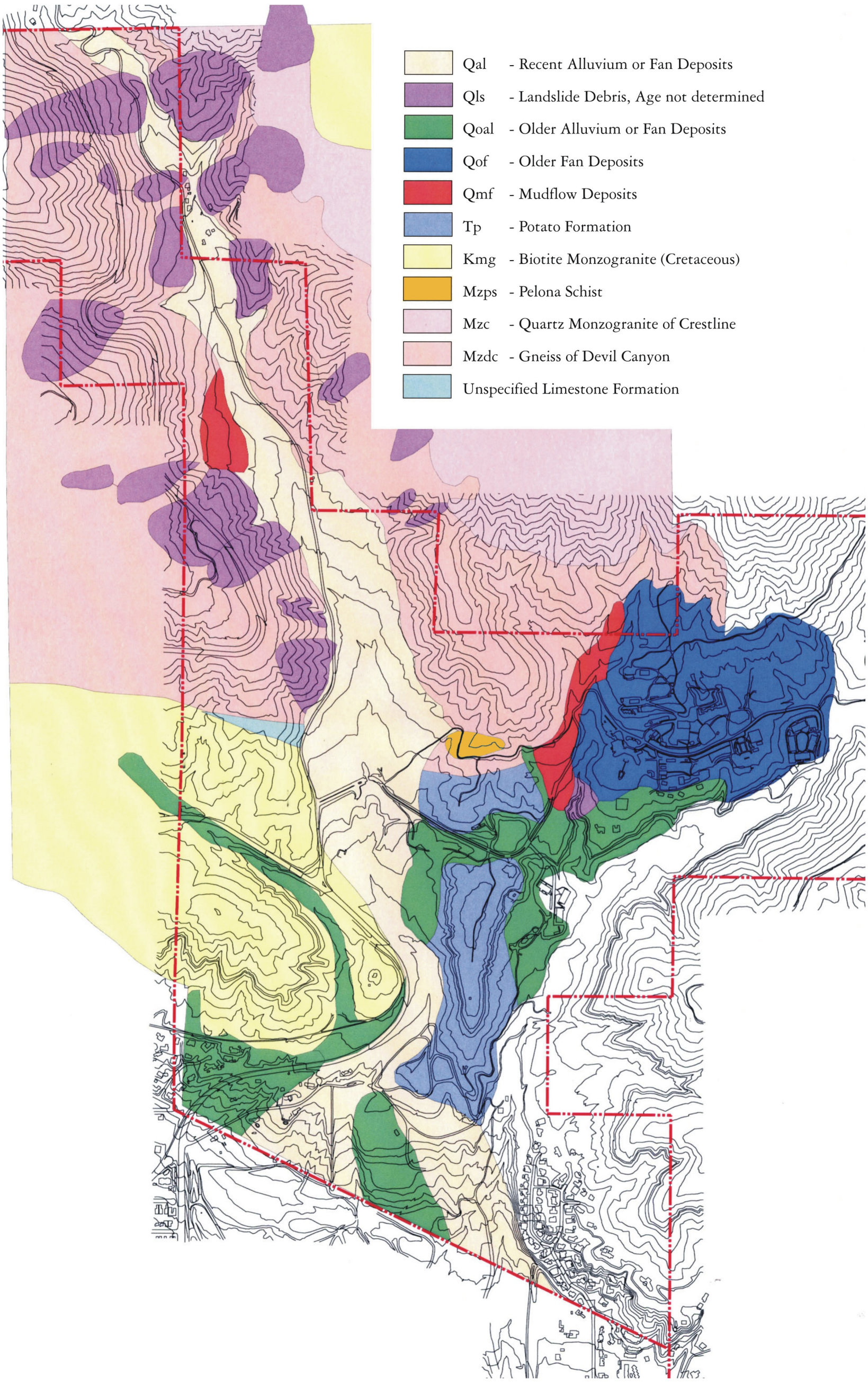
The Arrowhead hot springs are located on the south flank of the San Bernardino Mountains (near the historic resort). The Arrowhead hot springs are comprised of the Pal Hot Springs, Penuygal Hot Springs, and Granite Hot Springs. Table 5.5-3 displays the 1910 and 1980–1981 recorded temperatures at these hot springs at the Arrowhead hot springs location and the Waterman hot springs (near Waterman Canyon). The area has been developed as a bathing spa and recreational area since the late 1800s, and most of the original hot spring locations have been altered from their original character by the construction of baths and collection pools. The California Division of Mines and Geology, 1975 noted that one spring at the Arrowhead hot springs actually boils having a temperature of 99°C (210°F).

Table 5.5-3
Recorded Temperatures at the Arrowhead Hot Springs

Location	*1910 Temperature*	*1980–1981 Temperature*
Palm Hot Springs	82°C (180°F)	84°C (183°F)
Penuygal Hot Springs	94°C (202°F)	87°C (189°F)
Granite Hot Springs	70°C (159°F)	81°C (178°F)
Waterman Hot Springs	70-93°C (158–200°F)	81°C (178°F)

Source: California Department of Conservation, Division of Mines and Geology. Resource Investigation of Low- and Moderate-Temperature Geothermal Areas in San Bernardino California. DMG Open –File Report 82-11, 1981

Arrowhead Springs Geologic Map



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Source: Soils Southwest, Inc.

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Geothermal temperatures at Arrowhead hot springs have changed very little in the past 100 years. Today there is still near boiling water issuing from the surface. Two springs, the Palm Hot Springs and Granite Hot Springs, are currently hotter than 1910 measurements. At these locations, wells were drilled and hot water now flows from some unknown depth rather than naturally emitting at the surface. Penuygal Hot Springs is cooler than known 1910 temperatures and sediment and debris may be impeding the natural flow to the surface. This impedance may allow the waters to cool more near the surface than in the past when the spring was maintained.

The Waterman hot springs are approximately one-half mile west of the Arrowhead hot springs. The hot waters issue from an alluvial terrace deposit that, along a short stretch, forms the east bank of the Waterman Canyon. Four caves were dug into the side of the alluvial fill covering fractured bedrock from which steam and hot water was flowing. Currently, the caves are bulldozed over to keep out trespassers and still show signs of warm ground and surface steam. Historically, the temperatures of the steam caves were described as being dependent on the location with respect to the fault which lies directly to the east. The temperature was observed to decrease regularly as the distance from the fault increased.[9]

The Arrowhead of Arrowhead Springs

A unique geologic feature on the slopes of Arrowhead Peak above the Arrowhead Springs resort area is the outline of an Indian arrowhead from which the resort and mountain is named. The arrowhead is 1,115 feet long and 396 feet wide. The arrowhead is clearly visible on the mountain because it appears to be white against a dark background. The soil which forms this mark is composed mostly of disintegrated white quartz and light gray granite, on which grow weeds and a short, white grass, while the soil around it is of a different formation, sustaining vegetation and shrubs of a dark green color, which covers the rest of the face of the mountain.[10] In 1957, the United States National Forest Service designated the natural Arrowhead a "Landmark Geological Area." The Arrowhead can be seen in the lower photo of Figure 5.1-4 in Section 5.1, *Aesthetics*.

Geologic Hazards (Site Specific to AHS)

Slope Failure (Landslides)

Numerous landslides are present in the Arrowhead Springs area, comprised of remnants of bedrock of broken sandstone with gravel deposits, related to localized slumping of weathered bedrock materials. Minor surficial slopewash and/or minor surficial slides may be associated with the north-south direction canyons near the northwest of the Arrowhead Springs Specific Plan area. Slope surface includes minor slippage along with upper loose silty gravelly sand (top-soils), overlying moderately dense gravelly sand and/or weathered and fractured bedrock.

Compressible Soils

Compression of the soils brought about by an increase in stress from construction, foundation or other which results in a deformation and relocation of soil particles, and expulsion of water or air from void spaces. In the Arrowhead Springs Specific Plan area, upper alluviums in canyon bottoms are generally considered compressible in nature and consist of well consolidated gravelly sand or weathered bedrock of siltstone/ sandstone origin. Consolidation tests conducted on representative undisturbed soils sampled at depth and on remolded bulk soil sample exhibited relatively "low" compressibility under anticipated structural loading.

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[9] Jones, Victor T. & Burtell, S.G. (2002) Hydrocarbon Flux Variations in Natural and Anthropogenic Seeps. Exploration Technologies, Inc. Obtained from http://www.eti-geochemistry.com/flux/

[10] California Genealogy. *Additional Towns of San Bernardino County, California, Arrowhead Hot Springs*. Obtained March 2005 from http://www.californiagenealogy.org/sanbernardino/towns2.htm

Expansion tests conducted on representative near grade soils exhibited “very low” expansion potential with Expansion Index (EI) less than 20.

Ground Subsidence

Subsidence of the ground surface is generally caused by the withdrawal of groundwater and/or hydrocarbons. Withdrawal of groundwater in the Arrowhead Springs Specific Plan area has traditionally been associated with domestic use, irrigation and heating from the geothermal wells. However, groundwater levels in the southern boundary of Arrowhead Springs and along the National Forest boundary areas are expected at about 10 feet below grade. Shallow depth groundwater, however, should be expected within the southern low-lying areas.

Erosion

See above discussion pertaining to erosion for the San Bernardino area.

Seismic Hazards (applicable site specific to AHS)

Earthquake Faults Including Information on Historic Earthquakes

See above discussion pertaining to earthquake faults for the San Bernardino area.

Surface (Fault) Rupture

The southern flank of the San Bernardino Mountains is bounded by the San Andreas Fault zone, which is a designated Alquist-Priolo zone. Portions of the Alquist-Priolo zones exist on the west side and southerly end of the project area (see Figure 5.5-5). However, these active faults have not been trenched to locate fault traces in a precise manner.

Strong Seismic Groundshaking

The entire planning area of Arrowhead Springs lies in the near source zone of the San Andreas Fault. The Arrowhead Springs Specific Plan area is located 7 kilometers from the near source zone of the Class B Frontal Fault system, 13 kilometers from this zone of the Class A Cucamonga Fault system and 9 kilometers from the near source zone of the San Jacinto Fault. Earthquakes on these faults could generate vibrations on site with maximum horizontal accelerations ranging from 0.4g to 0.7g and with durations of string shaking exceeding 20 seconds.

Seismically Induced Slope Failure

See above discussion pertaining to seismically induced slope failure for the San Bernardino area.

Liquefaction and Related Ground Failure

Liquefaction is caused by build-up of excess hydrostatic pressure in saturated cohensionless soils due to cyclic stress generated by ground-shaking during an earthquake. The significant factors on which liquefaction potential of a soil deposit depends, among others include, soil type, relative soil density, intensity of earthquake, duration of ground-shaking, and depth of groundwater.

Liquefaction is possible near the southerly end of the project due to the high groundwater. Natural spring water is expected during grading and construction. Shallow depth groundwater, however, should be expected within the southern low-lying areas. As per USGS Bulletin 1898, groundwater within the southern boundary of Arrowhead Springs and along the National Forest boundary areas are expected at about 10 feet below grade.

Hazardous Buildings (Unreinforced Masonry)

See above discussion pertaining to hazardous buildings for the San Bernardino area.

5.5.2 Thresholds of Significance

According to Appendix G of the CEQA Guidelines, a project would normally have a significant effect on he environment if the project would:

G-1 Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:

- Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? (Refer to Division of Mines and Geology Special Publication 42.)
- Strong seismic ground-shaking.
- Seismic-related ground failure, including liquefaction

G-2 Result in substantial soil erosion or the loss of topsoil.

G-3 Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project and potentially result in on-or off-site landslide, lateral spreading, subsidence, liquefaction or collapse.

G-4 Be located on expansive soil, as defined in Table 18-1B of the Uniform building Code (1994), creating substantial risks to life or property.

G-5 Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water.

The Initial Study, included as Volume II, Appendix A, substantiates that impacts associated with threshold G-5 would be less than significant. This threshold will not be discussed further in this EIR.

5.5.3 Environmental Impacts

5.5.3.1 San Bernardino General Plan Update

The following impact analysis addresses thresholds of significance for which the Initial Study disclosed potentially significant impacts. The applicable thresholds are identified in parentheses after the impact statement.

GP IMPACT 5.5-1: CITY OF SAN BERNARDINO RESIDENTS, VISITORS, AND WORKERS WOULD BE SUBJECTED TO POTENTIAL SEISMIC-RELATED HAZARDS. [THRESHOLD G-1]

Impact Analysis: The City of San Bernardino and Sphere of Influence areas (SOI) are crisscrossed by numerous faults and trace faults, many of which are located within the Alquist-Priolo Earthquake Fault Zone. Faults located within the Alquist-Priolo Earthquake Fault Zone are considered to have been active during the Holocene time and therefore have the potential for surface rupture. In addition to active faults in the Alquist-Priolo Earthquake Fault Zone, other active faults also crisscross through the San Bernardino planning area, which also have the potential for surface rupture. In accordance with the Unreinforced Masonry Law the City

of San Bernardino has identified structures within the City, which may be hazardous in the event of surface rupture. Structures and persons residing in these structures within the Earthquake Fault Zone and within close proximity to other active faults within the City of San Bernardino may be exposed to substantial adverse effects, such as potential structural collapse, in the event of surface rupture.

Due to the proximity and location of these active faults in relation to the City of San Bernardino planning areas, all structures within the City of San Bernardino planning area may be subject to seismic related impacts from severe ground-shaking. The San Bernardino planning area has been regionally designated as a high severity zone where major probable damage of probable maximum intensity IX or X, as defined by the Mercalli Intensity Scale, may occur from a maximum expectable earthquake. Structures and persons residing in these structures during periods of severe ground-shaking located within the City of San Bernardino may be exposed to substantial adverse effects.

In addition to impacts from surface rupture and severe ground-shaking, many locations within the City are located in areas with "high" and "moderately-high to moderate" liquefaction potential which can be induced by seismic activity and can result in structural failure. Structures and persons residing in these structures within areas designated "high" and "moderately-high to moderate" liquefaction potential located within the City of San Bernardino may be exposed to substantial adverse effects in the event of structural failure as a result of liquefaction.

GP IMPACT 5.5-2: UNSTABLE GEOLOGIC UNIT OR SOILS CONDITIONS, INCLUDING SOIL EROSION, COULD RESULT FROM IMPLEMENTATION OF THE CITY OF SAN BERNARDINO GENERAL PLAN. [THRESHOLDS G-2 AND G-3]

Impact Analysis: The City of San Bernardino lies within a geological unit that contains soil types that are susceptible to both wind and water erosion which may be indicative of unstable geological conditions for development. Fine sandy soils found in the City of San Bernardino, such as the Delhi fine sand and the Tujunga loamy sand, are both susceptible to wind erosion if left exposed without adequate vegetative cover. The Cienaba sandy loam, Friant rock outcrop, Greenfield sandy loam, and Saugus sandy loam, which commonly occur on alluvial fans, hills, and at the base of the San Bernardino Mountain front, are susceptible to water erosion. Hillside grading without proper erosion control plans, and off-road vehicle use in areas of erosion-prone soils can increase these hazards. Development within areas that are characterized by these soil types within the City of San Bernardino may result in substantial soil erosion or the loss of topsoil.

Hillside areas within the City of San Bernardino planning area are located in areas designated as having low, moderate, or high soil-slip susceptibility, which can be induced seismically. Common names for landslide types include slump, rockslide, debris slide, lateral spreading, debris avalanche, earth flow, and soil creep. Areas of low relief with low to moderate susceptibility may contain small scale surficial soil slips, debris flow and mudflows on steep localized slopes. Areas of moderate and high relief with low to moderate susceptibility may contain small to large rotational slides, debris slides and combinations of surficial slides and flows. Development located on these hillside areas is therefore susceptible to potential landslides.

Portions of the City of San Bernardino planning area have been identified to have the potential for liquefaction and subsidence susceptibility, which could result in structural collapse if development were to occur. Continued overdraft of the Bunker Hill-San Timoteo Basin could lead to an increase in susceptibility to impacts from subsidence as a decrease in groundwater levels could initiate sinking to fill the empty space previously occupied by water or soluble minerals. This can be aggravated by weight, including surface developments such as roads, reservoirs, and buildings, and man-made vibrations from such activities as blasting, heavy truck or train traffic which can accelerate the natural processes of subsidence. However, groundwater recharge in the Bunker Hill-San Timoteo Basin has significantly reduced this hazard by reducing overdraft in the Basin.

In the San Bernardino planning area, finer grain alluvial deposits that have accumulated in floodplains of the Santa Ana River are more susceptible to liquefaction than coarser grained materials deposited in alluvial fan areas nearer to the San Bernardino Mountain Front. However, groundwater level is the most important determinant to liquefaction potential because of the rapid changes in the historic groundwater levels in the San Bernardino planning area. Groundwater saturation of the sediments is required in order for earthquake induced liquefaction to occur. Groundwater depth shallower than 10 feet to the surface can cause the highest liquefaction potential. Groundwater 10 to 30 feet below the surface can create a moderately high to moderate liquefaction potential. Groundwater 30 to 50 feet deep can create a moderate to low susceptibility. Historically, 1973 to 1983, groundwater levels in the old artesian area were within 10 feet or less of the surface and therefore historically have had a high liquefaction potential. In addition, due to the constrictive nature of groundwater movement along fault lines, groundwater levels along the San Andreas, San Jacinto, and the Cucamonga Faults in San Bernardino planning area are also known to have moderate to moderately high liquefaction potential.

GP IMPACT 5.5-3: SOIL CONDITIONS PRESENT WITHIN THE CITY OF SAN BERNARDINO COULD RESULT IN RISKS TO LIFE OR PROPERTY. [THRESHOLD G-4]

Impact Analysis: Expansive soils are defined as soils that shrink when dry and swell when wet. These characteristics apply to soils with a high percentage of clay. Movement that occurs during expansion can exert enough pressure to crack sidewalks, driveways, basement floors, pipelines and even foundations. Table 5.5-1 lists the soil types found within the City of San Bernardino. Although commonly found soils within the City are not characterized as expansive, the potential to encounter expansive soils within the City may exist. Potential risks to life or property, due to structural collapse as a result of construction on expansive soils could therefore occur within the City.

City of San Bernardino General Plan Policies and Programs

The following City of San Bernardino General Plan policies and programs related to geological hazards include:

Safety Element

Policy 10.7.1: Minimize the risk to life and property through the identification of potentially hazardous areas, establishment or proper construction design criteria, and provision of public information.

Policy 10.7.2: Require geologic and geotechnical investigations for new development in areas adjacent to known fault locations and approximate fault locations as part of the environmental and/or development review process and enforce structural setbacks from faults identified through those investigations.

Policy 10.7.3: Enforce the requirements of the California Seismic Hazards Mapping and Alquist-Priolo Earthquake Fault Zoning Act when siting, evaluating, and constructing new projects within the City.

Policy 10.7.4: Determine the liquefaction potential at a site prior to development, and require that specific measures be taken as necessary, to prevent or reduce damage in an earthquake.

Policy 10.7.5: Evaluate and reduce the potential impacts of liquefaction on new and existing lifelines.

Policy 10.8.1: Enforce the requirements of the California Seismic Hazards Mapping and Alquist-Priolo Earthquake Fault Zoning Acts when siting, evaluating, and constructing new projects in the City.

Policy 10.8.2: Require that lifelines crossing a fault be designed to resist the occurrence of fault rupture.

Policy 10.8.3: Adopt a program for the orderly and effective upgrading of seismically hazardous buildings in the City for the protection of health and safety. Compliance with the Unreinforced Masonry Law shall include

the enactment of an effective program for seismic upgrading of unreinforced masonry buildings within the City.

Policy 10.9.1: Minimize risk to life and property by properly identifying hazardous areas, establishing proper construction design criteria, and distribution of public information.

Policy 10.9.2: Require geologic and geotechnical investigations in areas of potential geologic hazards as part of the environmental and/or development review process for all new structures.

Policy 10.9.3: Require that new construction and significant alterations to structures located within potential landslide areas be evaluated for site stability, including potential impact to other properties during project design and review.

5.5.3.2 Arrowhead Springs

The Arrowhead Springs Specific Plan details the overall development that would occur in the 1916 acre plan area. The Arrowhead Springs Specific Plan would result in balanced cut and fill of approximately 7,000,000 cubic feet of soil to accommodate the proposed pads sites. An additional 1,000,000 cubic yards of cut and fill maybe required for remedial grading to ensure stability of slopes where potential for landslides is evident. For a map of the conceptual grading plan refer to Figure 3.3-7 in Section 3.0, *Project Description*.

Most of the planned development pad sites should be accessible using a dozer and a tractor-mounted backhoe and the general project area is considered acceptable for a drill-rig. Extensive site preparation and grading are anticipated due to the varied terrain that consists of valleys, some with steep canyon walls and ridges.

Existing slope gradients are estimated to vary anywhere from approximately 1:1: to 2:1 (horizontal to vertical) or flatter. Minor surficial slopewash and/or minor surficial slides are present in multiple locations. All permanent manufactured slope banks are not expected to be constructed at a gradient greater than 2:1 (horizontal to vertical), while cut slopes will not exceed 1:1. Exceptions may be made in the case of rock or natural outcroppings. Grading in certain areas of the Specific Plan is anticipated to require major cuts into upper plateaus and ridges of up to 50 feet and to about 20 feet on hillsides. No blasting or jack-hammering is anticipated. New fill soil placements are anticipated for the valleys and most pad sites.

The following impact analysis addresses thresholds of significance for which the Initial Study disclosed potentially significant impacts. The applicable thresholds are identified in parentheses after the impact statement.

AHS IMPACT 5.5-1: FUTURE RESIDENCES, VISITORS, AND WORKERS WOULD BE SUBJECTED TO POTENTIAL SEISMIC-RELATED HAZARDS WITHIN THE ARROWHEAD SPRINGS SPECIFIC PLAN AREA. [THRESHOLD G-1]

Impact Analysis: The Arrowhead Springs Specific Plan area is crisscrossed by numerous faults and trace faults, some of which are associated with the Alquist-Priolo Earthquake Fault Zone (refer to Figures 5.5-4 and 5.5-5 for approximate location of active and inactive faults and faults within the Alquist-Priolo Earthquake Fault Zone). Although the majority of the residential and commercial development is located outside the Earthquake Fault Zone, portions of the Arrowhead Springs Specific Plan designated as residential in the southernmost portions of the planning area are located within the Earthquake Fault Zone. In addition, active fault traces are known to cross the area proposed for commercial uses. Structures and persons residing in these structures within the Earthquake Fault Zone and within close proximity to other active faults within the Arrowhead Springs Specific Plan area may be exposed to substantial adverse effects in the event of surface rupture.

Due to the proximity and location of active faults in relation to the Arrowhead Springs Specific Plan area, all structures within the planning area may be subject to seismic related impacts from severe ground-shaking. Earthquakes could generate vibrations on site with maximum horizontal accelerations ranging from 0.4g to 0.7g and with durations of string shaking exceeding 20 seconds. Structures and persons residing in these structures during periods of severe ground-shaking located within the Arrowhead Springs Specific Plan area may be exposed to substantial adverse effects.

In addition to impacts from surface rupture and severe ground-shaking, many locations within the Arrowhead Springs Specific Plan area are located in areas with potential for liquefaction do to groundwater levels within 10 feet of the surface. Structures and persons residing in these structures if liquefaction were to occur within the Arrowhead Springs Specific Plan area may be exposed to substantial adverse effects in the event of structural failure as a result of liquefaction.

AHS IMPACT 5.5-2: UNSTABLE GEOLOGIC UNIT OR SOILS CONDITIONS, INCLUDING SOIL EROSION, COULD RESULT DUE TO BUILD-OUT OF THE ARROWHEAD SPRINGS SPECIFIC PLAN. [THRESHOLDS G-2 AND G-3]

Impact Analysis: Much of the area located within the Arrowhead Springs Specific Plan is located in areas designated as having either low, moderate, or high soil-slip susceptibility, which can be induced seismically. According to results of shear tests, exposed slope surface areas and ridge tops under increased moisture conditions indicate moderate shear strengths for slope stability. The proposed development plan of the Arrowhead Springs Specific Plan would result in slope modification and cuts into the ridges and manufactured slopes. Approximately 7,000,000 cubic yards of balanced cut and fill would be required to support individual proposed building pads envisioned in the Arrowhead Springs Specific Plan. In order to support existing and man made slopes proposed in the Conceptual Grading Plan, remedial grading of an additional 1,000,000 cubic yards would be required to prevent erosion or potential for landslides within the planning area. Modification of the existing geography in the Arrowhead Springs Specific Plan could therefore have the potential to increase soil-slip susceptibility hazards.

In the Arrowhead Springs Specific Plan area, valley areas are considered susceptible to soil consolidation which can result in unequal settlements to footings and are considered unsuitable for structural support or new structural fill soils placement. These undesirable site soils are also expected to exist within 5 feet of the surface on the upper ridges and upper plateau, and within 12 to 18 feet or more of the surface in the canyon bottoms. In addition, site soils are considered highly susceptible to caving. Soil consolidation and caving can lead to possible structural collapse.

Hot springs and geothermal activity within the Arrowhead Springs Specific Plan area are indicative of the potential to encounter high groundwater levels. In addition, portions of the Arrowhead Springs planning area are identified on Figure 5.5-6 as having high susceptibility to liquefaction. As a result, portions of the project area may have the potential for liquefaction, which could result in structural collapse if development were to occur.

Due to high depth of groundwater, the Arrowhead Springs Area is not considered susceptible to subsidence.

AHS IMPACT 5.5-3: SOIL CONDITIONS PRESENT WITHIN THE ARROWHEAD SPRINGS SPECIFIC PLAN AREA COULD RESULT IN RISKS TO LIFE OR PROPERTY. [THRESHOLD G-4]

Impact Analysis: Expansive soils are defined as soils that shrink when dry and swell when wet. These characteristics apply to soils with a high percentage of clay. Movement that occurs during expansion can exert enough pressure to crack sidewalks, driveways, basement floors, pipelines and even foundations. The Arrowhead Springs area is located in the mountainous regions of the City of San Bernardino and the

potential to encounter soils with expansive properties is low according to the geotechnical study for the site conducted by Soils Southwest Inc. (see Appendix D. Vol. III).

Arrowhead Springs Specific Plan Development Standards

The following general development standards contained within the Arrowhead Springs Specific Plan related to hillside development techniques for the Arrowhead Spring area include:

- All permanent manufactured slope banks shall be constructed at a gradient of not greater than 2:1 (horizontal to vertical), unless the Project civil and/or geotechnical engineer can certify slope stability for any cut slope greater than 2:1. Cut slopes shall not exceed 1:1. Exceptions may be made in the case of rock or natural outcroppings.

- Incorporating the recommendations of the Project civil and/or geotechnical engineer, the following standards and specifications for benching and terrace drains on manufactured cut and fill slopes should be used in grading design and implementation:

    - If any slope benches are required by the project civil engineer or geotechnical engineer, then slope benches of six feet in width shall be provided at not more than 40- foot vertical intervals and shall include a drainage swale on all cut or fill slopes to control surface drainage and debris, except that where only one terrace is required, it shall be mid-height.

    - For cut or fill slopes greater than 80 feet and up to 120 feet in vertical height, one terrace at-approximately mid-height shall be 12 feet in width. Terrace widths and spacing for cut and fill slopes greater than 120 feet in height shall be designed by the Project civil and/or geotechnical engineer and approved by the City Engineer.

    - Suitable access shall be provided to permit proper cleaning and maintenance.

    - Subject to the approval of the Project civil and/or geotechnical engineer, manufactured slopes less than 40 feet in vertical height do not require any benching.

    - Grading operations shall not result in substantial damage to, or alteration of, significant permanent natural resource areas, wildlife habitats or native vegetation areas, which are designated by the Master Tentative Subdivision Map to be preserved.

    - To the extent feasible, exposed manufactured slopes per the Grading Ordinance as determined by the City Engineer and the Development Services Director shall be naturalized by the use of natural contour grading to approximate natural slopes. To the extent feasible, exposed slopes in excess of 20 vertical feet shall be rounded at the top and toe. If feasible, exposed manufactured slopes in excess of 30 feet shall undulate with varying slope gradients. Both the top and toe of slopes shall be modulated to affect the slope undulation.

    - Special landscaping techniques using plant material of varying heights and massing shall be used in conjunction with contour grading to create a modulated slope appearance.

    - Existing landforms may be re-contoured, as necessary, to provide a smooth and gradual transition to graded slopes, while, preserving the basic character of the site.

    - Local internal streets as well as collector streets shall be meandered where possible to undulate and minimize slope banks. Split-level streets may be utilized where possible to minimize impacts to the natural terrain.

- It is anticipated that topsoil from graded areas could be stockpiled for reapplication to manufactured slope areas.
- Phasing of grading within each planning area shall provide for the safety and maintenance of other planning areas already developed or under construction and visual mitigation (revegetation) of all manufactured slopes.
- Where possible, phasing shall preclude hauling of earth over residential streets of developed areas. All import and/or export activities of earth material to or from the Arrowhead Springs site shall conform to Sections 15.04-210, 15.04-545, 15.38 of the San Bernardino Municipal Code.
- Temporary runoff/erosion control devices shall be installed prior to any grading activities. Runoff/erosion control and maintenance shall be employed subject to the City of San Bernardino Division of Public Works Grading Policies and Procedures.
- Prior to October 15 of each year, all graded but not permanently landscaped slopes shall be hydro-seeded for slope stabilization as necessary for erosion control, to the satisfaction of the City Engineer. The application for any grading permit must provide assurance to the City Engineer that manufactured slope banks will be properly landscaped and irrigated, and that the landscape will be, maintained by either the developer, the property owner(s) or by a Landscaping Maintenance District.
- A revegetation plan shall be prepared for review and approval by the City Engineer and the Development Services Director for manufactured slopes occurring adjacent to undisturbed native plant communities.
- Hauling of earth or construction materials over residential streets in developed areas shall be avoided. A truck hauling route shall be submitted to the City Engineer for approval prior to commencement of any grading operation. The approved haul routes may require the construction of a greater structural section along haul routes, to the satisfaction of the City Engineer and/or the Director of Public Works.
- Crib and/or retaining walls may be allowed in situations where significant grading can be saved and where approved by the soils engineer and accepted by the City Engineer.
- Any off-site grading shall be reviewed and approved by the City Engineer as part of a grading review package. A letter of permission from the affected property owner(s) shall be required prior to issuance of any grading permit for off-site work. Absent such permission, grading plans shall conform to the required grading setbacks s provided in the City's Grading ordinance.
- Prior to work in any streambed, permits shall be obtained from the California Department of Fish and Game, the U.S. Army Corps of Engineers and the California State Water Quality Control Board.

5.5.4 Existing Regulations and Standard Conditions

5.5.4.1 San Bernardino General Plan Update

The following existing regulations and standard conditions apply to both the San Bernardino General Plan Update and the Arrowhead Springs Specific Plan.

- If a project site is located in an Earthquake Fault Zone (formerly known as "Special Studies Zones"), the City of San Bernardino must withhold development permits for sites within the zones until geologic investigations demonstrate that the sites are not threatened by surface displacement from future faulting as required by the Alquist-Priolo Earthquake Fault Zoning Act. The purpose of this Act is "to regulate development near active faults so as to mitigate the hazard of surface fault rupture." Pursuant to this Act, structures for human occupancy are not allowed within 50 feet of the trace of an active fault.

- The Seismic Hazard Mapping Act was adopted in 1990 for the purpose of protecting public safety from the effects of strong ground-shaking, liquefaction, landslides, or other ground failure caused by earthquakes. Currently, the City of San Bernardino is located outside a mapped area for Seismic Hazard Zones, which establishes regulatory zones that encompass areas prone to liquefaction (failure of water-saturated soil) and earthquake-induced landslides. Once the City of San Bernardino has been mapped pursuant to this Act, the City of San Bernardino must withhold development permits for a site within a designated Seismic Hazard Zone until the geologic conditions are investigated and appropriate mitigation measures, if any, are incorporated into the development plans. In addition, sellers (and their agents) of real property within a mapped Seismic Hazard Zone must disclose that the property lies within such a zone at the time of sale.

- Development in the San Bernardino planning area is required to adhere to the building standards of the most recent California Building Code (CBC) and Uniform Building Code (UBC), which regulates the design and construction of excavations, foundations, building frames, retaining walls, and other building elements to mitigate the effects of seismic shaking and adverse soil conditions. The procedures and limitations for the design of structures are based on site characteristics, occupancy type, configuration, structural system height, and seismic zoning for Seismic Zone 4.

- All development proposals shall be evaluated in compliance with the California Environmental Quality Act (CEQA) and all General Plan environmental policies including, but not limited to, geologic hazards. Structures within 50 feet of an active or potentially active fault shall be prohibited. Development within these areas shall be subject to the submittal of appropriate report(s) prepared by qualified professionals which address the impacts of the proposed project; the identification of mitigation measures necessary to eliminate the significant adverse impacts; and, the provision of a program for monitoring, evaluating the effectiveness of, and insuring the adequacy of the specified mitigation measures. (Article III, Section 19.20.030, Section 6 of the City of San Bernardino Municipal Code)

- All formal grading plans or site drainage plans must be reviewed and approved by the Engineering Section in the Department of Public works. This approval is required before building permits are issued. (Title 15 of the City of San Bernardino Municipal Code)

- In addition to the requirements of Chapter A33 of the Uniform Building Code, the Municipal Code adds or makes provisions to mitigate against potential geological hazards in the City of San Bernardino:

    (1) Provisions for the applicability of the Alquist-Priolo Special Studies Zone. Within designated areas, reports on earthquake or liquefaction hazards are required. (13.04.130)

(2) Requires slopes to be on downhill lots unless specifically waived. (15.04.160)

(3) Redefines setback from top to toe of slope. (15.04.190)

(4) Requires slope planting of cut and fill slopes and review by the City Engineer. Slopes less than 5 feet may be waived under special circumstances. Provides for automatic irrigation on all slopes in excess of 15 feet. (15.04.200)

(5) Provides for review of all grading projects by Environmental Review Committee where existing grade is 15% or greater, or more than 10,000 cubic yards, or material is to be moved.

- The California Code of Regulations, Title 14, Chapter 4 Subchapter 4 Section 1942.1, Unstable Areas, defines unstable areas as areas that contain fumaroles, geysers, hot springs, mud pots, etc. where drilling any wells, including water wells, is prohibited unless the division determines, after a thorough geological investigation, that drilling in an unstable area is feasible.

- The following are policies aimed at protection of geothermal resources and geothermal hazards contained in Section 13.20.360 of the City of San Bernardino Municipal Code.

    - Conserve and protect the geothermal fluids and ground water within and adjacent to the City, in order to enhance reservoir productivity and benefit; prevent wasteful extraction and disposal of geothermal fluids and thermal ground water; prevent geothermal fluid and thermal ground water temperature degradation; maintain stable static levels of geothermal fluids and thermal ground waters; prevent thermal pollution of surface environs and waters; and prevent harmful intermixing of geothermal fluids or thermal ground water with non-thermal ground waters;

    - Increase and disseminate the scientific knowledge of geothermal and ground water resources; and

    - Protect the public health, safety, and welfare from improperly constructed, operated, maintained, or abandoned wells.

5.5.5 Level of Significance Before Mitigation

5.5.5.1 San Bernardino General Plan Update

Upon consideration of policies and implementation of regulatory requirements and standard conditions of approval, the following impacts would be less than significant:

GP Impact 5.5-1 Project residents (or occupants) within the San Bernardino planning area would be susceptible to potential impacts from surface rupture, severe ground-shaking and seismic induced liquefaction. However, new developments within the City would be required to ensure that structures could withstand the impacts from seismic related activity as required by the CBC for seismic related impacts within Seismic Zone 4. Furthermore, no structures are allowed within 50 feet of an active fault trace as required by the Alquist-Priolo Earthquake Fault Zoning Act and the Seismic Hazard Mapping Act.

GP Impact 5.5-2 Portions of the City of San Bernardino and SOI areas are located on unstable geological units or have unstable soil conditions that may result in loss of topsoil or be susceptible to landslides, lateral spreading, liquefaction, subsidence, and

collapse. However, development in the San Bernardino planning area is required to adhere to the building standards of the most recent CBC and UBC, which regulates the design and construction of excavations, foundations, building frames, retaining walls, and other building elements to mitigate the effects of seismic shaking and adverse soil conditions.

GP Impact 5.5-3 Portions of the City of San Bernardino and SOI areas may be located in areas with expansive soil conditions which can result in risks to life or property. However, in addition to adherence to the CBC and UBC, all formal grading plans must be reviewed and approved by the Engineering Section in the Department of Public works, which would ensure that site soil conditions are conducive to development and would not induce or be subject to impacts in this regard.

5.5.5.2 Arrowhead Springs Specific Plan

Upon consideration of development standards and implementation of regulatory requirements and standard conditions of approval, the following impacts would be less than significant:

AHS Impact 5.5-1 Project residents (or occupants) within the Arrowhead Springs Specific Plan area would be susceptible to potential impacts from surface rupture, severe ground-shaking and seismic induced liquefaction. However, new developments within Arrowhead Springs would be required to ensure that structures could withstand the impacts from seismic related activity as required by the CBC for seismic related impacts within Seismic Zone 4. Furthermore, no structures are allowed within 50 feet of an active fault trace as required by the Alquist-Priolo Earthquake Fault Zoning Act and the Seismic Hazard Mapping Act.

AHS Impact 5.5-3 Soil conditions within the Arrowhead Springs Area exhibit very-low expansion potential and therefore do not pose a risk to life or property due to expansive soils conditions.

Without mitigation, the following impacts would be **potentially significant**:

AHS Impact 5.5-2 Portions of the Arrowhead Springs Specific Plan area are located on unstable geological units or have unstable soil conditions that may result in loss of topsoil or be susceptible to landslides, lateral spreading, liquefaction, subsidence, and collapse.

5.5.6 Mitigation Measures

5.5.6.1 San Bernardino General Plan Update

No significant impacts were identified and no mitigation measures are necessary.

5.5.6.2 Arrowhead Springs

AHS 5.5-2a All projects within the Arrowhead Springs Specific Plan area shall follow all geotechnical recommendations provided within the Report of Preliminary Geotechnical Evaluations produced by Soils Southwest Inc.

AHS 5.5-2b Site specific geotechnical analysis shall be required for all new developments within the Arrowhead Springs Specific Plan area to determine existing soils conditions, soil recommendations for fill material prior to grading, and slope stability. Detailed

geologic and geotechnical evaluations shall be made for construction of structural footings and slab-on-grade for placement on compacted fill soils.

AHS 5.5-2c No fill shall be placed, spread or rolled during unfavorable weather conditions. Where work is interrupted by heavy rains, fill operations shall not be resumed until moisture conditions are considered favorable by the soils engineer.

AHS M 5.5-2d Proposed level structural pad areas shall be carefully evaluated by project geologist to determine whether these locations can be rendered safe and stable without potentially affecting offsite improvements. Excavated footings shall be inspected, verified and certified by soils engineer prior to steel and concrete placement to ensure their sufficient embedment and proper bearing. Structural backfill shall be placed under direct observation and testing.

5.5.7 Level of Significance After Mitigation

The mitigation measures identified above would reduce potential impacts associated with geologic hazards to a level that is less than significant. Therefore, no significant unavoidable adverse impacts relating geology and soils have been identified.

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5.6 HAZARDS AND HAZARDOUS MATERIALS

This section of the EIR evaluates the safety hazards in the City of San Bernardino and its Sphere of Influence (SOI), including environmental hazards associated with hazardous waste disposal and emergency preparedness. Background information on safety hazards provides a basis for the siting of land uses that would reduce unreasonable risks and protect public health and welfare. Various Federal and State programs that regulate the use, storage, and transportation of hazardous materials are also discussed in this section.

The analysis in this section is based in part on the following technical report(s):

- *City of San Bernardino General Plan EIR, Chapter 4.4.3 Hazardous Materials/Uses.* City of San Bernardino. 1988.
- City of San Bernardino General Plan Update Technical Background Report, Chapter 5, Hazards, Envicom Corporation, February 1988.
- Phase I Environmental Assessment for Arrowhead Springs, The Planning Center, March 28, 2005

A complete copy of the Phase I Assessment is included in the Technical Appendices to this Draft EIR (Volume III, Appendix E).

5.6.1 Environmental Setting

Regulatory Background

Various Federal and State programs regulate the use, storage, and transportation of hazardous materials. Regulations can be used to reduce or mitigate the danger that hazardous substances may pose to San Bernardino residents, businesses, and visitors, both in normal day-to-day conditions and as a result of a regional disaster, such as an earthquake or major flood. Several of the existing Federal and State programs are summarized in the following paragraphs.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)

The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) is a regulatory or statute law developed to protect the water, air, and land resources from the risks created by past chemical disposal practices. This act is also referred to as the Superfund Act and contains the National Priority List (NPL) of sites, which are referred to as Superfund sites.

Emergency Planning and Community Right-To-Know Act (EPCRA)

The primary purpose of the Federal Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986 is to inform communities and citizens of chemical hazards in their areas. Sections 311 and 312 of EPCRA require businesses to report the locations and quantities of chemicals stored on-site to state and local agencies. These reports help communities prepare to respond to chemical spills and similar emergencies.

The EPA maintains and publishes a database that contains information on toxic chemical releases and other waste management activities that are reported annually by certain industry groups and federal facilities. The database is referred to as the Toxics Release Inventory (TRI), and it was first established under the EPCRA and expanded by the Pollution Prevention Act of 1990. EPCRA has allowed for the mandate that Toxic Release Inventory (TRI) reports be made public. TRI reports provide accurate information about potentially hazardous chemicals and their uses in an attempt to give the community more power to hold companies accountable and to make informed decisions about how such chemicals should be managed.

Section 3131 of EPCRA requires manufacturers to report releases to the environment of more than 600 designated toxic chemicals. These reports are submitted to the EPA and State agencies. The EPA compiles these data into an on-line, publicly available national digital TRI. The facilities are required to report on releases of toxic chemicals to the air, soil, and water. They are also required to report on off-site transfers of waste for treatment or disposal at separate facilities. Pollution prevention measures and activities and chemical recycling must also be reported.

Reporting by facilities is based on the following factors:

- If the facility has 10 or more full-time employees;
- If the facility manufactures or processes over 25,000 pounds of approximately 600 designated chemicals, or 28 chemical categories specified in the regulations, or uses more than 10,000 pounds of any designated chemical or category; and
- Engages in certain manufacturing operation in the industry groups specified in the U.S. Government Standard Industrial Classification Codes (SIC) 20 through 39; or
- If the facility is a Federal facility.

Resources Conservation and Recovery Act (RCRA)

The Resources Conservation and Recovery Act (RCRA) is the principal Federal law that regulates the generation, management and transportation of waste materials. Hazardous waste management includes the treatment, storage, or disposal of hazardous waste. Treatment is defined as any process that changes the physical, chemical, or biological character of the waste to make it less of an environmental threat. Treatment can include neutralizing the waste, recovering energy or material resources from the waste, rendering the waste less hazardous, or making the waste safer to transport, dispose of, or store. Storage is the holding of waste for a temporary period of time. The waste is treated, disposed of, or stored at a different facility at the end of the storage period. Disposal is the permanent placement of the waste into or on the land. Disposal facilities are usually designed to contain the waste permanently and to prevent the release of harmful pollutants to the environment.

San Bernardino County is a member of the Southern California Hazardous Waste Management Authority (SCHWMA), and works on regional level to solve hazardous waste problems. The Hazardous Materials Division (HMD) of the San Bernardino County Fire Department is designated by the State Secretary for Environmental Protection as the Certified Unified Program Agency (CUPA) for the County of San Bernardino in order to focus the management of specific environmental programs at the local government level to address the disposal, handling, processing, storage and treatment of local hazardous materials and waste products.

The United States Environmental Protection Agency (EPA) has defined hazardous waste as substances that may cause or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible illness; that pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of or otherwise managed; and whose characteristics can be measured by a standardized test or reasonably detected by generators of solid waste through their knowledge of their waste. Hazardous waste is also ignitable, corrosive, or explosive. A material may also be classified as hazardous if it contains defined amounts of toxic chemicals. The EPA has developed a list of specific hazardous wastes that are in the forms of solids, semi-solids, liquids, and gases. Producers of such wastes include private businesses, federal, state, and local government agencies.

The California Code of Regulations, Title 22 defines hazardous materials as substances that are toxic, ignitable or flammable, reactive, and/or corrosive. The code also defines an extremely hazardous material as

a substance that shows high acute or chronic toxicity, carcinogenity, bioaccumulative properties, is persistent in the environment, or is water reactive.

Many different types of businesses can be producers of hazardous waste. Small businesses like dry cleaners, auto repair shops, medical facilities or hospitals, photo processing centers, and metal plating shops are usually generators of small quantities of hazardous waste. The EPA defines a small quantity generator as a facility that produces between 100 and 1,000 kilograms (kg) of hazardous waste per month. Since many of these facilities are small, start-up businesses that come and go, the list of small-quantity generators in a particular area changes significantly over time. Often, a facility remains, but the name of the business changes with new ownership.

Generators of large quantities of hazardous waste include chemical manufacturers, large electroplating facilities, and petroleum refineries. A large quantity generator is a facility that produces over 1,000 Kg of hazardous waste per month and is fully regulated under RCRA. EPA lists of hazardous waste generators changes yearly and updated information may be obtained from the San Bernardino County Department of Public Health or the EPA.

Hazardous Materials Disclosure Programs

Both the Federal government (Code of Federal Regulations, EPA, SARA and Title III) and the State of California (California State Health and Safety Code, Division 20, Chapter 6.95, Sections 25500–25520; California Code of Regulations, Title 19, Chapter 2, Sub-Chapter 3, Article 4, Sections 2729-2734) require all businesses that handle more than a specified amount of hazardous materials or extremely hazardous materials, termed a reporting quantity, to submit a Hazardous Materials Business Plan to its local CUPA.

According to the San Bernardino County Fire Department HMD guidelines, the preparation, submittal and implementation of a business plan is required by any business that handles a hazardous material or a mixture containing a hazardous material in quantities equal to, or greater than, those outlined below:

- Any business that uses, generates, processes, produces, treats, stores, emits, or discharges a hazardous material in quantities at or exceeding 55 gallons, 500 pounds, or 200 cubic feet (compressed gas) at any one time in the course of a year.
- All hazardous waste generators, regardless of quantity generated.
- Any business that handles, stores, or uses Category I or II pesticides, as defined by FIFRA, regardless of amount.
- Any business that handles DOT Hazard Class 1 (explosives, found in 49 CFR) regardless of amount,
- Any business that handles extremely hazardous substances (EHSs) in quantities exceeding the "Threshold Planning Quantity" (T.P.Q.). Extremely Hazardous Substances are designated pursuant to the Emergency Planning and Community Right to Know Act Section 302, and are listed in 40 CFR Part 355. See Appendix B of this guide for an alphabetical list of EHSs.
- Any business subject to the Emergency Planning and Community Right to Know Act (EPCRA), also known as SARA Title III. Generally EPCRA includes facilities that handle hazardous substances above 10,000 lbs. or extremely hazardous substances above threshold planning quantities. There are some exceptions, including retail gas stations with up to 75,000 gallons of gasoline or 100,000 gallons of diesel fuel in Underground Storage Tanks (USTs) that meet the 1998 upgrade requirements. To get more information on EPCRA requirements call 1-800-424-9346. Due to State disclosure consolidation laws, Tier II forms need not be submitted to the various State and Federal agencies. Submission of your Business Emergency/ Contingency Plan will meet this requirement.

However, EPCRA does require full annual inventory submission rather than a certification statement each March 1. Also EPCRA facilities are bound by the trade secret limitations of EPCRA and must sign every page of inventory.

- Any business that handles radioactive material that is listed in Appendix B of Chapter 1 of 10 CFR.

Businesses are required to update their business plan to the San Bernardino County Fire Department HMD by March 1 of every year. The entire business plan must be reviewed and re-certified every 3 years. In addition, the plan must be revised within 30 days of change of: owner; business address; business name; emergency contact information, inventory, or other site conditions which may significantly impact emergency response. Any mid-year revision must at minimum include a letter of explanation, the Cover Sheet, the Activities Page, the Business Owner/Operator Identification Page, and any other information that has changed.

Business plans must include an inventory to certify the hazardous materials at the facility. If no changes have been made to an inventory, a written certification will suffice for an update. However, if changes have been made, those changes must be submitted to the San Bernardino County Fire Department HMD. Businesses are required to review their business plan at least once every three years to determine if a revision is necessary. They must certify in writing to the San Bernardino County Fire Department HMD that a review was conducted and all necessary changes were made. A copy of all changes must be submitted as part of the certification. Also, business plans are required to include emergency response plans and procedures to be used in the event of a significant or threatened significant release of a hazardous material. These plans also need to identify the procedures to follow for immediate notification to all appropriate agencies and personnel of a release, identification of local emergency medical assistance appropriate for potential accident scenarios, contact information for all company emergency coordinators of the business, a listing and location of emergency equipment at the business, an evacuation plan, and a training program for business personnel.

Business plans are to be used by responding agencies, such as the San Bernardino County Fire Department HMD, during a release to allow for a quick and accurate evaluation of each situation for appropriate response. The San Bernardino County Fire Department HMD currently reviews submitted business plans and updates. Businesses that handle hazardous materials are required by law to provide an immediate verbal report of any release or threatened release of hazardous materials if there is a reasonable belief that the release or threatened release poses a significant present or potential hazard to human health and safety, property or the environment. Any business that violates any provision of the Business Emergency Plan shall be civilly liable in an amount of not more than two thousand dollars ($2,000) for each day of the violation. Any business that knowingly and willfully violates any provision of the Business Emergency Plan shall be civilly liable in an amount not to exceed five thousand dollars ($5,000) for each day of the violation. Any person who willfully prevents, interferes with, or attempts to impede the enforcement of this chapter by any authorized representative of an Administering Agency is, upon conviction, guilty of a misdemeanor (CHSC, Section 25515.1). If the violation results in, or significantly contributes to an emergency, including a fire to which the county and/or city is required to respond, the person(s) shall also be assessed the full cost of the county and/or city emergency response as well as the cost of clean up and disposal.

The San Bernardino County Fire Department HMD is charged with the responsibility of conducting compliance inspections of regulated facilities in San Bernardino County. Regulated facilities are those that handle hazardous materials, generate or treat a hazardous waste and/or operate an underground storage tank. Specialists are assigned countywide to address the wide variety of complex issues associated with hazardous substances. All new installations of underground storage tanks require an inspection, along with the removal, under strict chain-of-custody protocol, of the old tanks.

Hazardous Materials Incident Response

Thousands of different chemicals are available today, each with unique physical characteristics. What might be an acceptable mitigation practice for one chemical could be inadequate for another. Therefore, it is essential that agencies responding to a hazardous material release have as much available information as possible regarding the type of chemical released, the amount released, and its physical properties to effectively and quickly evaluate and contain the release. The EPA-required business plans are an excellent resource for this type of information. Other sources of information are knowledgeable facility employees who are present onsite.

In 1986, Congress passed the Superfund Amendments and Reauthorization Act (SARA). Title III of this legislation requires that each community establish a Local Emergency Planning Committee (LEPC) that is responsible for developing an emergency plan for preparing for and responding to chemical emergencies in that community.

This emergency plan must include the following:

- An identification of local facilities and transportation routes where hazardous material are present.
- The procedures for immediate response in case of an accident (this must include a community-wide evacuation plan).
- A plan for notifying the community that an incident has occurred.
- The names of response coordinators at local facilities.
- A plan for conducting exercises to test the plan.

The plan is reviewed by the State Emergency Response Commission (SERC) and publicized throughout the community. The LEPC is required to review, test, and update the plan each year.

The San Bernardino County Fire Department HMD is responsible for coordinating hazardous material and disaster preparedness planning and appropriate response efforts with city departments, as well as local and state agencies. The goal is to improve public and private sector readiness, and to mitigate local impacts resulting from natural or man-made emergencies. The Office of Emergency Services is a branch of the San Bernardino County Fire Department that deals with the planning for and response to the natural and techno-logical disasters in the City of San Bernardino, while the Hazardous Materials Division of the San Bernardino County Fire Department deals with the hazardous materials coordination and inspection in the City.

Hazardous Material Spill/Release Notification Guidance

All significant spills, releases, or threatened releases of hazardous materials must be immediately reported. Federal and State emergency notification is required for all significant releases of hazardous materials (e.g., location, date and time of spill, release or threatened release, substance and quantity involved, time and duration of the release). Requirements for immediate notification of all significant spills or threatened releases cover: Owners, Operators, Persons in Charge, and Employers. Notification is required regarding significant releases from facilities, vehicles, vessels, pipelines and railroads. Many State statutes require emergency notification of a hazardous chemical release. These statutes include:

- Health and Safety Codes §25270.7, 25270.8, and 25507.
- Vehicle Code §23112.5.
- Public Utilities Code §7673, (PUC General Orders #22-B, 161).
- Government Code §51018, 8670.25.5 (a).
- Water Codes §13271, 13272.
- California Labor Code §6409.1 (b)10.

In addition, all releases that result in injuries, or workers harmfully exposed, must be immediately reported to California Occupational Safety and Health Administration (Cal/OSHA) (California Labor Code §6409.1 (b)). For additional reporting requirements, also refer to the Safe Drinking Water and Toxic Enforcement Act of 1986, better known as Proposition 65, and §9030 of the California Labor Code.

The California Accidental Release Prevention Program (CalARP) became effective on January 1, 1997 in response to Senate Bill 1889. The CalARP replaced the California Risk Management and Prevention Program (RMPP). Under the CalARP, the Governor's Office of Emergency Services (OES) must adopt implementing regulations and seek delegation of the program from the EPA. The CalARP aims to be proactive and therefore requires businesses to prepare Risk Management Plans (RMPs), which are detailed engineering analyses of the potential accident factors present at a business, and the mitigation measures that can be implemented to reduce this accident potential. In most cases, local governments will have the lead role for working directly with businesses in this program. The County of San Bernardino Fire Department is designated as the Administering Agency for hazardous materials for the City of San Bernardino.

5.6.1.1 San Bernardino General Plan Update

Hazardous Waste Collection Centers

In the City of San Bernardino, there are approved hazardous waste management companies which offer managing services to other companies for the treatment, disposal or storage of hazardous material. These companies have either received a permit or have been granted interim status by the Sate of California pending review of the facilities for compliance with federal and state regulations. According to the California Department of Toxic Substances Control, there are no commercial hazardous waste permitted Recycling, Treatment, Storage and Disposal Facilities (TSDF) that accept offsite waste and perform treatment and/or disposal in the City of San Bernardino.

In San Bernardino, household hazardous waste such as used motor oil, paints is collected at the San Bernardino Collection Center located at 2824 East W., Street in San Bernardino.

The San Bernardino County provides specific locations to take all CRT's (cathode ray tube) from televisions, and computer monitors, or any other electronic equipment to insure proper disposal of such harmful waste for local community residents. Table 5.6-1 lists the CRT recyclers located within the County.

Table 5.6-1
Cathode Ray Tube Materials Recyclers in San Bernardino County

Company	*Location*	*Distance from the City (Miles)*
A-1 Recycling	10651 "E" Avenue, Hesperia	38
American Metal Recycling	11150 Redwood Avenue, Fontana	18
Earth Protection Services, Inc.	2821 East Philadelphia Avenue, Ontario	26
Extreme Dream	15180 Euclid Avenue, Chino	33
Filter Recycling Services	180 West Monte Avenue, Rialto	11
Lighting Resources, Inc.	805 East Francis Street, Ontario	29
San Bernardino County Waste Management	Corp Yard South Lot, 900 South, Barstow	67
Town of Apple Valley	22411 Highway 18, Apple Valley	47
TrueCycle	14749 Hesperia Road, Victorville	38
West Valley MRF, LLC	13373 Napa Street, Fontana	20

Source: Department of Toxic Substances Control. Managing Hazardous Waste. CRT Materials Recyclers in San Bernardino County. Obtained March 2005 from http://www.dtsc.ca.gov/database/CRT_Recyclers/county_list.cfm

Hazardous Waste Transporters

The U.S. Department of Transportation (DOT) regulations govern all means of transportation, except for those packages shipped by mail, which are covered by US Postal Service regulations. Under the Resource Conservation and Recovery Act of 1976 (RCRA), the U.S. Environmental Protection Agency (EPA) sets standards for transporters of hazardous waste and the State of California regulates the transportation of hazardous waste in California originating in the state and passing through the state. Also, all hazardous waste transporters must be registered with the state Department of Toxic Substances Control (DTSC) and meet operating requirements. Senate Bill 489 of 2002 requires that transporters and facilities who handle HWC to submit Disclosure Statements with fingerprints to DTSC for review and to immediately report of missing hazardous wastes of concern. Additionally, the California Highway Patrol and the California Department of Transportation have primary responsibility for enforcing federal and state regulations and responding to hazardous materials transportation emergencies. Table 5.6-2, below is a list of registered hazardous material transporter in the planning area, registered in 2005.

Table 5.6-2
Hazardous Waste Transporters in the City of San Bernardino Registered within the DTSC

Company	Location
Golden State Environmental Services Inc.	1497 South Gage Street
ECTI	953 West Reece Street
Brickley Environmental	957 West Reece Street
San Bernardino County Fire Department	2824 East "W" Street
Burlington Northern & Santa Fe Railway Co.	740 East Carnegie Drive
San Bernardino City Unified School District	956 West 9th Street
Haz Mat Trans, Inc.	230 East Dumas Street

Source: Department of Toxic Substances Control. Registered Hazardous Waste Transporter Database. Obtained March 2005 from http://www.dtsc.ca.gov/HazardousWaste/TRANSRCH02.CFM

Hazardous Materials Incidence Response Along Transportation Routes

Three major interstates—-I-215, I-210, and I-10—cross the San Bernardino planning area. Interstate 215 traverses north-south through the western portion of the City, Interstate 210 transverses east-west through the north-central portion of the City, and Interstate 10 transverses east-west through the southernmost portion of the City. In addition to these major interstates, State Route 330 transverse north-south through the northeastern portion of the City and State Route 18 begins at the northern tip of San Bernardino. Major rail lines of the Burlington Northern Santa Fe Rail (BNSF) lines also travel through the City. Both the interstate roadways and the railroad lines are used to transport hazardous materials, posing a potential for spills or leaks from non-stationary sources to occur within the area. Trucks and trains carrying hazardous materials are required to have placards that indicate at a glance the chemicals being carried, and whether or not they are corrosive, flammable or explosive. Train conductors are required to carry detailed "material data sheets" for each of the substances on board. These documents are designed to help emergency response personnel assess the situation immediately upon arrival at the scene of an accident, and take the appropriate precautionary and mitigation measures. The California Highway Patrol is in charge of spills that occur in or along freeways, with the California Department of Transportation, and local sheriffs and fire departments responsible for providing additional enforcement and routing assistance.

While train derailment can occur at anytime, it is during an earthquake that a derailment and hazardous materials release would result in the greatest impact. According to the California Public Utilities Commission

(1994), it is standard operating procedure to stop all trains within one hundred miles of the epicenter of a magnitude 6.0 or greater earthquake.

Hazardous Materials Release as a Result of an Earthquake

Earthquakes have the potential to cause the accidental release of hazardous materials. It is much more difficult to manage a hazardous materials spill in the aftermath of an earthquake than under non-earthquake conditions. Hazardous material response teams responding to a release as a result of an earthquake have to deal with potential structural and non-structural problems of the buildings housing the hazardous materials, potential leaks of natural gas from ruptured pipes, and/or downed electrical lines or equipment that could create sparks and cause a fire. When two hazards with potentially high negative consequences intersect, the challenges of managing each are greatly increased. During an earthquake response, hazardous material emergencies become an additional threat that must be integrated into the response management system.

Superfund, Hazardous Waste, and Toxic Release Inventory Sites

Superfund is a program administered by the EPA to locate, investigate, and clean up the worst hazardous waste sites throughout the United States. The Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) list maintained by the EPA contains information on hazardous waste sites, potential hazardous waste sites, and remedial activities across the nation Table 5.6-3 lists sites within the City of San Bernardino on the CERCLIS list. The database includes sites that are on the National Priorities List (NPL) or being considered for the NPL. Two sites within or near to the City of San Bernardino are located on the NPL List and are designated Superfund Sites: the Norton Air Force Base and the Newmark Groundwater Contamination site.

Table 5.6-3
CERCLIS Sites in the City of San Bernardino

Company	*Location*
Hanford Foundry Company	119 South Arrowhead
Camp Ono	215 North of University Parkway and Cajon Boulevard
Flintkote Asbestos	San Bernardino* (Site location not identified)
Lawrence E McConnehey/ Trojan Plating, Inc.	268 & 236 South Mountain View Avenue
Phil's Charbroil Burgers	835 East 3rd Street
Quality Plating Inc.	456 South "I" Street
Southwest Metal Co.	740 Congress Street
On the NPL	
Newmark Groundwater Contamination Site	Bunker Hill Groundwater Basin
U.S. Air Force – Norton	305 South Tippecanoe Avenue

Source: Environmental Protection Agency. Superfund (CERCLIS) Database. Obtained March 2005 from http://www.epa.gov/enviro/html/cerclis/cerclis_query.html

Landfills

The City of San Bernardino has no active landfills. However, the County of San Bernardino Department of Public Works Waste Management Division operates the San Timoteo Landfill in the City of Redlands, to the southeast of the City and the Mid-Valley Sanitary Landfill to the west of the City. The San Timoteo landfill accepts 1,000 tons per day and has an estimated capacity of 14,800,000 cubic yards. The Mid-Valley Sanitary Landfill is located in the City of Rialto. The Mid-Valley Sanitary Landfill accepts 7,500 tons per day of

solid waste and has an estimated capacity of 62,000,000 cubic yards[1] (see Section 5.15 for discussion of solid waste impacts).

Norton Air Force Base

According to EPA data, the former Norton Air Force Base (AFB) is a designated superfund site located within the eastern portion of the City of San Bernardino. The 2,165-acre Norton Air Force Base site began operations in 1942 and served as a major overhaul center for jet engines and the general repair of aircraft. The site had the responsibility of providing maintenance and logistics for liquid-fuel intercontinental ballistic missiles. In 1987, the EPA added this site to the NPL noting soil contaminants that include polychlorinated biphenyls (PCB), trichloroethylene (TCE), petroleum hydrocarbons, lead and other toxic metals, and polycyclic aromatic hydrocarbons. Norton AFB was closed in 1994 under the Base Realignment and Closure Act.

Past hazardous waste management practices may have contributed to existing contamination problems throughout the base. The practices include burial of drums and other unspecified materials; disposal of waste oils, solvents, and paint residues into landfills, unlined pits, ponds, and drying beds; storage in leaking underground tanks; and spills of AVGAS, oils, solvents, PCBs, and acidic plating solutions. Industrial solvents have been used extensively on the base. Unknown quantities of spent solvents were disposed of in several base landfills.

The Norton AFB plume stretches 2½ miles long and contaminates 100,000 acre-feet of groundwater. Groundwater contamination has affected several municipal drinking water wells. November 1986, the California Regional Water Quality Control Board issued a Cleanup and Abatement Order requiring Norton AFB to clean up one on-base area, the Industrial Waste Water Treatment Plant Sludge Drying Beds. Phase II-Stage 2 of the IRP was completed in December 1986. More than 22 areas have been identified to date. Additional areas will be studied in Stage 3. Within the boundaries of this Federal facility, there are areas subject to the Subtitle C corrective action authorities of the Resource Conservation and Recovery Act (RCRA). The Air Force continues to operate a groundwater pump and treatment system and 17 of the 22 contaminated sites at the facility have become non-hazardous.

A Draft Action Memorandum released in August of 2003 calls for Installation Restoration Program (IRP) on Sites 10 to 12 to remove contaminated soil at the former Norton AFB. The cleanup was scheduled to being in late 2003 to remove dioxin contaminated soil at IRP Site 10 that is on the south side of the Palm Meadows Golf Course along the Santa Ana River wash and remove metal-contaminated soil at Site 12, on the east end of the golf course. The Action Memorandum explains that approximately 19,000 cubic yards of soil, impacting approximately 6 acres, will be removed and disposed of off-site at an approved facility.

Surface and Subsurface Groundwater Contamination

The San Bernardino Bunker Hill Sub-basin in the Upper Santa Ana Valley Groundwater Basin, which is bounded by the San Gabriel Mountains to the north and the San Bernardino Mountains to the east, shows contamination from TCE and PCE above acceptable California State Action levels of five parts per billion (ppb) for TCE and four ppb for tetrachloroethylene (PCE) (also known as perchloroethylene or PERC). Nitrates have also been identified at the site in concentrations above State action levels for nitrates of 45 parts per million (ppm).

[1] California Integrated Waste Management Board. *Active Landfills Profile for San Timoteo Sanitary Landfill (36-AA-0087)*. Capacity information. 2000.

Groundwater Contamination Clean-Up Sites (Cortese List)

The Cortese list database identifies hazardous waste sites selected for remedial action and UST properties having a reportable release and is maintained by the EPA/Office of Emergency Information. According to the California Department of Toxic Substances Control-Site Clean-Up there are two sites in the planning area for remedial clean up on the Cortese list: the former Norton Air Force Base is a 2,208 acres site southeast of the planning area and the Newmark Groundwater Contamination site in the northern portion of the Bunker Hill Ground Water Basin[2].

Newmark Groundwater Contamination

The Newmark Groundwater Contamination site underlies portion of the planning area with two groundwater plumes on either side of Shandin Hills. Newmark Plume area stretches to 5 miles on the east side of Shandin Hills and on the west side lies the Muscoy Plume area, extending for 4 miles north. Contaminants found in these plumes include chlorinated solvents, PCE and TCE, resulting in the closing of 20 water supply wells within a 6-mile radius. The Newmark Groundwater Contamination Site was listed on the NPL in 1989. The City Municipal Water Department under contract to the U.S. EPA, brought 12 of the wells back into operation by installing air stripping towers on eight wells and carbon filtration systems on the other four.

For the Newmark Plume Area, a remedy was chosen in 1993 to pump and treat about 18 million gallons of contaminated water per day. This would prevent additional contaminants from entering this part of the valley. The Muscoy Plume Area was dividend into two projects: the Muscoy Plume that would control the spread of contamination into clean area, and the Source Project that would address final cleanup of the source of contamination. The water from both plumes would be treated by conventional activated carbon adsorption technology to meet all drinking water standards. The treated water will be delivered to the local municipal water departments, which will bear the majority of the operating costs. While no immediate actions were required at the Newmark Groundwater Contamination site, the San Bernardino Municipal Water Department has constructed and operated four wellhead treatment systems to ensure the safety of the public water supply.

Underground Storage Tanks

Federal laws and regulations relating to underground storage tanks used to store hazardous materials (including petroleum products) require that underground storage tank owners and operators register their tanks with EPA or delegated agencies. Federal regulations also require extensive remodeling and upgrading of underground storage tanks, including installation of leak detections systems. Tank removal and testing procedures are also specified.

State laws relating to underground storage tanks include permitting, monitoring, closure, and cleanup requirements. Regulations set forth construction and monitoring standards, monitoring standards for existing tanks, release reporting requirements, and closure requirements. Old tanks must eventually be replaced. All new tanks must be double-walled, with an interstitial monitoring device to detect leaks. All soil and groundwater contamination must be cleaned up. The Hazardous Materials Division of the San Bernardino County Fire Department is the local agency designated to permit and inspect underground storage tanks and to implement related regulations (Section 103.3.1.1 of the California Fire Code). This would ensure that hazardous substances stored in underground tanks are not released into groundwater and/or the environment. Specialists inspect underground storage tanks (USTs), monitoring equipment, and inventory records of UST systems to ensure that the systems comply with applicable laws and regulations.

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[2] Department of Toxic Substances Control. *DTSC's Hazardous Waste and Substances Site List (Cortese List), San Bernardino County.* Obtained March 2005 from http://www.dtsc.ca.gov/database/Calsites/Cortese_List.cfm?county=36

Table 5.6-4 lists facilities in the City of San Bernardino that have underground storage tanks.

Table 5.6-4
Facilities with Underground Storage Tanks in San Bernardino

Company	Location	Company	Location
Food N Fuel #28*	3404 Del Rosa Avenue	Omnitrans Para Transit	234 S. "I" Street
Mobil Oil 18-HQ 1*	2742 Del Rosa Avenue	San Shell*	907 W. Mill Street
Del Rosa Shell Service*	2886 Del Rosa Avenue	Southern California Gas Co. 007183*	155 S. "G" Street
Tosco SS #30806-5128*	2735 Del Rosa Avenue	ARCO	2696 Foothill Boulevard
Circle K #5239	2734 Del Rosa Avenue	UNOCAL 76	799 W. Baseline Street
Victoria Guernsey #1	133 E. 40th St	K&S Enterprise*	296 E. Baseline Street
Saint Bernardino Medical Center	2101 N. Waterman Avenue	Lanndo, Larry*	147 E. Baseline Street
Merit Oil Co.	2601 Del Rosa Avenue	Food N Fuel*	1055 N. Waterman Avenue
Verizon San Bernardino	1796 N. "I" Street	Merit Oil Co.	1405 W. Rialto Avenue
Highland Shell*	1108 W. Highland Avenue	Circle K #5249	105 S. Pepper Avenue
ARCO Facility #9698*	995 W. Highland Avenue	Roesch Lines, Inc	844 E. 9th Street
Smog Pros/ARCO #5049*	189 W. Highland Avenue	G&M Oil Co., Inc #67*	187 N. "F" Street
Verizon/Marshall Co.	3116 N. "E" Street	East Valley Water District	1155 Del Rosa Avenue
Tosco SS #5193*	3003 N. "E" Street	A C Byers Trucking	767 W. Congress Street
Choice Automotive	1292 N. "H" Street	ARCO Petroleum #6227	702 W. 2nd Street
Circle K #5240	3008 N. "E" Street	ARCO Petroleum #5266*	794 W. Baseline Street
ARCO #9254	3296 N. "E" Street	ARCO Petroleum #5082*	605 N. "H" Street
Auto Lab & Fuel*	847 W. Highland Avenue	Verizon/San Bernardino	665 N. "E" Street
Verizon/Muscoy Co.*	3388 Cajon Boulevard	HIEP THANH Market	337 E. 9th Street
Cal Mat Co	2400 W. Highland Avenue	J. Hubbs & Sons/7th St. Dump	West end of 7th Street
ARCO Facility #9524	2087 W. Highland Avenue	4th St. Rock Crusher*	1945 W. 4th Street
McLane Southern California Inc	4472 Georgia Boulevard	Community Hospital/ San Bernardino	1805 Medical Center Drive
Payless Gasoline*	795 W. 40th Street	C-Star Service Station	1545 W. 5th Street
Devore Mini Mart	1670 Devore Road	SC-San Bernardino City USD	956 W. 9th Street
Fitch, Elan	3199 North State Street	State of California Highway Patrol	2211 Western Avenue
Met Gasoline Service*	1030 Kendall Drive	R.H. Ballard Rehab Hospital	1760 W. 16th Street
Seven-11 #2131-26934	3211 Kendall Drive	Arrowhead SP CH/Conference Center	24600 Arrowhead Springs Road
University Shell	3909 Hallmark Parkway	United Oil #36*	235 E. Baseline Street
Econo Lube N Tube	1685 Kendall Drive	CO-Vehicle Service	210 N. Lena Road
MJ's Market	2795 N. Macy Street	CO-San Bernardino/Gilbert St. Office	670 E. Gilbert
North End AM-PM	5985 Palm Avenue	Mobile	3225 Little League Drive
SC-Child Nutrition Center	1257 Northpark Boulevard	SAAB's Ultramart	1933 W. Highland Avenue
Jack's Disposal Service, Inc.	5455 Industrial Avenue	Charter Leasing Co.	265 W. Mill Street
ARCO AM-PM #81430	1677 Devore Road	Bonadiman McCain, Inc.	280 S. Lena Road
ELCO Contractors	1995 Nolan Street	Armored Transport of California*	372 S. Arrowhead Road
ARCO AM-PM #5887	3890 University Parkway	City Water Reclamation Facility	399 Chandler Place
G&M #76	4095 University Parkway	Waterman Shell*	1930 S. Waterman Avenue
City of San Bernardino Central Garage	4294 University Parkway	TOSCO SS #30776-4975*	1950 S. Waterman Avenue
Econo Lube & Tube #65*	182 S. Sierra Way	Food N Fuel #24*	2649 S. Waterman Avenue

Table 5.6-4
Facilities with Underground Storage Tanks in San Bernardino

Company	Location	Company	Location
Ford Wholesale Co.	222S E. Club Center Drive	ARCO Facility #9715*	1945 S. Tippecanoe Avenue
Orange Show Service Center	1470 S. Tippecanoe Avenue	Mountainview Power CO LLC*	25770 San Bernardino Avenue
Circle K #8641*	520 W. Orange Show Road	ARCO #5214*	305 E. Redlands Avenue
San Bern. Fire Station #11	295 S. Waterman Avenue	Waxie's Enterprises Inc.	1707 Riverview Drive
Wonder Bread/Hostess Cake	450 E. Vanderbilt Way	Harber Companies Inc.	1880 Riverview Drive
State California Highway Patrol	125 W. Mill Street	Orange Shell*	505 W. Orange Show Road
City Water Department/EST Lift	847 E. Brier Drive	G & M Oil Co, Inc. #47*	501 Inland Center Drive
Verizon Norton Co.	1302 S. "E" Street	ARCO Petroleum #5267*	495 S. Waterman Avenue
Costco	1505 E. Enterprise Drive	AT&T Toll Building	455 W. 2nd Street
M&M Automotive	1099 E. Hospitality Lane	City Water Department Yard*	195 N. "D" Street
State Consolidated Offices Building	464 W. 4th Street	ARCO Facility #9696*	247 E. 40th Street
Chevron	4304 Highland Avenue	Waterman Ultramart	2908 N. Waterman Avenue
Wildwood Shell*	295 E. 40th Street		

Source: California State Water Quality Control Board. Underground Storage Tank Program., Geotracker. March 29, 2005 Obtained from http://www.geotracker.swrcb.ca.gov/data/ Note: This data is undergoing data cleanup and may contain errors.
*Also listed on inventory of leaking underground fuel tanks but name of owner may have changed (see below).

Leaking Underground Storage Tanks (LUSTs)

Leaking underground storage tanks (LUSTs) have been recognized since the early 1980s as the primary cause of groundwater contamination by gasoline compounds and solvents. In California, regulations aimed at protecting against UST leaks have been in place since 1983, one year before the Federal RCRA was amended to add Subtitle I requiring UST systems to be installed in accordance with standards that address the prevention of future leaks. The Federal regulations are found in the Code of Federal Regulations, parts 280-281. The State law and regulations are found in the California Health and Safety Code, Division 20, Chapter 6.7, and in the California Code of Regulations Title 23, Division 3, Chapter 16, commonly referred to as the "Underground Tank Regulations." Federal and state programs include leak reporting and investigation regulations, and standards for clean up and remediation. UST cleanup programs are available to fund the remediation of contaminated soil and ground water caused by leaking tanks. California's program is more stringent than the Federal program, requiring that all tanks be double walled, and prohibiting gasoline delivery to non-compliant tanks. The State Water Resources Control Board (SWRCB) has been designated the lead regulatory agency in the development of UST regulations and policy.

Older tanks are typically single-walled steel tanks. Many of these have leaked as a result of corrosion and detached fittings. As a result, the State of California required the replacement of older tanks with new double-walled, fiberglass tanks with flexible connections and monitoring systems. UST owners were given a ten-year period to comply with the new requirements, and the deadline came due on December 22, 1998. However, many UST owners did not act by the deadline, so the State granted an extension for the Replacement of Underground Storage Tanks (RUST) program to January 1, 2002. To enforce these requirements after this program ended in 2002, the State Water Resource Control Board (WRCB) implemented "Red Tag" regulations, effective June 12, 2004, which resulted in changes to Title 23 of the California Code of Regulations. The Red Tag regulations created by the State WRCB define significant violations of USTs and violations that are an imminent threat to health or safety of the environment. To implement this program the State WRCB created the UST Enforcement Unit to support both the leak prevention and cleanup side of the UST program by investigation fraud and violations of UST laws and regulations. Local agencies, such as the local RWQCB, have enforcement authority to red tag USTs if they fail to correct the violation within 7

business days. Underground storage tanks that are red tagged are prevented from being filled with petroleum.

Leaking Underground Fuel Tanks (LUFTs)

The California Regional Water Quality Control Board (CRWQCB), in cooperation with the Office of Emergency Services (OES), maintains an inventory of leaking underground fuel tanks (LUFTs) in a statewide database. Table 5.6-5 lists facilities within the City of San Bernardino which have leaking underground fuel tanks.

Table 5.6-5
Facilities with Leaking Underground Fuel Tanks(LUFTs) in San Bernardino

Name	Location	Name	Location
Ranger Unit Headquarters	3800 Sierra Way	Vista Manufacturing Company	1087 9th Street
U.S. Post Office	1341"E" Street	Chevron	3197 "E" Street
Mobil #18-ELG	296 Baseline Street	7-UP Bottling Company	1400 "H" Street
San Bernardino Pipe and Supply	939 Inland Center Drive	Unocal #0404	487 Highland Avenue
Future Police State	700 "D" Street	Thrifty Oil #326	1208 Mount Vernon Avenue
Von Steenwyk Property	1008 Highland Avenue	Unocal #6968	187 "F" Street
Shell Service Station	505 Orange Show Road	Norton AFB Bldg 762	Leland Norton Way (7th)
Allen Property	895 2nd Street	Inco Service Station	796 5th Street
U-Haul Center of Central City	110 "D" Street	Norton AFB Bldg. 749	Paul Villasenor Boulevard
Shell #10359	10359 Tippecanoe Avenue	Curran Rubbish Disposal	549 San Jacinto Street
Mobil #18-ARM	807 Mill Street	Equilon/Enterprises Shell	1973 Tippecanoe Boulevard
Norton AFB Bldg 736	George Webster Drive ("B" St)	EXXON Service Station #3506	1998 Highland Avenue
Gas Station (Former Muffler Shop)	108 3rd Street	Norton AFB Bldg. 226	106th Street
Iskandar Texaco	24914 5th Street	Industrial Asphalt	2340 Highland Avenue
Alta Dena Dairy	341 Mount Vernon Avenue	California Department of Transportation Garage	247 3rd Street
TFI Appliance Service	941 Inland Center Drive	Viking Tire	747 Rialto Avenue
Firestone Store (BFS #180513)	677 W. 4th Street	Fargo Station	255 5th Street
One Day Paint & Body	288 "E" Street	ARCO #6365 - AM/PM Minimart	2898 Rialto Avenue
Caltrans Panorama Pt..Maint. St.	Hwy 18, Milepost 15.84	San Bernardino Company Vehicle Service	825 3rd Street
Merit Oil Co.	1405 Rialto Avenue	Gallagher Beauty & Barber Supply	190 Arrowhead Avenue
Charter Leasing	265 Mill Street	Omnitrans	1700 5th Street
Support Services Building	1333 Tippecanoe Avenue	Norton AFB Bldg. 647	Location #15
Circle K	2505 Waterman Avenue	California Highway Patrol	2211 Western Avenue
San Bernardino Car Wash	2266 Sierra Way	Norton AFB Bldg. 228	"W" Street
Orbit Stations, Inc	908 Tippecanoe Avenue	Norton AFB Bldg. 300	"U" Street
Chuby Chassis	275 "G" Street	Atchison, Topeka & Sate Fe Railway	1170 3rd Street
General Services Agency	777 Rialto Avenue	Shepardson Property	328 Mountain View Avenue
Valley Gas/ Auto Repair	1195 Waterman Avenue	ARCO	2696 Foothill Boulevard
Buy Rite Gas	906 Waterman Avenue	Camp Essex (J09CA027800)	—
Conoco (Kayo Oil/Econo)	1169 2nd Street	Matlock Transportation	550 Caroline Street
ARCO #5181	572 Mount Vernon Avenue	Levitz Furniture	736 Inland Center Drive
Mobil #18-ELG	296 Baseline Street	B&O Towing	2101 Highland Avenue

Table 5.6-5
Facilities with Leaking Underground Fuel Tanks(LUFTs) in San Bernardino

Name	Location	Name	Location
S. B. County Medical Center	780 Gilbert Street	Norton AFB Bldg 726	East Street
Unocal #3444	25716 Baseline Street	Kam Shell	799 Baseline Street
Norton AFB Bldg. 468	Harry Sheppard Boulevard	Pauley Petroleum	898 Sierra Way
Norton AFB (S-290 TANK)	S-290 Tank (IRP Site 15)	Glen Helen Regional Park	2555 Glen Helen Parkway
Unocal #2281	300 3rd Street	Interstate Brands	1111 9th Street
Norton AFB Bldg. 248	106th Street	Pronto Marketing #316	1198 Highland Avenue
Shell #1108	1108 Highland Avenue	Seccombe Lake Park	7th Street
Norton AFB Bldg. 427	Enterprise (D Street)	La Mancha (Former Mobil SS)	415 5th Street
Farmdale Creamery, Inc.	1049 Baseline Street	Unocal #1842	301 Baseline Street
S & G Roofing Supply, Inc.	1444 Tippecanoe Avenue	Mobil #18-F1W	100 Highland Avenue
Fame Liquors	108 Baseline Street	Super Cal Express	958 Rialto Avenue
Five Star Liquor and Market	306 Mount Vernon Avenue	Truck O'Mat	1955 Hunts Lane
American National Can Co.	5715 Industrial Parkway	Inland Beverage Company	223 "G" Street
Goodyear Tire Co.	774 "E" Street	Thrifty Oil #325/ARCO #9697	2187 Highland Avenue
E-Z Service	798 Highland Avenue	Norton AFB Bldg. 675	Leland Norton Way (7th)
S & G Dairy	542 Marshall Boulevard	Texaco Service Station	797 2nd Street
Fairco, Inc.	915 Scenic Drive	C S U S B Physical Plant	5500 University Parkway
Circle K #335	24901 5th Street	Chevron	598 "H" Street
Norton AFB Bldg. 100	Perimeter Drive	Jack's Disposal Service	380 Oak Street
Roesh Lines, Inc.	844 9th Street	Norton AFB Bldg. 650	"D" Street
Gas Plus	1266 "E" Street	Norton AFB Bldg. 695	West Parking Ramp
Norton AFB Bldg. 333	East Parking Ramp	Del Rosa Work Center	4121 Quail Canyon Road
Holiday Oldsmobile	1388 "E" Street	Norton AFB Bldg. 754	7th Street
Waterman Shell Station	1930 Waterman Avenue	Salvation Army	925 10th Street
Archer JC LLC (Abandoned)	208 Waterman Avenue	White Rose Dairy	697 Waterman Avenue
Norton A\F B Bldg .620	"D" Street	HMC Development	1375 Baseline Road
Nevada Investment Holdings (Alameda Management #512)	499 Orange Show Road	Sirion Printing Ink Co.	730 Lugo Avenue
La Mancha Development	415 5th Street	Joey's Body Shop	916 6th Street
Norton AFB Bldg. 289	"Y" Street	San Bern. Fire Station #3	2121 Medical Center Drive
Frank's Fence	1145 Waterman Avenue	ARCO #5297	1999 Baseline Street
Norton AFB Bldg. 645	"D" Street	U HAUL of San Bernardino	110 "D" Street
ARCO #6227	702 2nd Street	Norton AFB Bldg. 142	2nd Place
Norton AFB Bldg. S-21	Memorial (2nd Street)	Chevron #9-9125	198 "E" Street
Norton AFB Bldg. 169	2nd Place	Rialto Gas Station	1991 "A" Street
Retail Delivery Systems (Cornell Carthage)	737 College Drive	McClane Co.	4472 Georgia Boulevard
Morrison Hope, Inc.	205 Arrowhead Avenue	Smooth Move	207 Walkinshaw Street
San Bern. Fire Station #10	502 Arrowhead Avenue	Sparkle Car Wash	276 Highland Ave
Glen Helen Rehabilitation Center	1800 Institutional Road	Roadway Express Inc.	345 Allen Street
Loma Linda University Support Services Building	1333 S. Tippecanoe Avenue	Daugherty Company	895 Inland Center Drive

Source: California State Water Quality Control Board. Underground Storage Tank Program., Geotracker. March 29, 2005. Obtained from http://www.geotracker.swrcb.ca.gov/data/
Note: List does not include leaking fuel tanks identified on Table 5.6-4 with an asterisk.

Spills, Leaks, Investigations, and Cleanups

The Spills, Leaks, Investigations, and Cleanups (SLIC) Section of the California Environmental Protection Agency (Cal EPA) oversees activities at non-underground storage tank (UST) sites where soil or groundwater contamination have occurred. Many of these sites are former industrial facilities and dry cleaners, where chlorinated solvents were spilled, or have leaked into the soil or groundwater. The SLIC Program is set up so that reasonable expenses incurred by the State Water Resources Control Board (SWRCB) and Regional Water Quality Control Boards (RWQCBs) in overseeing water quality matters can be recovered from the responsible party.

The Santa Ana Regional Water Quality Control Board's Spill, Leaks, Investigation and Cleanup (SLIC) List (July, 2004) has identified a number of businesses in San Bernardino City that may be contaminated. It will be important to ensure that the proper environmental analysis and clean-up are conducted prior to development or redevelopment on these sites. Table 5.6-5 lists businesses on the SLIC List.

Table 5.6-6
Spills, Leaks, Investigations, and Cleanups(SLIC) in San Bernardino

Name	Location	Contaminant
US Army Training Center	296 E. 3rd Street	TCE, Benzene
Atchison, Topeka & Santa Fe	1170 W. 3rd Street	Solvent, TPH
Hanford Foundry Company	119 S. Arrowhead	Metals
Camp Ono Plume	Bunker Hill I Basin	TCE, PCE
North San Bernardino Plume	Bunker Hill II Basin	TCE, PCE
Tri City Tires	1121 S. "E" Street	Waste Oil
T.H.G. Leased Property	5518 Industrial Parkway	Metals
US Air Force – Norton	Mill Street	Solvents
Salter Company (Norton AFB)	Mill Street	Hydraulic Oil
Southern Pacific Rail Yard	Mill Street, "E" Street	TPH, PB, AS
BNSF	1500 West Rialto	TPH, Solvent
CalNev Pipeline Company	Cajon Creek Area (County)	Jet fuel

Source: Santa Ana Regional Water Quality Control Board. SLICK List. July 2004 http://www.swrcb.ca.gov/rwqcb8/html/slic_dod_section.html

Airports

San Bernardino International Airport

Prior the closure of the Norton Air Force Base in 1994, the Inland Valley Development Agency (IVDA) and San Bernardino International Airport Authority (SBIAA) were established as a regional Joint Powers Authorities formed in 1990 and 1992, respectively. The agencies serve as master developers of the 2100 acres of the former military property now known as the San Bernardino International Airport and Trade Center, which includes a full-service airport. It is located on 294 S. Leland Norton Way on the second level of the former Norton Air Force Base bounded by Interstate 10 to the south, Interstate 215 to the east, and State Route 30 to the south. This 2,100-acre facility provides domestic, international charter services, cargo/freight, and aeronautical services. In addition to the aeronautical services, this facility consisting of a 10,000-foot runway, provides 24-hour armed security and contains 80 commercial and industrial businesses, two aircraft maintenance facilities, and the 18-hole Palm Meadows Golf Course. A Comprehensive Land Use Plan (CLUP) and Airport Master Plan have not been adopted for the SBIA.

Other Airports

Ontario International Airport (ONT) is located approximately 25 miles southwest of the City. This airport is home base for approximately 425 commercial operations daily. It provides over 14 major passenger air lines and 11 major U.S. air freight carriers transporting over 6.5 million passengers and 547,461 tons of freight respectively grossing in over $ 6 billion of Regional Economic Impact for the community in 2002. This airport has flight paths that fly over parts of the City. The Riverside Municipal Airport is located approximately 12 miles south of the City and there are also two general aviation airports in the area, one to the west in Rialto and the second to the southeast in Redlands. There are also private 5 helipads in the planning area.

Wildland Fire Hazards

The fire hazard of an area is typically based on the density and type of vegetation, topography, weather, dwelling unit density, and whether or not there are local mitigation measures in place that help reduce the zone's fire rating such as an extensive network of fire hydrants, fire-rated construction, or fuel modification zones. The City of San Bernardino abuts the San Bernardino Mountains to the north, and much of its planning area is located in a high fire area. According to the City's Municipal Code Chapter 19.15, the City designates a fire overlay district identifies three foothill fire zones with different degrees of hazard based on slope, type of fuel present and natural barriers. The are divided as Fire Zone A being Extreme Hazard that includes areas with slopes of 30 percent or greater, Fire Zone B being High Hazard that includes area with slopes between 15 and 30 percent, Fire Zone C being Moderate Hazard that includes slopes between 0 and 15 percent, and Fire Zone C, Abutting Wildlands includes those lots on the perimeter of a tract that are adjacent to wildlands.

Oil, Gas and Geothermal Fields

The map of "Oil, Gas, and Geothermal Fields in California, 2001," published by the California Department of Conservation, Division of Oil, Gas & Geothermal Resources (DOGGR), shows that oil fields are not present or have been present in San Bernardino. Additionally, the City of San Bernardino does not have any known reservoirs of natural gas or petroleum. Therefore, issues associated with the development and redevelopment of oil fields, such as oil-impacted soils that need to be treated or disposed of offsite, or the proper re-abandonment of oil wells, do not apply to the San Bernardino planning area.

However, according to this map, the City of San Bernardino is located within Geothermal District 2. Numerous geothermal wells and natural geothermal seeps are associated with Geothermal District 2 and are present in the City of San Bernardino and SOI areas. While many people tend to associate properties of the natural hot springs with holistic healing within the San Bernardino and Arrowhead Springs area, geothermal resources within the City and SOI areas are not without hazards. High concentrations of mercury in the soil are coincident with surface thermal outlets. In the hot springs, mercury is more highly concentrated in the gas bubbles than in the spring water. Therefore, mercury may be enriched in soil as a result of vapor phase migration. In the Penyugal Canyon area of Arrowhead Springs (sometimes referred to as Hot Canyon Creek which is west of the hotel), soil samples of excess of 250 parts per billion (ppb) of mercury have been recorded[3]. Furthermore, natural hot springs in the Arrowhead Springs area release significant quantities of free gases (40 cc/minute), including helium, hydrogen, radon, and the light hydrocarbons; methane, ethane, propane, iso-butane, and normal butane[4].

[3] Resource Investigation of Low- and Moderate- Temperature Geothermal Areas in San Bernardino California. California Department of Conservation, Division of Mines and Geology, DMG Open-File Report 82-11, 1981

[4] Resource Investigation of Low- and Moderate- Temperature Geothermal Areas in San Bernardino California. California Department of Conservation, Division of Mines and Geology, DMG Open-File Report 82-11, 1981

5.6.1.2 Arrowhead Springs

The Arrowhead Springs Specific Plan area is currently developed as the former Arrowhead Springs Resort most recently operated by Campus Crusade for Christ, International. The facilities currently consist of approximately 34 buildings including an historic hotel, an auditorium, a chapel, dormitories, a pool and cabanas, residential bungalows, office buildings, and maintenance buildings. However, only the office, maintenance, and select bungalow buildings are currently utilized.

Historical Usage of the Arrowhead Springs Area

In 1857, Dr. David Noble Smith along with John Brown developed the springs and created the Spa at Arrowhead Springs in 1863 also known as a Hygienic Sanitarium. The first Arrowhead Hotel was built by David Noble Smith around 1868, and Messrs. Darby and Lyman of Los Angeles, who had been leasing the Hotel from Dr. Smith, built the second Arrowhead Springs Hotel in 1885. A third Arrowhead Springs Hotel was constructed in 1905, by San Bernardino businessman Seth Marshall and he started bottling "Arrowhead Springs Water", actually water from Waterman Creek, to supply customers in southern California and Arizona. In 1930, the water supply changed from Waterman Creek to springs at the 5300-foot level in Strawberry Creek to upgrade the changing water quality in Waterman Creek due to the development of homes nearby. In 1939, a new concrete hotel was constructed and after a number of owners, it was sold to Campus Crusade for Christ in 1962 and they still own the hotel and property at the present time

In addition to the site's use as a resort facility, aerial photographs of the Arrowhead Springs area indicate that small areas of the site appear to have been used for agricultural purposes (orchards and row crops) in the early 1930s. However, by 1953, much of these uses had been abandoned.

Hazardous Waste

The Arrowhead Springs Specific Plan area is not listed within on the NPL or listed on the CERCLIS List. CERCLIS status indicates that a site was once on the CERCLIS List but has No Further Response Actions Planned (NFRAP). Sites on the CERCLIS-NFRAP List were removed from the CERCLIS List in February 1995 because, after an initial investigation was performed, no contamination was found, contamination was removed quickly, or the contamination was not significant enough to warrant NPL status. The Arrowhead Springs Specific Plan area is not listed as a RCRA facility or generator. In addition, the Arrowhead Springs planning area is not listed as a State Site or a State Spill Site on the CalSite database. Furthermore, the planning area is not on the Cortese List, LUSTs, state landfills, solid waste disposal sites, or mines are located within the Arrowhead Springs Specific Plan Area.

The Arrowhead Spring Specific Plan is listed on the Federal Emergency Response Notification System (ERNS) list. Review of information regarding the listing on the Natural Response Center website database revealed the listing was due to a non-PCB transformer leak reported on December 29, 2003. According to the report, 20 gallons of oil material (non-PCB mineral) were released to water from two pole mounted transformers due to mudslides. The material released was listed as Oil, MISC: Mineral (Non-PCB). The report indicated that the leak was a single, isolated incident, the water supply was not contaminated, and the release was secured.

Proximity to High-Pressure Gas Lines or Fuel Transmission Lines

Seven companies, including the Southern California Gas Company (SCGC) which provides gas services in the vicinity of the Arrowhead Springs Specific Plan area, were identified on the Underground Service Alert (USA) website, on February 2, 2005, as companies that operate transmission lines within the planning area.

Proximity to High-Pressure Water Lines

The Municipal Water Department (MWD) is constructing the Inland Feeder Project, which is nearly 44 miles of pipeline, 12 to 14 feet in diameter, which will convey water between Devil Canyon and MWD's Colorado River Aqueduct south of Lake Perris, near the city of San Jacinto.[5],[6],[7]. The Inland Feeder project is designed to increase Southern California's water supply reliability in the face of future weather pattern uncertainties. The east branch of the Inland Feeder water project obtains its source water from Lake Silverwood. The high-capacity, gravity fed pipeline will be capable of delivering water at a rate of 31 m^3/sec (1,000 cfs) or 646 million gallons a day. A portion of the Inland Feeder Project transverses the Arrowhead Springs Specific Plan area (see Figure 3.3-11). The Arrowhead segment of the Inland Feeder Project enters the Arrowhead Springs property on the western property boundary through the West Portal tunnel from Devil Canyon, continues eastward and then southward for approximately 1,480 feet through the property before entering the Strawberry Creek Portal and tunnel to the City Creek portal. According to the contractor, these new tunnels are designed to withstand 900 ft of hydrostatic water pressure, a standard no tunnel in the world has ever had to meet.[8]

Underground Storage Tanks

Review of the County of San Bernardino Fire Department CUPA on February 23, 2005 revealed six underground storage tanks were removed or abandoned at the subject site in 1989.

Five USTs were removed under permit number SB-73-88 on February 1, 1989. Soil samples were taken from soils in the vicinity of the USTs at the maintenance building and the ranger station by Alms Services, Inc. The job inspection record indicates that the site will be final and approved for backfill upon test results. Test results provided to the County of San Bernardino Department of Environmental Health (DEH) dated March 9, 1989, were located in the file. According to the San Bernardino County Fire Department Hazardous Materials Division, there are no environmental concerns associated with the five tanks removed at the subject site.

The remaining historic UST is located adjacent to the current hotel. Research revealed plans to fill this UST in place based on the proximity to the hotel foundation. Water was properly removed from the tank and soil samples were taken in the vicinity of the UST. Based on the samples collected, the DEH issued a letter, dated May 10, 1989, stating residual hydrocarbon contamination near the hotel UST was not at a level to warrant further investigation. A letter approving the closure of the hotel UST by filling in place was dated July 25, 1989. No documentation indicating that the UST was filled is available in the files reviewed. According to the San Bernardino County Fire Department Hazardous Materials Division, although a closure letter cannot be issued based on the lack of documentation that the UST was properly filled-in place, the area surrounding the site is not contaminated and the UST does not represent an environmental concern at this time.

Two active USTs currently exist on the subject site. The USTs are operated under the current permit numbers PT0011599 and PT0011600. The USTs were upgraded in 1998 and soils were sampled in conjunction with the upgrades. A "no further investigation" letter was issued for the active USTs on January 29, 1999, and an upgrade compliance certificate was issued on February 3, 1999.

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[5] California Regional Water Quality Control Board. Amendment to Order No. 99-21, NPDES No. CA8000394,. Obtained April 2005 from http://www.waterboards.ca.gov/santaana/pdf/01-14.pdf

[6] Metropolitan Water District of Southern California. *Riverside Badlands Tunnel, Inland Feeder Project: The Challenges Between Concept and Completion.* Obtained April 2005 from http://www.hatch.ca/Infrastructure/Riverside_BadlandsTunnels_feeder.pdf

[7] Metropolitan Water District of Southern California*. Inland Feeder Project at a Glance*. Obtained April 2005 from http://www.mwdh2o.com/mwdh2o/pages/yourwater/supply/inlandfdr01.html

[8] Polar Inertia. (2005, March/April). Water Infrastructure. Inland Feeder Project. http://www.polarinertia.com/mar05/water01.htm

Recognized Environmental Conditions and Known or Suspect Environmental Conditions

A site visit to observe site conditions was conducted on February 1, 2005 to observe the exterior portions of the property, including the Arrowhead Springs boundaries.

Use, Storage, and Disposal of Petroleum Products and Hazardous Materials

During site reconnaissance, oil was observed to be stored in approximately five 55-gallon metal drums located on a paved area near the maintenance buildings. Staining and leaking were observed on the ground in areas surrounding the 55-gallon waste-oil drum. Fuel dispensing pumps at the site were also observed onsite. Four to five drums of unknown contents were observed to be stored in various locations near the maintenance buildings. The drums were located on a dirt surface. No staining or leaking was observed in the vicinity of the drums. Approximately 30, one-gallon buckets of paint were observed near the maintenance buildings. The paint cans were located on an uncovered, open dirt area. The location did not appear to be temporary storage. No leaking or staining was observed in the vicinity of the paint cans.

No evidence of disposal of Petroleum Products was observed at the subject site. However, leaking and staining from waste oil drums were observed on site. A fueling dispensing pump was observed near the maintenance buildings. A parts washer was observed in one of the maintenance buildings. Records show that waste oil and liquid from the parts cleaner are removed by a certified waste hauler.

Vehicle Maintenance Lifts

One vehicle maintenance lift was observed on the subject site that was thought not to be in use since the early 90's. However, during the site inspection, a vehicle was on the lift and elevated off the ground surface. Evidence of staining was observed in the vicinity of the vehicle maintenance lift. There was no previous knowledge of historic leaking or staining in the vicinity of the vehicle maintenance lift.

Polychlorinated Biphenyls (PCBs) Associated with Electrical or Hydraulic Equipment

Various transformers were located at the subject site. No PCB labels were visible on the pad-mounted transformers observed with the exception of one transformer. No staining or leaking was observed in the vicinity of the transformers. Reports from 1984 indicated capacitors located at the site contained PCBs. The Arrowhead Springs Specific Plan is listed on the Federal ERNS due to a non-PCB transformer leak reported on December 29, 2003. However, the leak was a single, isolated incident, the water supply was not contaminated, and the release was secured. The capacitors and transformers were gradually switched from PCB filled to non-PCB filled and the transformer with the PCB label is no longer used.

Catch Basins

The Arrowhead Springs property has a limited storm water collection system for the developed portions of the property containing approximately 55 catch basins. Not all streets have curbs, gutters and catch basins and water sheet flows to landscaped areas. Storm water captured by the underground system is eventually released to area streams.

Pits, Ponds, Lagoons, and Pools of Liquid

The subject site has many water resources including natural hot springs, and surface waters. Creeks located on the site include East Twin Creek, Strawberry Creek, Hot Canyon Creek (unnamed tributary on USGS quad maps west of hotel), and West Twin Creek are located on the site. Numerous hot springs are known to exist on the site, and Lake Vonette, with an area of 32,670 square feet, is located on the site. Other pools of liquids located on the site include the swimming pool, water reservoirs, and evaporation ponds associated with the sewage treatment facility.

Solid Waste and Evidence of Waste Filling

Solid waste is contained in trash dumpsters located in a trash enclosure located on the subject site. Solid waste generated at the site is removed by a private collection contractor. No evidence of waste filling was observed on the subject property.

Historic trash pits and incinerators may be located on the subject site. According to archaeological reports (Appendix C) there are three possible historic trash pits and one historic incinerator located on the subject site based on their investigation and previous research done on the site. The trash areas reported appear to be old and isolated events, and do not represent areas of environmental concern. The majority of the trash located on the site was most likely incinerated, historically a common method of trash removal, and one small incinerator is known to exist on the subject site. Ash from the trash incineration if located in the vicinity of the known incinerator could be a potential environmental condition.

Sewage Treatment System

Sanitary sewerage is conveyed to the sewage treatment facility located on the southern portion of the site. The sewage treatment facility, more fully described in Section 5.15, *Utilities,* has a 300,000 gallon capacity and was built in approximately 1939. Currently, the sewage treatment facility was observed to be handling a small volume of waste. Biosolid quantities have never been large enough to move more than two 2½-yard backhoe bucketsful at any given time according to the present facilities operator. However based on historical use of the hotel and aerial photographs, it is likely the sewage treatment facility handled a larger volume of waste in the past when the hotel was in operation.

A file review was conducted at the Santa Ana Regional Water Quality Control Board (RWQCB). Files available for review date back to 1986. Review of the files revealed the sewage treatment is regulated by Waste Discharge Requirements specified in Order No. 86-100. Order No. 86-100 was adopted for the subject site on June 13, 1986. The facility had no violations recorded in the file. The monitoring records reviewed indicated that the wastewater was repeatedly over the permitted limit for total dissolved solids and hardness, and occasionally over the permitted limit for sodium, sulfate, chloride, and fluoride. No actions were taken regarding the elevated concentrations. The permit levels were based on the use of surface water, but the subject site is now using deep groundwater that is of poorer quality. Inspection reports from July 11, 2001 indicated that it is very possible that the elevated concentrations are caused from the change to the poorer quality water source.

Review of the Santa Ana Regional Water Quality Control Board revealed a sewage spill on the subject site on February 13, 1987. The sewage spill reportedly happened at the sewer man hole near the cabana pool area. The sewage flowed towards Strawberry Creek, but did not reach the creek. Approximately 100,000 gallons of sewage was spilled. An inspector visited the area after the spill was cleaned and noted that the area of the spill occurred down a steep hill that did not appear to be visited often.

Files revealed a sewage spill on the subject site on February 13, 1987. The sewage spill reportedly happened at the sewer man hole near the cabana pool area. The sewage flowed towards Strawberry Creek, but did not reach the creek. Approximately 100,000 gallons of sewage was spilled. An inspector visited the area after the spill was cleaned and noted that the area of the spill was down a steep hill that did not appear to be visited often.

Review of inspection reports indicated that sludge disposal has been a concern at least three times since 1986. A figure dated 1986 indicating the location of the sewage treatment facilities showed an area designated for sludge disposal between the holding ponds and the sewage treatment plant. An Inspection Report dated September 22, 1997 indicated that sludge was accumulating in the drying bed. Previously sludge was mixed with saw dust and used in the nearby field. In the comment section of both the 1998 and 2000 inspection reports, plant operators could not indicate a location for ultimate disposal of sludge. The

inspection comments from the 2000 inspection indicated that several piles of sludge were piled up on the west side of the sludge drying bed.

5.6.2 Thresholds of Significance

According to Appendix G of the CEQA Guidelines, a project would normally have a significant effect on he environment if the project would:

H-1 Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.

H-2 Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.

H-3 Emit hazardous emissions or handle hazardous or acutely hazardous materials, substance, or waste within one-quarter mile of an existing or proposed school.

H-4 Be located on a site which is included on a list of hazardous materials compiled pursuant to Government code Section 65962.5 and, as a result, would create a significant hazard to the public or the environment.

H-5 For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would result in a safety hazard for people residing or working in the project area.

H-6 For a project in the vicinity of a private airstrip, result in a safety hazard for people residing or working in the project area.

H-7 Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.

H-8 Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to the urbanized areas or where residences are intermixed with wildlands.

5.6.3 Environmental Impacts

The following impact analysis addresses thresholds of significance for which the Initial Study disclosed potentially significant impacts. The applicable thresholds are identified in parentheses after the impact statement. An analysis of the project impacts, as they relate to hazards and hazardous materials in the San Bernardino area and the Arrowhead Springs Specific Plan area, are provided in this section of the EIR.

5.6.3.1 San Bernardino General Plan Update

The General Plan Update involves minimal changes to existing land use designations in San Bernardino and the SOI, and is primarily focused on an update to the goals and policies contained in the existing General Plan. The Safety Element addresses hazardous and toxic material issues.

GP IMPACT 5.6-1: ***BUILDOUT IN ACCORDANCE WITH THE CITY OF SAN BERNARDINO GENERAL PLAN MAY RESULT IN ADDITIONAL COMMERCIAL AND INDUSTRIAL FACILITIES THAT WOULD NECESSITATE THE TRANSPORT, USE AND/OR DISPOSAL OF HAZARDOUS MATERIALS. [THRESHOLDS H-1, H-2, AND H-3]***

Impact Analysis: Buildout of the San Bernardino General Plan would result in an increase in the frequency of transport, use and disposal of hazardous materials associated with commercial and industrial growth within the City of San Bernardino. While care is taken during the transport, use and disposal of hazardous material within the City, it is possible that upset or accidental conditions may arise which result in the release of hazardous materials into the environment.

Table 5.6-2 identifies seven hazardous waste transporters within the City. An increase in the transport of hazardous waste from an increased demand for transport, use and disposal, within or outside the City, could result in more accidental events resulting in the release of hazardous materials into the environment. An increase in the transport of hazardous materials, as a result of the proposed project, would be limited to areas along interstates and the rail lines, where commercial uses and industrial use would be concentrated. Some transport of hazardous materials may occur near small commercial pockets proposed throughout various areas of the City. The transportation of hazardous materials and waste within the City is directed toward arterial streets because they generally have better roadway conditions than local streets. The signalization, width, and level of service of a roadway impact the safety and speed at which hazardous materials can be safely transported through an area. Arterial streets are also preferred routes to local streets because they can minimize the exposure of residential uses from the impacts that could occur from a hazardous material accident within a local neighborhood

The City of San Bernardino contains both small generators of hazardous waste. According to the Spills, Leaks, Investigation and Cleanup (SLIC) List, shown in Table 5.6-6, the Santa Ana RWQCB has identified 11 sites within the City that are or may be contaminated due to accidental release of hazardous waste. Furthermore, the State Water Resource Control Board database for Leaking Underground Fuel Tanks (LUFTs) indicates that there are 181 cases in the City of San Bernardino San Bernardino. Due to the relative depth to the groundwater, which in some cases is within 50 feet of the surface, the chance for groundwater contamination is a possibility. Regional faults associated with the San Andreas and San Jacinto Fault zone are nearby seismic sources with a relatively high probability of generating an earthquake. Intensification of land uses that generate hazardous waste nearby these faults, including faults located within the Alquist-Priolo Special Studies Zones, could be susceptible to the effects of surface fault rupture from nearby faults resulting in accidental release of waste.

The update of the General Plan would not result in the placement of hazardous waste generating facilities within one quarter mile of a school. Industrial uses, which are the primary hazardous waste generating facilities in the City, are currently concentrated along existing industrial corridors and that would not change. Furthermore, while implementation of the General Plan would result in the need for more school facilities (See Section 5.13, Public Services), placement of schools would not be allowed within one quarter mile of a school.

GP IMPACT 5.6-2: ***THE CITY OF SAN BERNARDINO CONTAINS PROPERTIES INCLUDED ON A LIST OF HAZARDOUS MATERIALS SITES, INCLUDING THE FORMER NORTON AIR FORCE BASE. [THRESHOLD H-4]***

Impact Analysis: The former Norton AFB is located within the City of San Bernardino and is listed on the NPL and has been designated a Superfund Site. Implementation of the City of San Bernardino General Plan would not result in direct development on the former Norton AFB but it is part of the Southeast Strategic Planning Area along with the Trade Center. These two areas are not managed by the City. The Trade Center

is managed by a joint powers authority known as the Inland Valley Development Authority and is addressed in the Trade Center Specific Plan and San Bernardino International Airport Authority manages the former base. According to the EPA, the response actions taken for contaminated soils and groundwater have significantly reduced the potential for exposure to contaminants at the site.[9] An Airport Master Plan for the facility has not been finalized but the area contains commercial uses, industrial uses, and an 18-hole Palm Meadows Golf Course. See Section 5.8, *Land Use and Planning,* for more information regarding integration of the Airport Master Plan and the General Plan. Separate environmental documentation would be required for implementation of the Airport Master Plan.

In addition to the designated Superfund site above, the Newmark Groundwater Contamination site is also listed on the NPL. The Newmark Groundwater Contamination Site is located within the Bunker Hill Subbasin, underneath the City of San Bernardino. Contaminants of the groundwater basin include chlorinated solvents, PCE and TCE. More than 25 percent of the municipal water supply for the City of San Bernardino's residents has been affected by the advancing contamination plumes. The plume lies underneath a portion of the City that has been developed for light industrial and residential uses. After adding this site to the NPL, the EPA performed preliminary investigations and determined that no immediate actions were required at the Newmark Groundwater site while studies are ongoing and final cleanup activities are being planned. However, the San Bernardino Municipal Water Department has constructed and operated four wellhead treatment systems to ensure the safety of the public water supply.[10]

In addition to these sites, the CERCLIS List identifies seven other sites within the City. None of these sites have been placed on the NPL.

GP IMPACT 5.6-3: THE SAN BERNARDINO INTERNATIONAL AIRPORT IS LOCATED WITHIN THE CITY OF SAN BERNARDINO. [THRESHOLDS H-5 AND H-6]

Impact Analysis: The San Bernardino International Airport (formerly Norton Air Force Base) is located within the southeastern portion of the City of San Bernardino. Because of the long term use of the facility by aircraft, many of the existing, surrounding land uses are industrial or commercial. However, there are existing residential uses scattered to the southwest of the airport as well. The General Plan update has retained the land use designations for industrial around the airport which would prohibit any new residential uses that could be affected by the airport. Policies in the proposed General Plan also address compatibility with the noise and safety zones in terms of land use, density, and height. Upon adoption of the CLUP and Airport Master Plan, the General Plan would be amended to incorporate the adopted noise contours and safety zones and any new airport related policies. The Airport Influence Area was adopted by the SBIA and is incorporated in the General Plan update. In this manner, the required notification and buyer disclosure is addressed in the General Plan. Overall the General Plan update provides sufficient protection from airport safety hazards.

GP IMPACT 5.6-4: BUILDOUT OF THE CITY OF SAN BERNARDINO GENERAL PLAN WOULD NOT AFFECT THE IMPLEMENTATION OF THE SAN BERNARDINO COUNTY FIRE DEPARTMENT OFFICE OF EMERGENCY SERVICES' EMERGENCY MANAGEMENT PLAN. [THRESHOLD H-7]

Impact Analysis: The San Bernardino City Fire Department has a Hazardous Materials Response Team is specially trained and equipped to handle hazardous materials releases in the event of an emergency. If the fire and police departments determine that an incident requires special expertise and equipment, they may request assistance from the Countywide HazMat Team of the County Environmental Health Department. The

[9] Environmental Protection Agency. Norton Air Force Base California EPA ID# CA4570024345. http://yosemite.epa.gov/r9/sfund/overview.nsf/0/671c34603a1b50098825660b007ee697?OpenDocument

[10] Environmental Protection Agency. Newmark Groundwater Contamination Site. California EPA ID# CAD981434517 http://yosemite.epa.gov/r9/sfund/overview.nsf/0/5a50a68ada6060e58825660b007ee691?OpenDocument#descr

HazMat Team includes a minimum of two fire specialists and two environmental health specialists who perform hazard identification, risk assessment, and actual control measures. HazMat is a cooperative organization structure that is intended to bring the maximum available equipment and special expertise to any given emergency situation. In addition the San Bernardino County Fire Department Office of Emergency Services is responsible for disaster planning and emergency services coordination throughout the county. The Office of Emergency Services prepares the countywide Emergency Management Plan. Implementation of the San Bernardino General would not interfere with the implementation of this emergency response plan or evacuation route of the Office of Emergency Services. The improvements to the street system outlined the Circulation Element of the General Plan update would improve the time necessary to respond to all emergency situations.

GP IMPACT 5.6-5: ***THE NORTHERN PORTION OF THE CITY OF SAN BERNARDINO IS LOCATED WITHIN A DESIGNATED EXTREME FIRE HAZARD ZONE AND INCREASED DEVELOPMENT WOULD EXPOSE STRUCTURES AND/OR OCCUPANTS TO FIRE DANGER. [THRESHOLD H-8]***

Impact Analysis: The City of San Bernardino abuts the San Bernardino Mountains to the north. The City of San Bernardino is susceptible to wildland fires due to the steep terrain and highly flammable chaparral vegetation of the foothills of the San Bernardino Mountains and high winds that correspond with seasonal dry periods. The characteristics of the San Bernardino Mountains and winds in the area indicate that large uncontrollable fires on a recurring basis are inevitable. Major fires have endangered portions of the City on numerous occasions and in several instances, have spread into the City causing extensive damage, most recently in 2003.

As a result, the entire northern portion of the City of San Bernardino is located in an extreme and moderate fire hazard zone. Much of the vacant land within the City of San Bernardino lies within the hillside portions of the City that are within an area designated as an extreme fire hazard and a moderate fire hazard. The danger from wildland fires in foothill locations is increased by the number of structures and encroachment of new development in the hillside areas. Specific concerns include the density of development, spacing of structures, brush clearance, building materials, access to buildings by fire equipment, adequacy of evacuation routes, property maintenance, and water availability.

Relevant General Plan Policies and Programs

The relevant General Plan goals and policies pertaining to hazards include the following:

Land Use Element: Safety

Policy 2.8.1: Ensure that all structures comply with seismic safety provisions and building codes.

Policy 2.8.2: Ensure that design and development standards appropriately address the hazards posed by wildfires and wind, with particular focus on the varying degrees of these threats in the foothills, valleys, ridges, and the southern and western flanks of the San Bernardino Mountains.

Policy 2.8.4: Control the development of industrial and other uses that use, store, produce, or transport toxics, air emissions, and other pollutants.

Policy 2.9.1: Require that all new development be consistent with the adopted Comprehensive Land Use Plan for the San Bernardino International Airport and ensure that no structures or activities encroach upon or adversely affect the use of navigable airspace.

Policy 2.9.2: Refer any adoption or amendment of this General Plan, specific plan, zoning ordinance, or building regulation within the planning boundary of the adopted Comprehensive Airport Master Plan for the SBIA to the airport authority as provided by the Airport Land Use Law.

Policy 2.9.3: Limit the type of development, population density, maximum site coverage, and height of structures as specified in the applicable safety zones in the Comprehensive Land Use Plan for the SBIA and as shown on Figure LU-4.

Policy 2.9.5: Ensure that the height of structures does not impact navigable airspace, as defined in the Comprehensive Land Use Plan for the SBIA.

Policy 2.9.6: As required by State Law for real estate transactions within the Airport Influence Area, as shown on Figure LU-4, require notification/disclosure statements to alert potential buyers and tenants of the presence of and potential impacts from the San Bernardino International Airport.

Circulation Element

Policy 6.5.1: Provide designated truck routes for use by commercial/industrial trucking that minimize impacts on local traffic and neighborhoods.

Policy 6.7.4: Identify existing and future high volume at-grade railroad crossings and pursue available sources of funding (e.g., California Public Utilities Commission) to implement grade separations where appropriate.

Policy 6.8.1: Work with the San Bernardino International Airport Authority in the preparation of the Airport Master Plan and Comprehensive Land Use Plan to ensure the City's interests are foremost in the improvement of the airport.

Public Facilities and Services Element:

Policy 7.2.1: Assure that adequate facilities and fire service personnel are maintained by periodically evaluating population growth, response time, and fire hazards in the City.

Policy 7.2.2: Assess the effects of increases in development density and related traffic congestion on the provision of adequate facilities and services ensuring that new development will maintain fire protection services of acceptable levels.

Policy 7.2.3: Establish a program whereby new development projects are assessed a pro rata fee to pay for additional fire service protection to that development.

Policy 7.2.4: Coordinate inter-agency fire service protection agreements with County U.S. Forest Service, and other fire protection agencies.

Policy 7.2.5: Maintain an "ISO" fire rating of at least class 3.

Safety Element:

Policy 10.1.1: Employ effective emergency preparedness and emergency response strategies to minimize the impacts from hazardous materials emergencies, such as spills or contamination.

Policy 10.1.2: Ensure the protection of surface and groundwater quality, land resources, air quality, and environmentally sensitive areas through safe transportation of waste through the City and comprehensive planning of hazardous materials, wastes, and sites.

Policy 10.1.3: Execute long-range planning programs to protect resources and the public from the potential impacts that could be created by the use, storage, transport, and disposal of hazardous waste and materials.

Policy 10.1.4: Continue to support the role that the Fire and the Police Departments play in the on-site identification of hazardous wastes and emergency response to hazardous waste accidents in cooperation with the County Department of Environmental Health Services.

Policy 10.2.1: Require the proper handling, treatment, movement, and disposal of hazardous materials and hazardous waste.

Policy 10.2.2: Encourage businesses to utilize practices and technologies that will reduce the generation of hazardous wastes at the source.

Policy 10.2.3: Implement federal, state, and local regulations for the disposal, handling, and storage of hazardous materials.

Policy 10.2.4: Work with the Department of Environmental Health Services to promote waste minimization, recycling, and use of best available technology in City businesses.

Policy 10.2.5: Participate in the process of selecting routes that are the most acceptable for the safe transportation of hazardous waste material within the City limits. Streets with high concentrations of people, such as the downtown, or with sensitive facilities, such as schools and parks, should be avoided to the maximum extent possible.

Policy 10.3.1: Conduct educational programs to educate the public about the proper handling and disposal of household hazardous wastes.

Policy 10.3.2: Enforce the proper disposal of Household Hazardous Wastes.

Policy 10.4.1: Promote integrated inter-agency review and participation in water resource evaluation and mitigation programs.

Policy 10.4.2: Protect surface water and groundwater from contamination.

Policy 10.4.3: Eliminate or remediate old sources of water contamination generated by hazardous materials and uses.

Policy 10.4.4: Develop programs and incentives for prevention of groundwater contamination and clean up of known contaminated sites.

Policy 10.11.1: Continue to conduct long-range fire safety planning efforts to minimize urban and wildland fires, including enforcement of stringent building, fire, subdivision and other Municipal Code standards, improved infrastructure, and mutual aid agreements with other public agencies and the private sector.

Policy 10.11.2: Work with the U.S. Forest Service and private landowners to ensure that buildings are constructed, sites are developed, and vegetation and natural areas are managed to minimize wildfire risks in the foothill areas of the City.

Policy 10.11.3: Require that development in the High Fire Hazard Area, as designated on the Fire Hazards Areas Map (Figure S-8) be subject to the provisions of the Hillside Management Overlay District (HMOD) and the Foothill Fire Zones Overlay.

Policy 10.11.4: Study the potential acquisition of private lands for establishment of greenbelt buffers adjacent to existing development, where such buffers cannot be created by new subdivision.

Policy 10.11.5: Continue to require that all new construction and the replacement of 50 percent and greater of the roofs of existing structures use fire retardant materials.

Policy 10.12.1: Maintain a functional City emergency response plan that addresses all hazards.

Policy 10.12.2: Foster and participate in ongoing emergency preparedness and response training programs.

Policy 10.12.3: Enhance emergency preparedness through the implementation of community education and self-help programs.

Policy 10.12.4: Prevent serious damage and injuries through effective hazard mitigation.

Policy 10.12.5: Maintain mutual aid agreements with neighboring cities and the County of San Bernardino and develop partnerships to respond to disaster with other emergency relief organizations.

Policy 10.12.6: Ensure that sensitive uses, such as the University and other public uses that accommodate many occupants, have adequate access to allow emergency personnel to access the site in the event of an emergency.

Policy 10.13.1: Establish and maintain a rapid damage assessment capability through the formation of damage assessment strategies that are applied by the appropriate City Staff or inspection personnel.

Policy 10.13.2: Develop programs, options, and procedures to promote the rapid reconstruction of the City following a disaster, and to facilitate a specific upgrading of the community environment.

Policy 10.13.3: Identify alternative sources of financing of damage and reconstruction that can be utilized in the event of a disaster.

Policy 10.13.4: Encourage public awareness of emergency response planning and emergency evacuation routes.

5.6.3.2 Arrowhead Springs Specific Plan

The Arrowhead Springs Specific Plan consists of approximately 1,916 acres. A portion of the planning is currently developed and 10 acres near SR 18 is owned by the MWD. The Arrowhead Springs Specific Plan is a guiding document, which details the overall plan for the development of future projects on approximately 506 acres. The remaining area would be left as open space. The Arrowhead Springs Specific Plan would expand the existing resort area which covers approximately 200 acres and add a golf course, commercial and residential areas to the site.

AHS IMPACT 5.6-1: ARROWHEAD SPRINGS SPECIFIC PLAN OPERATIONS WOULD INVOLVE THE TRANSPORT, USE AND/OR DISPOSAL OF HAZARDOUS MATERIALS OR RELEASE OF HAZARDOUS MATERIALS. [THRESHOLDS H-1, H-2, AND H-3]

Impact Analysis: The Arrowhead Springs Specific Plan would involve intensification of resort uses and placement of new residential and commercial areas with the area. As a result, the routine transport, use, or disposal of hazardous materials would increase in the Arrowhead Springs area. This increase would be limited to commercial uses such as retail operations and golf course, as no industrial uses are planned in the Arrowhead Springs Specific Plan. However, there are a number of recognized environmental conditions such as waste oil spills, sewage sludge that may have leached metals into the ground and ash from incineration (all described in Section 5.6.1.2) that have the potential to release hazardous materials if disturbed by grading and other construction activities.

The Arrowhead Springs Area is located on the map of "Oil, Gas, and Geothermal Fields in California, 2001," published by the California Department of Conservation, Division of Oil, Gas & Geothermal Resources (DOGGR), as a geothermal area. Geothermal activity in the Arrowhead Springs area have been noted to have naturally occurring emissions of mercury, helium, methane, propane and radon. As a result of deposition of mercury in site soils, metal content may be located in high concentrations where geothermal activity is present. Mercury is a known toxic and exposure to mercury in high concentrations can create a significant hazard to the public or the environment. Mercury concentrations in the Arrowhead Springs area are expected to be concentrated near the hot springs and can occur near geothermal vent areas as high concentrations of mercury in the soil are coincident with surface thermal outlets. In the hot springs, mercury is more highly concentrated in the gas bubbles than in the spring water. Therefore, mercury may be enriched in soil as a result of vapor phase migration. As mentioned previously, In the Penyugal Canyon area of Arrowhead Spring soil samples in excess of 250 ppb (0.25 ppm) of mercury have been recorded[11]. The standard for elemental mercury in soils is 1.1 microgram/kilogram (or 1.1 ppm). For Radon the EPA standard is 4 picocuries per liter for indoor air. Methane in the Arrowhead Springs area within the vicinity of the (former) Campus Crusade for Christ (facilities) was noted at 4,506 ppm in January of 1982.[7] Although methane is not a direct risk human health, concentrations above the lower explosive limit may accumulate beneath structures, presenting a potential fire hazard. According to the US Mine Rescue Association, methane is explosive at concentrations of 5 to 15 percent. At amounts greater than 15 percent, the amount of oxygen present is insufficient for rapid combustion to occur. Without subsequent study or monitoring the risk of exposure can not be accurately determined from existing (and dated) information.

The Inland Feeder Project of MWD transverses the Arrowhead Springs project site. Specifically, the Village Walk development around Lake Vonette would be placed in close proximity to the existing water line. The Public safety issues related to the Inland Feeder Project are related to the potential for catastrophic failure of the pipeline and the resulting uncontrolled release of water. The level of significance of this impact is based on the probability of this type of event occurring and the ability of existing water courses to accommodate the released flow. According to the FEIR for the Inland Feeder Project, probability of failure ranged from 0.13 to 0.03 for the San Andreas Fault and 0.0003 to 0.0006 for the San Jacinto Fault. If a fault rupture were to occur, the volume of water released could be accommodated by the Santa Ana River water diversion facilities (percolation basins south of the project site). These water diversion facilities, along with a low probability of occurrence, result in risk of failure at or below most civil engineering projects.

[11] *Resource Investigation of Low- and Moderate- Temperature Geothermal Areas in San Bernardino California*. California Department of Conservation, Division of Mines and Geology, DMG Open-File Report 82-11, 1981

AHS IMPACT 5.6-2: ***THE ARROWHEAD SPRINGS SPECIFIC PLAN AREA IS NOT ON ANY LIST OF HAZARDOUS MATERIALS COMPILED PURSUANT TO GOVERNMENT CODE SECTION 65962.5. [THRESHOLD H-4]***

Impact Analysis: Review of the CERCLIS database under the Phase I Environmental Site Assessment for Arrowhead Springs Resort indicated that the Arrowhead Springs Specific Plan area is not listed on the NPL or listed on the CERCLIS List. The Arrowhead Springs Specific Plan area is not listed as a RCRA facility or generator. In addition, the Arrowhead Springs planning area is not listed as a State Site or a State Spill Site on the CalSite database.

AHS IMPACT 5.6-3: ***THE ARROWHEAD SPRINGS SPECIFIC PLAN AREA IS NOT LOCATED IN THE VICINITY OF AN AIRPORT OR UNDER THE WITHIN THE JURISDICTION OF AN AIRPORT LAND USE PLAN. [THRESHOLDS H-5 AND H-6]***

Impact Analysis: The Arrowhead Springs Specific Plan area is not located within the vicinity of a public or private airport. The closest airport to the site is the San Bernardino International Airport located on the southern side of the City while the Arrowhead Springs area is located in the mountains to the north.

AHS IMPACT 5.6-4: ***BUILDOUT OF THE ARROWHEAD SPRINGS SPECIFIC PLAN WOULD NOT AFFECT THE IMPLEMENTATION OF THE SAN BERNARDINO COUNTY FIRE DEPARTMENT OFFICE OF EMERGENCY SERVICES, EMERGENCY MANAGEMENT PLAN. [THRESHOLD H-7]***

Impact Analysis: The San Bernardino County Fire Department Office of Emergency Services is responsible for disaster planning and emergency services coordination throughout the county. The Office of Emergency Services prepares the countywide Emergency Management Plan. The Arrowhead Springs Specific Plan would result in the addition of residential uses in an area currently dominated by little used resort/recreational facilities. Currently the main access road for the Arrowhead Springs Specific Plan area is SR18. The increase in development to this secluded area in the mountains has the potential to impact emergency response or evacuation plan for the area. However, the circulation plan and street widths for the proposed development were designed in consultation with the San Bernardino City Fire Department to ensure adequate emergency access and the Village Avenue access road was added to provide for emergency access in the event of a fire, earthquake, or other such hazard.

AHS IMPACT 5.6-5: ***THE ARROWHEAD SPRINGS SPECIFIC PLAN AREA IS WITHIN A DESIGNATED EXTREME FIRE HAZARD ZONE AND COULD EXPOSE STRUCTURES AND/OR OCCUPANTS TO FIRE DANGER. [THRESHOLD H-8]***

Impact Analysis: The Arrowhead Springs Specific Plan area lies within the San Bernardino Mountains and falls within an area designated as an extreme hazard zone. The Arrowhead Springs area is susceptible to wildland fires due to the steep terrain, highly flammable vegetation and high winds that correspond with seasonal dry periods. The San Bernardino National Forest surrounds the Arrowhead Springs area to the north, east and west. Placement of structures in the Arrowhead Springs area, adjacent to the wildland areas, could place occupants of these structures at risk of injury or death due to fire.

5.6.4 Existing Regulations and Standard Conditions

The existing regulations and standard conditions pertain to both the San Bernardino General Plan and the Arrowhead Springs Specific Plan.

- Both the Federal government (Code of Federal Regulations, EPA, SARA and Title III) and the State of California (California State Health and Safety Code, Division 20, Chapter 6.95, Sections 25500–25520; California Code of Regulations, Title 19, Chapter 2, Sub-Chapter 3, Article 4, Sections 2729–

2734) require all businesses that handle more than a specified amount of hazardous materials or extremely hazardous materials, termed a reporting quantity, to submit a Hazardous Materials Business Plan to its local CUPA. The HMD of the San Bernardino County Fire Department is designnated by the State Secretary for Environmental Protection as the CUPA for the County of San Bernardino in order to focus the management of specific environmental programs at the local government level to address the disposal, handling, processing, storage and treatment of local hazardous materials and waste products.

- The City of San Bernardino designates the San Bernardino County Department of Environmental Health Services (DEHS) as the enforcement agency for the purpose of the California Health and Safety Code Section 480 et seq., 500 et seq., 1155.5, Title 17 of the California Administrative Code, [now California Code of Regulations] and all state law pertaining to environmental health. (Chapter 8.01 of the City of San Bernardino Municipal Code)

- The City of San Bernardino Municipal Code prohibits the accumulation of combustible and non-combustible materials except within buildings or in containers or receptacles designed for such storage and accumulation. (Chapter 18.18 of the City of San Bernardino Municipal Code)

- Section 19.30.200, Access, of the City of San Bernardino Municipal Code provides regulations for ensuring adequate emergency access to subdivisions. A tentative tract or parcel map shall provide for at least 2 different standard routes for ingress and egress. However, the City provides an exception to this standard if the tentative track map or parcel map provides 1 standard route but the standard route must be a roadway that is dedicated to the City; has a minimum paved width of 24 feet; and is designed to utilize separate roadways or streets, or a common street that provides access from opposite directions (provided that the access from each direction utilizes an independent street system). The purpose of these routes is to permit accessibility to fire fighting and other public equipment and to permit orderly evacuation in the event of flood, fire or other emergency. Prior to recordation of the final map, adequate security shall be provided to ensure construction of the required improvements before any certificate of occupancy is issued.

- Section 19.15, FF (Foothill Fire Zones Overlay) District of the San Bernardino Municipal Code details additional restrictions and requirements for new developments within the foothills and mountainous portion of the City of San Bernardino. This includes design standards for access, construction, and development and requirements for roadside vegetation, water supply, and erosion control.

- Section 19.12, Airport Overlay District, of the City of San Bernardino Municipal Code outlines restrictions, regulations and design for development within the vicinity of the San Bernardino International Airport (The Airport Overlay District would be adjusted to reflect the Airport Master Plan after it is adopted).

- The 2001 (and subsequent amendments) California Building Code (CBC) regulates the design and construction for building relating to fire and life safety and structural safety from which all developments in California must adhere to. In addition Part 9 of the CBC is the California Fire Code which contains fire-safety specific related building standards. For hazardous air releases, Article 79 and 80 of the Fire Code allows oversight of design by the San Bernardino County Fire Department pertaining to materials and facilities requirements for flammable and combustible liquids and gases.

- The South Coast Air Quality Management District (AQMD), Air Toxics Division, regulates the release of methane and other toxic air contaminants from facilities. Although the AQMD does not regulate emissions from naturally occurring sources, under the current regulations facilities that emit, through mechanical device or operation, air toxics must obtain relevant permits through the AQMD.

- Per the City of San Bernardino Municipal Code, Section 19.02, new developments and plans are reviewed by a Development Review Committee and an Environmental Review Committee, which includes a member from the City of San Bernardino Fire Department. Tentative Tract maps within the City of San Bernardino are reviewed by the San Bernardino Fire Department to ensure adequate emergency access for emergency vehicles.

5.6.5 Level of Significance Before Mitigation

5.6.5.1 San Bernardino General Plan Update

Upon implementation of GP policies and programs, regulatory requirements, and standard conditions of approval, the following impacts would be less than significant:

GP Impact 5.6-1 Implementation of the San Bernardino General Plan anticipates growth in commercial and industrial facilities that are involved in the transport, use and disposal of hazardous waste. However, businesses that are involved in the transport, use and/or disposal of hazardous waste are required to submit a business plan to the HMD of the San Bernardino County Fire Department.

GP Impact 5.6-2 The Norton AFB and the Newmark Groundwater Contamination site are listed on the NPL. Much of the extent of the contamination is within the Groundwater Basin however the City of San Bernardino Municipal Water Department operates wellhead treatment systems to ensure the safety of the water supply for San Bernardino residents. The CERCLIS list also identified 6 other sites within the City with hazardous waste contamination. While many of these sites do not have a remediation plan, the existing federal and state environmental regulations in place prevent the reuse of the site without standards for cleanup under CERCLIS, and in some cases RCRA.

GP Impact 5.6-3 The San Bernardino International Airport is located within the City of San Bernardino. The Airport Influence Area was adopted by the SBIA and is incorporated in the General Plan update.

GP Impact 5.6-4 Implementation of the City of San Bernardino General Plan would not interfere with the implementation of this emergency response plan or evacuation route.

GP Impact 5.6-5 The north portions of the City of San Bernardino are located in areas designated as an extreme or moderate fire hazard zone. Placement of structures, including residential and commercial, could place these structures and their occupants at risk. However, the Foothills Fire Zone Overlay District places additional restriction on new development to ensure safety of existing and future residents within this extreme hazard area.

5.6.5.2 Arrowhead Springs

Upon implementation of regulatory requirements, and standard conditions of approval, the following impacts would be less than significant:

AHS Impact 5.6-2 The Arrowhead Springs Specific Plan area is not located on a list of sites containing hazardous waste.

AHS Impact 5.6-3 The Arrowhead Springs Specific Plan area is not located within the vicinity of a private of public airport.

AHS Impact 5.6-4 The Arrowhead Springs Specific Plan is located in a remote area. Implementation of the Arrowhead Springs Specific Plan would result in intensification of uses which may result in an impact to the City's emergency response plan or evacuation route. However, the Arrowhead Springs Specific Plan circulation system was developed in consultation with the City of San Bernardino Fire Department to ensure adequate emergency access.

AHS Impact 5.6-5 The Arrowhead Springs Specific Plan area is located in an area designated as an extreme fire hazard zone. Placement of structures, including residential and commercial, could place these structures and their occupants at risk. However, the Foothills Fire Zone Overlay District places additional restriction on new development to ensure safety of existing and future residents within this extreme hazard area.

Without mitigation, the following impacts would be **significant:**

AHS Impact 5.6-1 The Arrowhead Springs Specific Plan area would result in the expansion of the existing development to include new commercial and residential uses. The Phase I Site Assessment identified recognized environmental conditions and historical recognized environmental conditions that may pose a hazard to people or the environment. Furthermore, naturally occurring emissions from the geothermal activity may also pose a hazard to people if development were to be concentrated in these areas.

5.6.6 Mitigation Measures

5.6.6.1 San Bernardino General Plan Update

No significant impacts were identified and no mitigation measures are necessary.

5.6.6.2 Arrowhead Springs

AHS 5.6-1a Oil impacted materials identified onsite shall be properly cleaned and disposed of in accordance state and local laws.

AHS 5.6-1b Soil samples shall be collected in the area surrounding the drying beds at the small sanitary sewer treatment facility and shall be tested for elevated metal concentrations.

AHS 5.6-1c Prior to approval of Tentative Tract Maps in the Arrowhead Springs Specific Plan area in the vicinity of the identified geothermal areas, the developer shall initiate a risk assessment to identify possible risks associated with the development adjacent to the geothermal activity of Arrowhead Springs. The risk analysis shall include a risk assessment of radon, methane, propane, and mercury associated with the geothermal vents, hot springs, and mercury accumulation in the soils where development is to occur. Ventilation systems shall be designed in accordance with the National Fire Protection Association guide to ensure that indoor air concentrations of these hazards associated with the geothermal activity would not result in a hazard for building occupants. If an active (i.e. mechanically operated) ventilation system is used, the developer would be required to obtain relevant permits from the AQMD.

5.6.7 Level of Significance After Mitigation

The mitigation measures identified above would reduce potential impacts associated with hazards to a level that is less than significant. Therefore, no significant unavoidable adverse impacts relating hazards and hazardous materials have been identified.

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5.7 HYDROLOGY AND WATER QUALITY

This section of the EIR evaluates the potential for implementation of both the General Plan Update and the Arrowhead Springs Specific Plan to impact the hydrology and water quality conditions in the City of San Bernardino and within the Arrowhead Springs Specific Plan area. Hydrology deals with the distribution and circulation of water, both on land and underground. Water quality deals with the quality of surface and groundwater. Surface water is water on the surface of the land and includes lakes, rivers, streams, and creeks. Groundwater is water below the surface of the earth. Water supply and wastewater treatment issues are addressed in Section 5.15, *Utilities and Service Systems*.

The methodology used to prepare this section of the EIR included a review of information on water quality, flooding, seiche and dam inundation hazards, and regulatory background as well as the preliminary Drainage Study of the Arrowhead Springs project prepared by Transtech, Inc. The complete Drainage Study is available in Volume III, Appendix F of the EIR. Current website information and pertinent documents from the City of San Bernardino as well as other appropriate agencies was also used in preparation of this section including the Water Quality Control Plan for the Santa Ana River. These agencies include the Southern California Association of Governments (SCAG), U.S. Environmental Protection Agency (EPA), Santa Ana Regional Water Quality Control Board, and the City of San Bernardino Municipal Water District.

5.7.1 Environmental Setting

Regulatory Background

Safe Drinking Water Act

The Federal Safe Drinking Water Act (SDWA) provides regulations on drinking water quality in San Bernardino. The SDWA gives the EPA the authority to set drinking water standards, such as the National Primary Drinking Water regulations (NPDWRs or primary standards). The NPDWRs protect drinking water quality by limiting the levels of specific contaminants that are known to occur or have the potential to occur in water and can adversely affect public health. All public water systems that provide service to 25 or more individuals are required to satisfy these legally enforceable standards. Water purveyors must monitor for these contaminants on fixed schedules and report to the EPA when a Maximum Contaminant Level (MCL) has been exceeded. MCL is the maximum permissible level of a contaminant in water that is delivered to any user of a public water system. Drinking water supplies are tested for a variety of contaminants, including organic and inorganic chemicals (e.g., minerals), substances that are known to cause cancer (e.g., carcinogens), radionuclide (e.g., uranium and radon), and microbial contaminants (e.g., coliform and Escherichia coli). Changes to the MCL list are typically made every three years, as the EPA adds new contaminants or, based on new research or new case studies, revised MCLs for some contaminants are issued. The California Department of Health Services, Division of Drinking Water and Environmental Management is responsible for implementation of the Safe Drinking Water Act in the State of California.

Clean Water Act

The Clean Water Act (CWA) established the basic structure for regulating discharges of pollutants into the waters of the United States and gives the EPA the authority to implement pollution control programs, such as setting wastewater standards for industry. The CWA also continued requirements to set water quality standards for all contaminants in surface waters and made it unlawful for any person to discharge any pollutant from a point source into navigable waters, unless a permit was obtained under its provisions (see discussion on the NPDES below). The CWA also funded the construction of sewage treatment plants and recognized the need for planning to address non-point sources of pollution. The CWA is regulated through the State/Regional Water Quality control Boards.

National Pollutant Discharge Elimination System

Under the National Pollutant Discharge Elimination System (NPDES), all facilities that discharge pollutants from any point source into waters of the United States are required to obtain an NPDES permit. The term pollutant broadly includes any type of industrial, municipal, and agricultural waste discharged into water. Point sources are discharges from publicly owned treatment works (POTWs), discharges from industrial facilities, and discharges associated with urban runoff. While the NPDES program addresses certain specific types of agricultural activities, the majority of agricultural facilities are defined as non-point sources and are exempt from NPDES regulation. Pollutant contributors come from direct and indirect sources. Direct sources discharge directly to receiving waters, whereas indirect sources discharge wastewater to a POTW, which in turn discharges to receiving waters. Under the national program, NPDES permits are issued only to direct point source dischargers. Municipal sources are POTWs that receive primarily domestic sewage from residential and commercial customers. Specific NPDES program areas applicable to municipal sources are the National Pretreatment Program, the Municipal Sewage Sludge Program, Combined Sewer Overflows (CSOs), and the Municipal Storm Water Program. Non-municipal sources include industrial and commercial facilities. Specific NPDES program areas applicable to industrial sources are: Process Wastewater Discharges, Non-process Wastewater Discharges, and the Industrial Storm Water Program. NPDES issues two basic permit types: individual and general. Also, the EPA has focused on integrating the NPDES program further into watershed planning and permitting.

The NPDES has a variety of measures designed to minimize and reduce pollutant discharges. All counties with a storm drain system that serve a population of 50,000 or more, as well as construction sites one acre or more in size, must file for and obtain an NPDES permit. The Santa Ana RWQCB has issued an individual NPDES municipal storm water (MS4) permit for San Bernardino County. The City of San Bernardino is listed as a participating co-permittee of the County NPDES permit and the Public Works Department is the local enforcing agency of the NPDES within the City. Another measure is the EPA's Storm Water Phase II Final Rule. The Phase II Final Rule requires an operator of a regulated small MS4 to develop, implement, and enforce a program (e.g., Best Management Practices, ordinance or other mechanism) to reduce pollutants in post-construction runoff to their MS4 from new development and redevelopment projects that result in the land disturbance of greater than or equal to one acre.

Plans and Programs

Water Quality Control Plan

In the State of California, the State Water Resources Control Board (SWRCB) and the nine RWQCBs are responsible for implementing the California Porter-Cologne Quality Control Act (California Water Code), which regulates water quality. The Water Quality Control Plan for the Santa Ana River Basin (Basin Plan) gives direction on the beneficial uses of the state waters within Region 8, describes the water quality that must be maintained to support such uses, and provides programs, projects, and other actions necessary to achieve the standards established in the Basin Plan. The Santa Ana River RWQCB implements the Basin Plan by issuing and enforcing waste discharge requirements to persons, such as individuals, communities, or businesses whose waste discharges may affect water quality. These requirements are state Waste Discharge Requirements for discharge to land, or federally delegated NPDES permits for discharges to surface water. The Basin Plan is subject to continuous review and update as necessary.

National Flood Insurance Program

The National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973 mandates FEMA to evaluate flood hazards. FEMA provides Flood Insurance Rate Maps (FIRMs) for local and regional planners to promote sound land use and floodplain development. FIRMs only identify potential flood areas based on the conditions at the time of the study and do not consider the impacts of future development.

To prepare FIRMs that illustrate the extend of flood hazards in a flood-prone community, FEMA conducts engineering studies referred to as Flood Insurance Studies (FISs). Using information gathered in these studies, FEMA engineers and cartographers delineate Special Flood Hazard Areas (SFHAs) on FIRMs. SFHAs are those areas subject to inundation by a base flood, which FEMA sets as a 100-year flood. The 100-year recurrence interval represents only the long-term average period between floods of a specific magnitude. Rare floods can in fact occur at much shorter intervals or even within the same year. The 500-year flood is used to indicate additional areas of flood risk in the community.

The base flood is a regulatory standard used by the National Flood Insurance Program (NIFP) as the basis for insurance requirements nationwide. The Flood Disaster Protection Act requires owners of all structures in identified SFHAs to purchase and maintain flood insurance as a condition of receiving Federal or federally related financial assistance, such as mortgage loans from federally insured lending institutions.

The base flood is also used by Federal agencies, as well as most county and State agencies to administer floodplain management programs. The goals of floodplain management are to reduce losses caused by floods while protecting the natural resources and functions of the floodplain. The basis of floodplain management is the concept of the floodway. FEMA defines this as the channel of a river or other watercourse, and the adjacent land areas that must be kept free of encroachment in order to discharge the base flood without cumulatively increasing the water surface elevation more than a certain height. The intention is not to preclude development, but to assist communities in managing sound development in areas of potential flooding. The community is responsible for prohibiting encroachments into the floodway unless it is demonstrated by detailed hydrologic and hydraulic analyses that the proposed development will not increase the flood levels downstream.

The NFIP is required to offer federally subsidized flood insurance to property owners in those communities that adopt and enforce floodplain management ordinances that meet minimum criteria established by FEMA. The National Flood Insurance Reform Act of 1994 further strengthened the NFIP by providing a grant program for State and community flood mitigation projects. The Act also established the Community Rating System (CRS), a system for crediting communities that implement measures to protect the natural and beneficial functions of their floodplains, as well as managing the erosion hazard.

The City of San Bernardino has participated as a regular member of the NFIP since July 16, 1979. The City's most current effective FIRM maps are dated January 17, 1997.

Since the City is a participating ember of the NFIP, flood insurance is available to any property owner in the City. In fact, to get secured financing to buy, build, or improve structures in SFHAs, property owners are required to purchase flood insurance. Lending institutions that are federally regulated or federally insured must determine if the structure is located in a SFHA and must provide written notice requiring flood insurance. FEMA recommends that all property owners purchase and keep flood insurance.

5.7.1.1 San Bernardino General Plan Update

Existing Conditions Related to Surface Water

Existing Regional Drainage System

The City of San Bernardino lies within the Santa Ana River Basin (Region 8) of the Regional Water Quality Control Board. Region 8 extends from the San Bernardino and San Gabriel Mountains in the north and east to Newport Bay along the coast. This Santa Ana River Basin is geographically the smallest region, at 2,800 square miles, yet contains one of the largest populations with almost five million people. The region contains 460 miles of streams, 21,090 acres of lakes and 24 miles of coastline.

The Santa Ana River is the largest stream system in southern California, and is also the region's main surface water body. The Santa Ana River transports more than 125 million gallons per day of reclaimed water from Riverside and San Bernardino Counties for recharge into the Orange County Groundwater Basin. This recharge provides 40 percent of the Orange County water demand.

The Santa Ana River has a number of tributaries in the vicinity of San Bernardino that contribute flow to the main stem of the river including Lytle Creek, East Twin Creek, East Warm Creek and San Timoteo Creek.

In the San Bernardino Area, the San Jacinto Fault (Bunker Hill Dike) forces groundwater to the surface. At present, perennial flows in the middle Santa Ana River begin at the confluence with East Warm Creek, a short distance upstream. The rising water area associated with the fault, now relatively small, was historically a much larger swampy area with many large springs. San Timoteo Creek, which the Corps of Engineers plans to line with concrete in the near future, joins the river in this area, and its flows are predominantly reclaimed wastewater from Yucaipa and other upstream dischargers.

East Warm Creek near San Bernardino carries small amounts of water from various non-point sources as well as some rising water. The City of San Bernardino publicly-owned wastewater treatment plant currently discharges to this creek just upstream of where it joins the Santa Ana River, but the City plans to move its point of discharge downstream in the near future. The river passes under several major highways and railroads in this area, and parts of the river bottom are lined with concrete. West Warm Creek, fully improved by the USCOE for flood control (but is usually dry), also joins the river in this area.

The main stem of the Santa Ana River is divided into six reaches. Each reach is generally a hydrologic and water quality unit described as follows:

Reach 6 includes the river upstream of Seven Oaks Dam, now under construction. Flows consist largely of snowmelt and storm runoff. Water quality tends to be very high.

Reach 5 extends from Seven Oaks dam to San Bernardino, to the San Jacinto Fault, which marks the downstream edge of the Bunker Hill Groundwater Basin. Most of this reach tends to be dry, except as a result of storm flows, and the channel is largely operated as a flood control facility. The extreme lower end of this reach includes rising water and intermittently, San Timoteo Creek flows. Stormwater run-off from the City of San Bernardino would primarily discharge into the lower end of this reach.

Beneficial uses of water in the reach have been determined to be Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Groundwater Recharge (GWR), Hydropower Generation (POW), Water Contact Recreation (REC1), Non-contact Water Recreation (REC2), Warm Freshwater Habitat (WARM), Wildlife Habitat (WILD), and Rare, Threatened and Endangered Species (RARE). The beneficial use classifications help define and establish water quality standards which are detailed in the *Water Quality Control Plan* for the Santa Ana River Basin.

Reach 4 includes the river from the Bunker Hill Dike down to Mission Boulevard Bridge in Riverside. That bridge marks the upstream limit of rising water induced by the flow constriction in the Riverside Narrows. Until about 1985, rising water from upstream and wastewater discharges percolated and the lower part of the reach was dry. Flows are now perennial, but may not remain so as new projects are built. Much of this reach is also operated as a flood control facility.

Reach 3 includes the river from Mission Bridge to Prado Dam. In the Narrows, rising water reeds several small tributaries (Sunnyslope Channel, Tequesquite Arroyo, and Anza Park Drain) which are important breeding and nursery areas for the native fish. Temescal, Chino, and Mill/Cucamonga Creeks in Prado Basin are also important river tributaries.

Reach 2 carries all the upstream flows down through Santa Ana Canyon to Orange County, where as much of the water as possible is recharged into the Orange County groundwater basin. The downstream end of the forebay/recharge area and, therefore, the ordinary limit of surface flows, are at 17th Street in Santa Ana.

Reach 1 is normally dry flood control facility, presently being expanded and improved even further as part of the USCOE Santa Ana River Project. This reach extends from 17th Street to the tidal prism at the ocean.

The primary water quality issue for the Santa Ana River watershed is degradation due to high concentrations of nitrogen (primarily from past agricultural practices) and total Dissolved Solids (TDS).

Existing Local Drainage System

Storm drains and flood control facilities within the planning area include natural and man-made channels, storm drains, street waterways, natural drainage courses, dams, basins, and levees. Storm drain and flood control facilities are administered by City of San Bernardino, San Bernardino County Flood Control District, Army Corps of Engineers, and San Bernardino International Airport and Trade Center. Design and construction of storm drain and flood control facilities are the responsibility of the City Public Works Department. The Public Services Department is responsible for the operation and maintenance of storm drain and flood control facilities. San Bernardino's planning area encompasses 71 square miles, much of which is paved and impervious to stormwater.

The San Bernardino County Flood Control District divides the City into subareas for planning purposes pursuant to the District's Comprehensive Storm Drain Plans No. 3, 4, 6, and 7. The City uses the Flood Control District's Comprehensive Storm Drain Plans for the development of the City's storm drain system. The City of San Bernardino requires all 10-year frequency storm waters, except for street flows at intersection points, be contained in the underground drain system. Storm flows in excess of the 10-year frequency storm flow, but less than or equal to the 25-year storm flow, will be carried in the curbed portion of the street. Storm flows associated with 100-year storms may be carried in the street right-of-way. One-hundred-year storm flows may also be conveyed via a combination of storm drains sized to convey a 25-year storm in the curbed part of the street with the balance of the flow conveyed in the street section.

The City of San Bernardino has established design criteria for both major and local drains within the City. Major drains are systems using 36-inch or larger pipes (or equivalent channels) and are identified on the comprehensive storm drain plans. Local drains are systems using less than 36-inch-diameter conduits. Storm drains and flood control facilities within the City include: channels, storm drains, street waterways, natural drainage courses, dams, basins, and levees. Some streets in the City of San Bernardino are specifically designed to accommodate storm flow. Flows carried within the street right-of-way may cause localized flooding during storms, possibly making some roads impassable during the storm event.

Flooding Hazards

San Bernardino, like most of southern California, is subject to unpredictable seasonal rainfall. Most years, winter rains are scant. However, every few years the region is subjected to periods of intense and sustained precipitation that result in flooding. Floods are natural and recurring events that become hazardous when humans encroach onto floodplains modifying the landscape, increasing the amount of impervious surfaces, and building structures in area meant to convey excess water during floods.

As part of the NFIP, Flood Insurance Rate Maps (FIRMs) have been prepared which contain official delineation of flood insurance zones and base flood elevation lines. FEMA periodically updates and refines these maps. The 100-year floodplain is confined to storm channels, debris basins, and between levees with a few minor exceptions. A few isolated areas, including the Baseline Street and Sterling Avenue area, Mountain View Avenue and Electric Avenue area, and south of Redlands Boulevard, east of Hunts Lane, are identified as low areas within the 100-year floodplain. The 100-year flood plain is illustrated in Figure 5.7-1.

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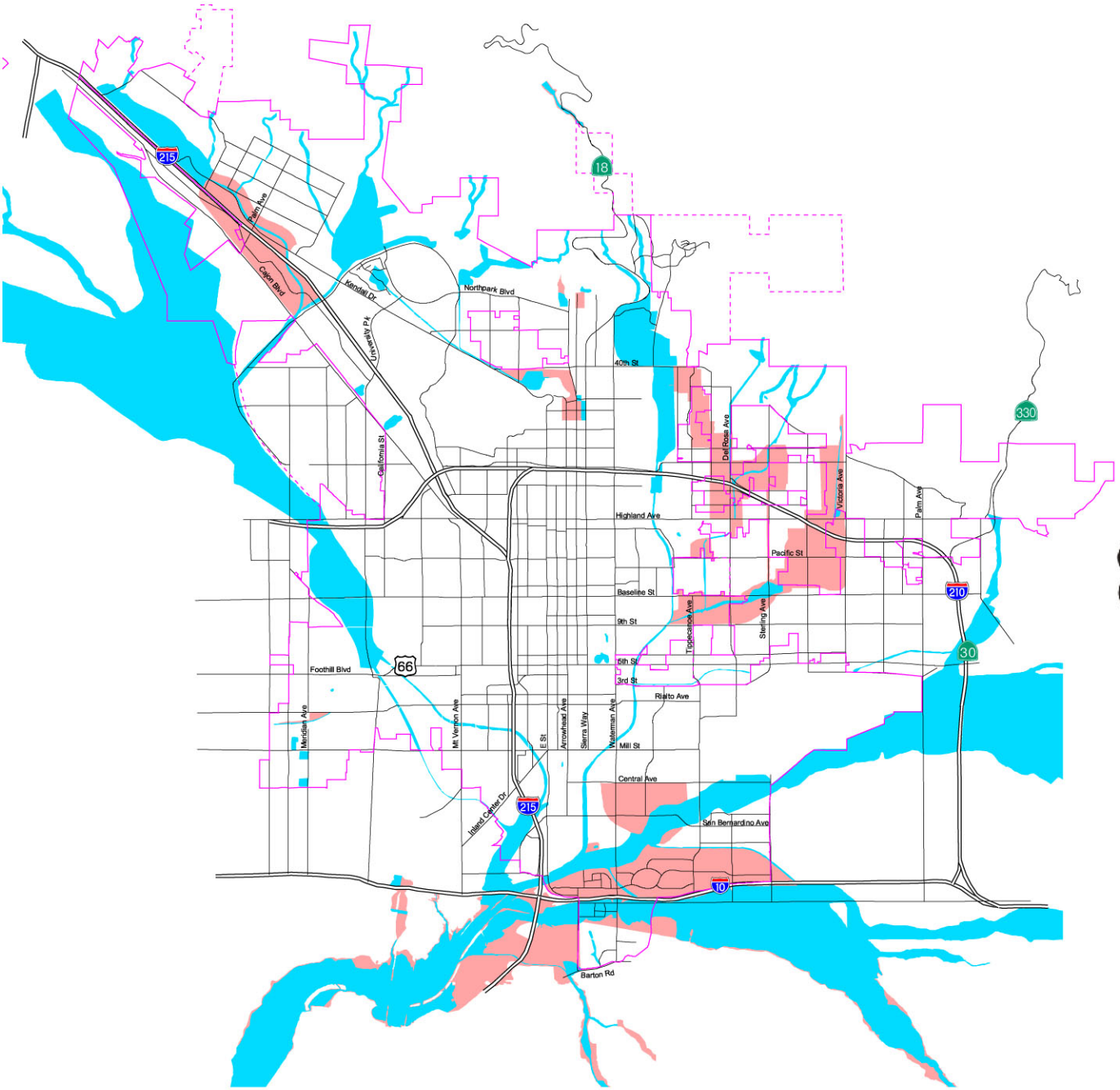
100-Year Flood Plain



100-Year Flood Zone

500-Year Flood Zone

City Boundary

Sphere of Influence Boundary

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Storms are not the only cause of flooding within the City. Basements and underground utility vaults may also experience flooding in areas between the Santa Ana River and downtown due to the City's existing high groundwater table (find additional discussion of naturally occurring springs in Section 5.5, *Geology and Soils*).

The Santa Ana River Mainstem Project was designed to provide flood protection to the growing urban communities in Orange, Riverside and San Bernardino Counties. The proposed improvements the system cover 75 miles, from the headwaters of Santa Ana River east of San Bernardino to the mouth of the Pacific Ocean between the cities of Newport Beach and Huntington Beach. The project increases levels of flood protection to more than 3.35 million people within the three counties. The project includes seven independent features, including Seven Oaks Dam, Mill Creek Levee, San Timoteo Creek, Oak Street Drain, Prado Dam, Santiago Creek, and Lower Santa Ana River.

Dam Inundation

Seismically induced inundation refers to flooding that occurs when water retention structures (e.g., dams) fail due to an earthquake. The California State Water Code contains statutes governing dam safety. These statutes empower the California Division of Dam Safety to monitor the structural safety of dams that are greater than 25 feet in dam height or have more than 50 acre-feet in storage capacity.

Seven Oaks Dam is a single purpose flood control project constructed by the USCOE. The dam is located on the Santa Ana River in the upper Santa Ana Canyon eight miles northeast of the City of Redlands, which borders the City of San Bernardino to the southeast. The dam is of earth and rock filled construction, is 550 feet in height and 2,600 feet wide.

The Dam operates in tandem with Prado Dam to provide flood protection to the region. During the early part of each flood season, runoff is stored behind the dam in order to build a debris pool to protect the outlet works. Small releases are made on a continual basis in order to maintain the downstream water supply. The dam is designed to provide 350-year flood protection and withstand an earthquake of 8-plus magnitude. During flood conditions, it creates a lake 500 feet deep extending three miles back into the canyon. In the unlikely event of dam failure an inundation zone for the Seven Oaks Dam has been determined as shown on Figure 5.7-2. The southeastern portion of the City would be affected.

Inundation from Aboveground Water Storage Reservoirs

Seismically induced inundation can also occur if strong ground shaking causes structural damage to aboveground water storage reservoirs. If a water tank is not adequately braced and baffled, sloshing water can lift the tank off its foundation, splitting the shell, damaging the roof, and bulging the bottom of the tank. Movement can also shear off the pipes leading to the tank releasing water through the broken pipes. These types of damage occurred during southern California's 1992 Landers, 1992 Big Bear, and 1994 Northridge earthquakes. New standards for design of steel water tanks were adopted in 1994.

Seiches

A seiche is a free or standing-wave oscillation of the surface of water in an enclosed or semi-enclosed basin, such as a lake, bay, harbor, pond, reservoir, swimming pool, and other body of water that is initiated chiefly by local changes in atmospheric pressure, aided by winds, tidal currents, and earthquakes, and that continues, pendulum-fashion, for a time after cessation of the originating force. The hazard is dependent upon specific earthquake parameters (e.g., frequency of the seismic waves, distance and direction from the epicenter), as well as site-specific design of the enclosed bodies of water, and is thus difficult to predict. Developments with homes near man-made lakes may be vulnerable to this hazard. Sloshing within steel water tanks can cause damage or failure of the structure. Minor seiching in swimming pools can also occur.

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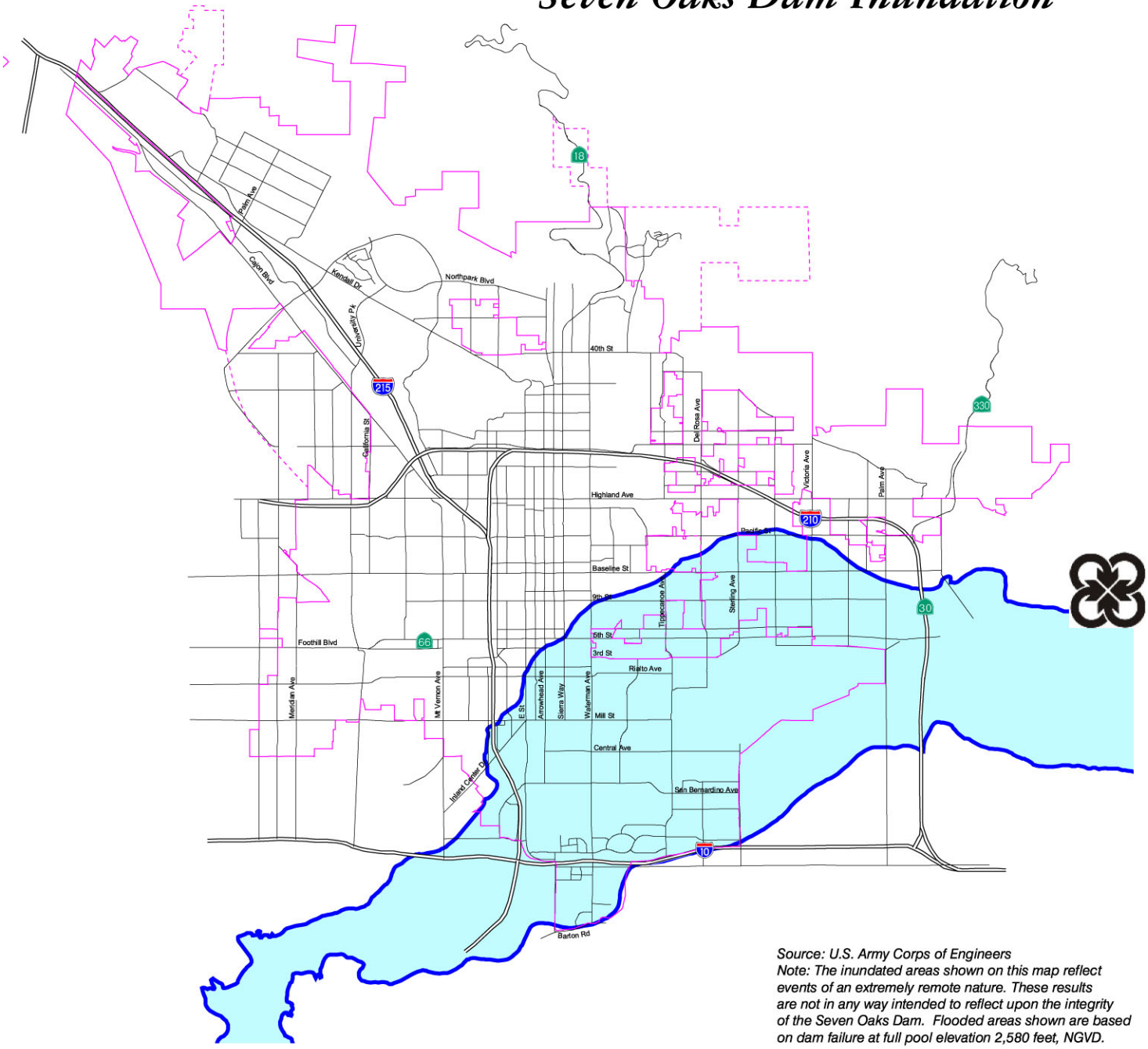
Seven Oaks Dam Inundation



Source: U.S. Army Corps of Engineers
Note: The inundated areas shown on this map reflect events of an extremely remote nature. These results are not in any way intended to reflect upon the integrity of the Seven Oaks Dam. Flooded areas shown are based on dam failure at full pool elevation 2,580 feet, NGVD.

Limit of Flooded Area with Dam Failure

City Boundary

Sphere of Influence Boundary

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Mudflows and Debris Flows

A mudflow is a mass of water and fine-grained earth materials that flows down a stream, ravine, canyon, arroyo, or gulch. If more than half of the solids in the mass are larger than sand grains (e.g., rocks, stones, boulders), then the event is called a debris flow. Debris and mudflows are a combination of fast moving water and a great volume of sediment and debris that surges down slope with tremendous force. They are similar to flash floods and can occur suddenly without time for adequate warning. Most streams in the San Bernardino area have the potential to carry large amounts of debris, or debris flow. Mudflows may also occur near hills and mountains. Development at the base of the mountains and downstream from canyons has the potential to convey mudflows.

Existing Conditions Related to Groundwater

Groundwater Supply

Groundwater is water that is found below the ground surface in water bearing formations called aquifers. An aquifer is a geologic formation that is sufficiently permeable to conduct groundwater, and to yield significant quantities of water to wells and springs. Perched ground water is a body of water located above a permanent groundwater zone and separated from it by a soil or bedrock zone of low permeability.

Groundwater basins are areas with highly permeable soils that allow for the replenishment of the aquifers. These basins are usually located along streambeds and in alluvial fans where permeable soils are generally found. The quantity of groundwater found in an aquifer is dependent upon the specific geologic and hydrologic conditions in an area. Most of the readily extractable groundwater is obtained from aquifers consisting of recent alluvium, with smaller quantities of groundwater found in jointed bedrock and residuum.

Extensive groundwater basins underlie much of the San Bernardino region. San Bernardino overlies the Upper Santa Ana Valley Groundwater Basin, Bunker Hill Subbasin. The Bunker Hill Basin consists of the alluvial materials that underlie the San Bernardino Valley. This Basin is bounded by contact with consolidated rocks of the San Gabriel Mountains, San Bernardino Mountains, Crafton Hills, and by several faults. The Santa Ana River, Mill Creek and Lytle Creek are the main tributary streams in the Basin.

The Basin is filled from rain and snow melt that filters down through the San Bernardino Mountains.[1] Recharge to the Bunker Hill Basin historically has resulted from infiltration of runoff from the San Gabriel and San Bernardino Mountains. The Santa Ana River, Mill Creek and Lytle Creek contribute more than 60 percent of the total recharge to the ground-water system. Lesser contributors include Cajon Creek, San Timoteo Creek, and most of the creeks flowing southward out of the San Bernardino Mountains such as East Twin Creek. Total groundwater storage of the Basin is 5,976,000 acre-feet,[2] while as of 1998 the total amount of water in the Basin was 5,890,300 acre-feet.

The water-bearing material in the Basin consists of Holocene and Pleistocene age alluvial deposits of sand, gravel, and boulders interspersed with deposits of silt and clay. The water-bearing material has been divided into upper and lower aquifers. In the central part of the Basin, a poorly permeable clay layer separates the aquifers, creating confined conditions in the lower aquifer under about 25 square miles of the valley. Maximum thickness of the upper aquifer is approximately 350 feet, and maximum thickness of the lower aquifer is approximately 650 feet. Groundwater generally converges toward the Santa Ana River in the southwestern part of the Basin and discharges over the San Jacinto fault at Colton Narrows.

[1] City of San Bernardino Municipal Water Department, Urban Water Management Plan Update for the planning period 2000–2020, January 2002.

[2] California's Groundwater Bulletin 118, February 27, 2004

San Bernardino gets one hundred percent of its water from the Bunker Hill Basin. San Bernardino Municipal Water Department owns a total of 60 wells in the basin, some as much as 1,200 foot deep, that tap into the aquifer. Portions of the Bunker Hill Basin, however, have been contaminated by certain chemical constituents as discussed in Section 5.6, *Hazards and Hazardous Materials*. For additional discussion of water supply, please see Section 5.15, *Utilities*.

5.7.1.2 Arrowhead Springs Specific Plan

Existing Conditions Related to Surface Water

Existing Drainage System

Arrowhead Springs is located within the West Twin Creek (Waterman Canyon) and East Twin Creek watersheds, as shown in Figure 5.7-3, *Arrowhead Springs Drainage Map*. Both of these watersheds extend well beyond to the north and east of the Arrowhead Springs property. There are three primary water courses that flow through the Arrowhead Springs property, with a peak flow of over seven million gallons of water per day passing through the Arrowhead Springs Specific Plan area. East Twin Creek out of Coldwater Canyon, Strawberry Creek, and West Twin Creek, which flows through Waterman Canyon, compose the major waterways. Each has numerous contributing un-named tributaries. Strawberry Creek joins East Twin Creek near the eastern edge of the currently developed resort facilities. East Twin Creek and West Twin Creek converge south of the property, where flows continue south toward 40th Street through the County of San Bernardino Flood Control District percolation basins. Drainage then continues in a southerly direction through the City along improved drainage channels, ultimately discharging into the Santa Ana River (see Figure 3.1-2 for relationship to regional water systems). In addition, there are several locations where hot thermal springs and cold springs spill out onto the ground due to the unique geology of the area which is described in greater detail in Section 5.5, *Geology and Soils*, of this EIR. Known springs are named Granite Springs, Penyugal Springs, the Steam Caves, and another abandoned hot spring exists near West Twin Creek.

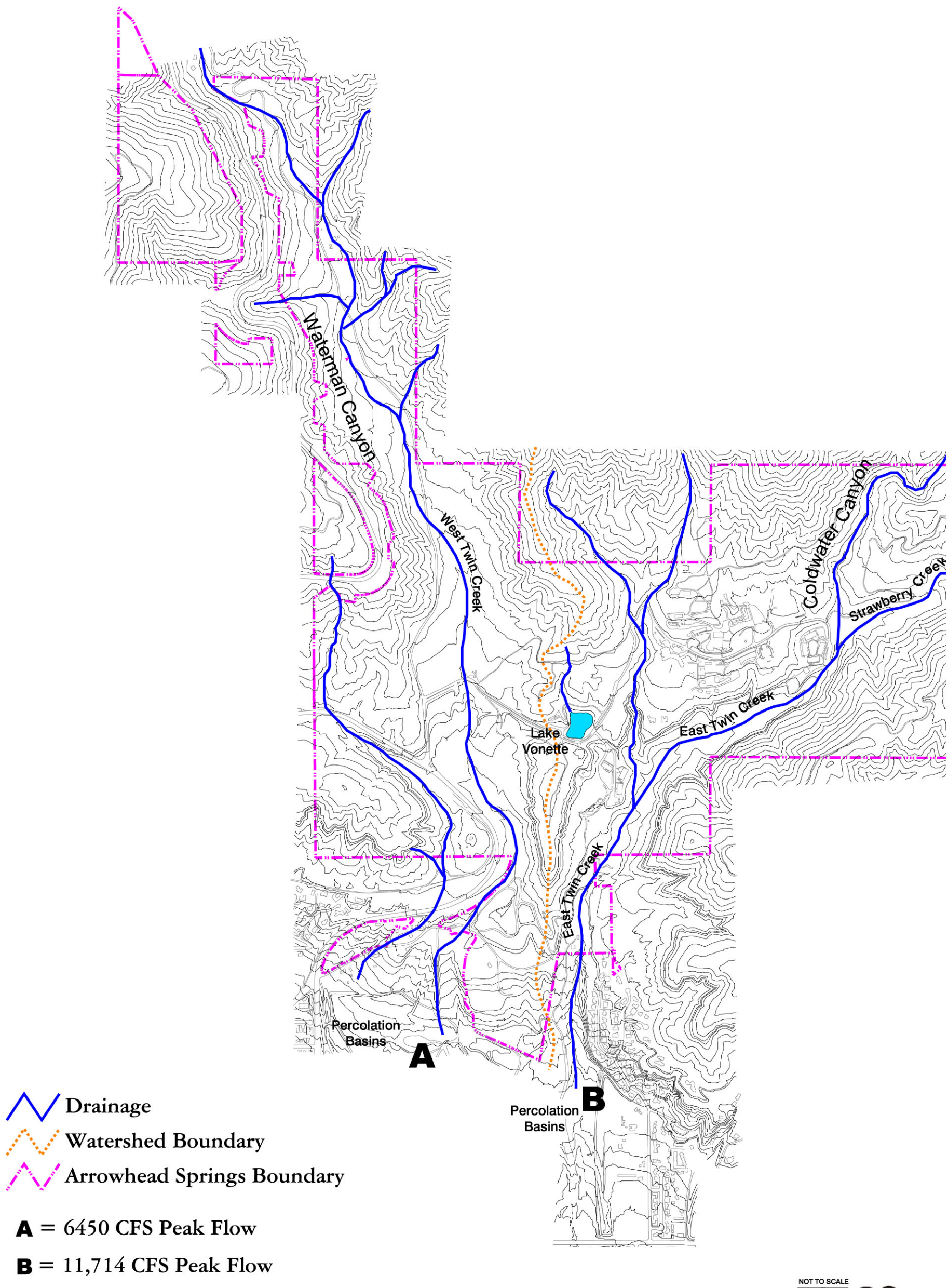
The developed area of the Arrowhead Springs property has a limited stormwater collection system that consists of a combination of either curbed roads and/or gutters (water ways) that direct stormwater to an underground piping system that discharges to either Lake Vonette, East Twin or West Twin Creek, or an unnamed tributary west of the hotel sometimes referred to as Hot Springs Creek. Smaller roadways (local streets) direct run-off into landscaped areas.

The Metropolitan Water District of Southern California (MWD) is finishing construction of a pipeline (the Inland Feeder Project) across West Twin Creek and East Twin Creek for delivery of State Water to southern California. This construction has disturbed the natural conditions of these two drainages which can be seen in the photos in Figure 5.1-5 (in the *Aesthetics* section) and planned restoration has not been implemented at this time.

East Twin Creek Watershed

The East Twin Creek Watershed includes the drainages of Strawberry Creek, Coldwater Canyon (source of East Twin Creek) and unnamed streams contributing to East Twin Creek. The over 1,100 acres of this watershed is within the eastern portion of the Arrowhead Springs Specific Plan area. The balance of the watershed is within U.S. Forest Service property to the east and north of the Arrowhead Springs property without human occupancy.

Arrowhead Springs Area Drainage



Source: USGS Topographic Quadrangles, NRA, Inc.

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Water had been diverted from Coldwater Canyon for many years to provide the domestic water for the hotels and out-buildings currently existing on the project site. Use of that water as a source of drinking water has been discontinued; however the water is still used for irrigation purposes. Water gage records show that water from Coldwater Canyon maintains a minimum continuous flow of 0.5 million gallons per day. Water from the East Twin Creek watershed varies during the year with highest flows during the winter months.

The Santa Ana River Basin *Water Quality Control Plan* of 1995 included the East Twin Creek watershed as contributing to the Santa Ana River and thus determined beneficial uses for these streams. Those beneficial uses are MUN, AGR, GWR, REC1, REC2, Cold Freshwater Habitat (COLD), WILD, and Spawning, Reproduction and Development (SPWN), which are waters that support high quality aquatic habitat. Only one water quality objective for TSD has been established for this watershed of 475 milligrams per liter (mg/L).

West Twin Creek Watershed

The West Twin Creek watershed including Waterman Canyon runs north-south through the western edge of the property, roughly parallel to SR-18 and extends more than a mile to the north of the Arrowhead Springs property. Throughout this watershed and in close proximity to West Twin Creek are a number of residences that rely on septic systems, which makes this watershed an undesirable source of drinking water. Additionally Waterman Canyon has experienced periodic rapid flooding conditions that produce considerable turbidity.

Beneficial uses of the West Twin Creek watershed (Waterman Canyon Creek) were determined to be MUN, GWR, REC1, REC2, COLD and WILD. The TSD level established for West Twin Creek was 250 mg/L.

Flooding Hazards

A specific 100-year floodplain elevation has not been determined for all of East and West Twin Creeks within the Arrowhead Springs Specific Plan area; however, the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) depicts the flood plain boundaries to the north and south of the major portions of the project site. There are a limited number of residences in Waterman Canyon, just outside the Specific Plan boundary, that have experienced periodic flooding or threat of flooding. Potential “waters of the U.S.” as determined by Natural Resources Assessment, Inc., as part of the biological resources assessment of the Arrowhead Springs property, are shown in Figure 5.3-4. This determination of “waters of the U.S.” may not necessarily show the extent of the 100-year floodplain, but does given an indication that water can spread from side to side of the creek canyons, especially Waterman Canyon.

Existing Water Rights

The West Twin Creek Mutual Water Company and the Del Rosa Mutual Water Company provide water for domestic and/or irrigation water through either on-site wells or withdrawal from East or West Twin Creeks. These mutual water companies have long standing water rights from these streams that are discussed in Section 5.15.1, *Water Supply and Distribution,* and in Volume III, Appendix I. According to the Water Supply Assessment in Appendix I, the recorded average annual production from on-site wells is 81.93 acre-feet for domestic water supplies and an average of 1,733.33 acre-feet of water is withdrawn annually from streams for irrigation.

Existing Conditions Related to Groundwater

The southern portion of Arrowhead Springs Specific Plan area is generally located within northernmost part of the Bunker Hill (groundwater) Sub-basin, which is thought to extend as far north as the San Andreas Fault. This basin has been described above in Section 5.7.1.1. The Del Rosa Mutual Water Company has an existing service area that encompasses parts of the Bunker Hill Sub-basin and has retrieved water from wells

in the Basin in the past through shares held in the company by the City of San Bernardino, but no water is currently withdrawn in the basin and the City no longer owns shares in the company.

Four on-site wells (Rod's Well, Football Filed Well, Rowan Well and Strawberry Creek Well) supply the average total 81.93 acre-feet of water that is withdrawn for drinking water. These wells are relatively shallow, according to the Water Supply Assessment, and are very low producers but are sufficient for present needs. Two hot geothermal wells supply an average of 28.57 acre-feet of water per year that is primarily used for heating of on-site structures.

5.7.2 Thresholds of Significance

According to Appendix G of the CEQA Guidelines, a project would normally have a significant effect on the environment if the project would:

HD-1 Violate any water quality standards or waste discharge requirements.

HD-2 Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted.

HD-3 Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in a substantial erosion or siltation on- or off-site.

HD-4 Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site.

HD-5 Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff.

HD-6 Otherwise substantially degrade water quality.

HD-7 Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map.

HD-8 Place within a 100-year flood hazard area structures which would impede or redirect flood flows.

HD-9 Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam.

HD-10 Be subject to inundation by seiche, tsunami, or mudflow.

5.7.3 Environmental Impacts

5.7.3.1 San Bernardino General Plan Update

The General Plan Update involves a minimal number of changes to existing land uses in San Bernardino and its SOI with most changes reflecting the existing uses. The primarily focus of the update was to streamline and simplify the document and update goals and policies to reflect actions already taken and include contemporary laws and information. An analysis of the project impacts, as they relate to hydrology and water quality in the San Bernardino area, is provided in this section of the EIR.

The following impact analysis addresses thresholds of significance for which the Initial Study disclosed potentially significant impacts. The applicable thresholds are identified in parentheses after the impact statement.

GP IMPACT 5.7-1: ***FULL BUILDOUT OF THE GENERAL PLAN UPDATE WOULD RESULT IN AN INCREASE IN CONSTRUCTION, CREATING THE POTENTIAL FOR SHORT-TERM UNQUANTIFIABLE INCREASES IN POLLUTANT CONCENTRATIONS FROM THE INDIVIDUAL PROJECT SITES. AFTER PROJECT DEVELOPMENT, THE QUALITY OF STORM RUNOFF (SEDIMENT, NUTRIENTS, METALS, PESTICIDES, PATHOGENS, AND HYDROCARBONS) MAY BE ALTERED. [THRESHOLDS HD-1 AND HD-6]***

Impact Analysis: The majority of land potentially available for development within the City of San Bernardino has been urbanized; therefore, the implementation of the General Plan Update is not expected to result in a significant increase in runoff volumes. The City's Sphere of Influence, however, does contain vacant and undeveloped areas that with urbanization would contribute urban runoff and/or stormwater runoff to the local drainage system through an increase in impervious surfaces. An increase in the amount of impervious surfaces interrupts the natural cycle of gradual percolation of water through vegetation and soil. Instead of natural percolation, large volumes of runoff are quickly routed from surfaces, such as asphalt and concrete, to drainage systems. Effects of this process can include streambank scouring and downstream flooding, both potential problems in the San Bernardino area. The Municipal Code, as well as the NPDES program requires all future development of one acre or more to manage stormwater from construction sites in a manner which would reduce impacts to water quality. Section 5.15.2, *Wastewater Treatment and Collection*, contains additional discussion regarding potential discharge to the Santa Ana watershed from future wastewater treatment facilities. The City will, however, examine all projects with soil disturbing activities.

GP IMPACT 5.7-2: ***DEVELOPMENT PURSUANT TO THE PROPOSED GENERAL PLAN UPDATE WOULD NOT SUBSTANTIALLY INCREASE THE AMOUNT OF IMPERVIOUS SURFACES THROUGHOUT THE CITY AND SOI AND THEREFORE IMPACTS TO GROUNDWATER RECHARGE WOULD BE MINIMAL. [THRESHOLD HD-2]***

Impact Analysis: The General Plan Update would not result in a significant reduction in groundwater recharge due to the limited amount of vacant area available for development that could be turned into impervious surfaces. As stated previously, an increase in the amount of imperious surfaces could interrupt the natural cycle of gradual percolation of water through vegetation and soil in groundwater recharge areas.

The Bunker Hill Basin has a safe yield of 232,100 acre-feet annually. The Basin is not currently in overdraft condition and is pumping water to relieve high groundwater conditions in some lower sections of the Basin. Additionally, percolation basins have been established in several locations near the north boundary of the City to capture mountain stream run-off for recharge to the Basin and control flooding. The Basin is the primary supply of drinking water for the City and surrounding jurisdictions. In addition, the General Plan Update contains goals, policies and programs encouraging water conservation and preservation of the percolation basins. Additional discussion of water supply and demand can be found in Section 5.15.1.

GP IMPACT 5.7-3: ***DEVELOPMENT PURSUANT TO THE PROPOSED GENERAL PLAN BUILDOUT WOULD NOT SIGNIFICANTLY ALTER EXISTING DRAINAGE PATTERNS IN THE CITY AND SOI BUT WOULD INCREMENTALLY INCREASE THE AMOUNT OF IMPERVIOUS SURFACES. THE RESULTING INCREASE IN STORM WATER FLOWS WOULD NOT SUBSTANTIALLY IMPACT EXISTING DRAINAGE SYSTEMS WITHIN THE WATERSHED. [THRESHOLSD HD-3, HD-4, AND HD-5]***

Impact Analysis: Buildout according to the General Plan Update is not likely to result in the alteration of the course of a stream or river. However, implementation of the General Plan Update may alter the existing localized (project level) drainage patterns within the San Bernardino area and increase the amount of impervious surfaces through the continued development of vacant areas. New development would be required to size storm water drainage facilities appropriately. The amount of vacant land available for development is somewhat limited, however. Natural erosion processes are often accelerated through human activities such as land development through grading and the reduction of surface area. The extreme topographic relief between the valley and the surrounding mountains makes erosion and sedimentation an important issue for some areas of San Bernardino. Erosion on steep or graded slopes especially in the northern portion of the City can contribute to slope failure hazards in the City. The City does have a Hillside Management Overlay Zone to regulate development that would alter slopes in these areas.

Any impact to the drainage pattern and potential erosion hazards would be mitigated on a project by project basis by adherence to NPDES requirements as well as the City's Municipal Code, which includes provisions for on-site stormwater retention for undeveloped properties of one acre or more in size. Additionally, the General Plan contains methods to reduce erosion through goals, policies, and programs related to the protection of the drainage systems. The General Plan policies also require compliance with the NPDES program.

GP IMPACT 5.7-4: ***PORTIONS OF THE CITY AND SOI ARE LOCATED WITHIN A 100-YEAR FLOOD HAZARD AREA. [THRESHOLDS HD-7 AND HD-8]***

Impact Analysis: The San Bernardino area has the potential for flooding problems related to the Santa Ana River and its tributaries. The United States Army Corps of Engineers (USCOE) has rated the potential of the Santa Ana River system for disastrous flood damage as the greatest west of the Mississippi due to its large drainage area (177 square miles). There have been 14 significant floods in the Santa Ana Basin since 1900, with the latest one occurring in 1978. Although significant strides have been made to reduce potential flooding impacts due to the overflow of the Santa Ana River, such as the recently completed Seven Oaks dam, there are some areas within the City that are still within the 100-year flood zone. They are primarily limited to drainages flowing out of the mountains to the north, the percolation ponds, Lytle Creek, Cajon Creek and areas adjacent the Santa Ana River, which can be seen in Figure 3.1-2. The mountain drainages can contribute to flash-flooding, the most recent event occurring on Christmas Day in 2003. Most drainages that are tributary to the Santa Ana River within the City have been confined to lined channels where flooding can be reasonably controlled.

Future development of structures for human occupancy should be restricted or prohibited within the 100-year flood zone and critical facilities should be restricted or prohibited within the 500-year flood zone, contingent on whether acceptable engineering measures can be applied to reduce the hazard. Critical facilities such as schools should have evacuation plans in place that cover the possibility of flooding. Facilities using, storing, or otherwise involved with substantial quantities of on-site hazardous materials should not be permitted in the flood zones, unless all standards of elevation, anchoring, and flood proofing have been satisfied, and hazardous materials are stored in watertight containers that will not float. Campgrounds and other similar types of activities should also be prohibited in high-risk flood areas, at least during the rainy season.

The implementation of the General Plan Update has limited potential to expose people or structures to the risk of flooding due to the confinement of most drainages in flood control devices and land use designations that restrict residential development in flood prone areas. Flood prone areas (100-year flood plain) outside of the existing flood control devices are limited to a few isolated areas as shown in Figure 5.7-1 that are surrounded by development. Development in these isolated flood-prone areas would increase impervious surfaces, such as asphalt, and reduce the absorption of water into the ground, which results in runoff to downstream areas. However, any additional development in these areas would be required to improve the site (such as raising the elevation) and provide on-site storm drain systems to avoid the risk of isolated flooding.

GP IMPACT 5.7-5: PORTIONS OF THE CITY ARE LOCATED WITHIN THE INUNDATION AREA OF THE SEVEN OAKS DAM. [THRESHOLD HD-9]

Impact Analysis: The Seven Oaks Dam is the closest dam to the City of San Bernardino. Several areas within the City of San Bernardino are located within the inundation area of the Seven Oaks dam, which is located eight miles northeast of the City of Redlands. Although failure of the dam would release a significant amount of water (approximately 145,600 acre-feet of water during flood conditions) the dam is engineered to withstand an earthquake measuring 8.0 on the Richter scale, with any point able to sustain a displacement of four feet without causing any overall structural damage. The proposed General Plan contains policies that prohibit land use development in inundation prone areas intended for human occupancy which would limit risk to the population in the event of dam failure. The inundation zone is primarily limited to industrial uses.

GP IMPACT 5.7-6: IMPLEMENTATION OF THE GENERAL PLAN UPDATE WOULD NOT RESULT IN INUNDATION BY SEICHE OR TSUNAMI HOWEVER LOCALIZED MUDFLOWS COULD OCCUR IN THE MOUNTAINOUS AREA ON THE NORTHERN CITY BOUNDARY. [THRESHOLD HD-10]

Impact Analysis: A seiche is a small tidal wave that occurs in a lake or other enclosed body of water. Seiches may be generated by ground motion during an earthquake. A seiche may cause an overflow of a lake, reservoir or lagoon. No features of this nature exist in San Bernardino or the SOI. A tsunami is a high ocean wave generated by a submarine earthquake or volcanic eruption. San Bernardino is located inland and would not be affected by tsunamis.

The Santa Ana River and its tributaries especially those out of the mountainous areas have the potential to carry large amounts of debris, or debris flow. Debris has the potential to fill or plug structures designed to collect and convey runoff, forcing floodwaters into the adjacent areas. Rapidly moving flows heavily laden with debris are also extremely dangerous. Mudflows are a potential hazard in San Bernardino, as well, especially to development at the base of the mountains. However, development of vacant areas would be required to adhere to the Hillside Management Overlay Zone and meet the requirements of the Santa Ana Region Area-Wide Urban Strom Water Run-off permit (NPDES) which would limit the potential for mudflow.

Relevant General Plan Policies and Programs

The following City of San Bernardino General Plan policies and programs related to hydrology and water quality include:

Land Use Element

Policy 2.6.3: Capitalize on the recreational and environmental resources offered by the Santa Ana River and Cajon Wash by requiring the dedication and development of pedestrian and greenbelt linkages.

Policy 2.7.2: Work with the San Bernardino Valley Municipal Water District to create additional water storage capacity and take advantage of the abundant water supplies.

Utilities Element

Policy 9.3.1: Provide for the construction of upgraded and expanded water supply, transmission, distribution, storage, and treatment facilities to support existing and new development.

Policy 9.4.1: Ensure that adequate storm drain and flood control facilities are provided in a timely manner to protect life and property from flood hazards.

Policy 9.4.2: Upgrade and expand storm drain and flood control facilities to eliminate deficiencies and protect existing and new development.

Policy 9.4.4: Require that adequate storm drain and flood control facilities be in place prior to the issuance of certificates of occupancy. Where construction of master planned facilities is not feasible, the Mayor and Common Council may permit the construction of interim facilities sufficient to protect present and short-term future needs.

Policy 9.4.5: Implement flood control improvements that maintain the integrity of significant riparian and other environmental habitats.

Policy 9.4.6: Minimize the disturbance of natural water bodies and natural drainage systems.

Policy 9.4.7: Develop San Bernardino's flood control system for multi-purpose uses, whenever practical and financially feasible.

Policy 9.4.8: Minimize the amount of impervious surfaces in conjunction with new development.

Policy 9.4.9: Develop and implement policies for adopting Sustainable Stormwater Management approaches that rely on infiltration of stormwater into soils over detention basins or channels. Sustainable Stormwater Management techniques include use of pervious pavements, garden roofs, and bioswales to treat stormwater, and reusing stormwater for non-potable water uses such as landscape irrigation and toilet/urinal flushing.

Policy 9.4.10: Ensure compliance with the Federal Clean Water Act requirements for National Pollutant Discharge Elimination System (NPDES) permits, including requiring the development of Water Quality Management Plans, Erosion and Sediment Control Plans, and Storm Water Pollution Prevention Plans for all qualifying public and private development and significant redevelopment in the City.

Policy 9.4.11: Implement an urban runoff reduction program consistent with regional and federal requirements, which includes requiring and encouraging the following examples of Best Management Practices (BMPs) in all developments:

- Increase permeable areas, install filtration controls (including grass lined swales and gravel beds), and divert flow to these permeable areas to allow more percolation of runoff into the ground;
- Use natural drainage, detention ponds, or infiltration pits to collect and filter runoff;
- Prevent rainfall from entering material and waste storage areas and pollution-laden surfaces; and
- Require new development and significant redevelopment to utilize site preparation, grading, and other BMPs that provide erosion and sediment control to prevent construction-related contaminants from leaving the site and polluting waterways.

Safety Element

Policy 10.4.1: Promote integrated inter-agency review and participation in water resource evaluation and mitigation programs.

Policy 10.4.2: Protect surface water and groundwater from contamination.

Policy 10.4.3: Eliminate or remediate old sources of water contamination generated by hazardous materials and uses.

Policy 10.4.4: Develop programs and incentives for prevention of groundwater contamination and clean up of known contaminated sites.

Policy 10.5.1: Ensure compliance with the Federal Clean Water Act requirements for National Pollutant Discharge Elimination System (NPDES) permits, including developing and requiring the development of Water Quality Management Plans for all new development and significant redevelopment in the City.

Policy 10.5.2: Continue to implement an urban runoff reduction program consistent with regional and federal requirements, which includes requiring and encouraging the following:

- Increase permeable areas to allow more percolation of runoff into the ground;
- Use natural drainage, detention ponds or infiltration pits to collect runoff;
- Divert and catch runoff using swales, berms, green strip filters, gravel beds and French drains;
- Install rain gutters and orient them towards permeable surfaces;
- Construct property grades to divert flow to permeable areas;
- Use subsurface areas for storm runoff either for reuse or to enable release of runoff at predetermined times or rates to minimize peak discharge into storm drains;
- Use porous materials, wherever possible, for construction of driveways, walkways and parking lots; and
- Divert runoff away from material and waste storage areas and pollution-laden surfaces such as parking lot.

Policy 10.5.3: Cooperate with surrounding jurisdictions and the County to provide adequate storm drainage facilities.

Policy 10.5.4: Require new development and significant redevelopment to utilize site preparation, grading and foundation designs that provide erosion control to prevent sedimentation and contamination of waterways.

Policy 10.5.5: Ensure compliance with the requirements for Storm Water Pollution Prevention Plans or Water Quality Management Plans for all new development or construction activities.

Policy 10.5.6: Coordinate with appropriate federal, state, and local resource agencies on development projects and construction activities affecting waterways and drainages.

Policy 10.6.1: Maintain flood control systems and restrict development to minimize hazards due to flooding.

Policy 10.6.2: Use natural watercourses as the City's primary flood control channels whenever feasible.

Policy 10.6.3: Keep natural drainage courses free of obstructions.

Policy 10.6.4: Evaluate all development proposals located in areas that are subject to flooding to minimize the exposure of life and property to potential flood risks.

Policy 10.6.5: Prohibit land use development and/or the construction of any structure intended for human occupancy within the 100-year flood plain as mapped by the Federal Emergency Management Agency (FEMA) unless adequate mitigation is provided against flood hazards.

Policy 10.6.6: Encourage new development to utilize and enhance existing natural streams, as feasible.

Policy 10.6.7: Utilize flood control methods that are consistent with Regional Water Quality Control Board Policies and Best Management Practices (BMPs).

Policy 10.6.8: Review development proposals for projects within the City's Sphere of Influence and encourage the County to disapprove any project that cannot be protected with an adequate storm drain system.

Policy 10.6.9: Ensure major drains in developed areas have a pipeline capacity to comply with the Flood Control District's Comprehensive Storm Drain Plans for development of the City's storm drain system.

Policy 10.6.10: Design local drains in foothill areas to convey 25-year storm flows where downstream systems are lacking and street systems are not present.

Policy 10.6.11: Design major drains in foothill to convey 100-year flows within a pipe or channel areas where downstream systems are lacking and street systems are not present.

Policy 10.6.12: Develop a process to study flooding issues and create appropriate regulations. This could include the creation of "alluvial districts," local quasi-government entities designed to inform homeowners of flood risks as well as advise the floodplain land use decisions of the City.

Energy and Water Conservation Element

Policy 13.2.1: Coordinate and monitor the City's water conservation efforts on an annual basis and modify or expand them as necessary to ensure their effectiveness.

Policy 13.2.2: Require that development not degrade surface or groundwater, especially in watersheds, or areas with high groundwater tables or highly permeable soils.

Policy 13.2.3: Consider the establishment of incentives, funding programs, or a rebate program for projects that implement water conservation measures, such as replacing aging, leaking, and/or inefficient plumbing with more efficient, water-saving plumbing.

Policy 13.2.4: Require the use of reclaimed water for landscape irrigation and other non-contact uses for industrial projects, golf courses, and freeways.

Policy 13.2.5: Mitigate degradation of the groundwater basins that may have already occurred by existing commercial, industrial, and other uses.

Policy 13.2.7: Require that new development incorporate improvements to channel storm runoff to public storm drainage systems and prevent discharge of pollutants into the groundwater basins and waterways.

Policy 13.2.8: Require that development in the City's watersheds incorporate adequate landscape and groundcover to prevent slope erosion and significant sedimentation of canyon drainages.

5.7.3.2 Arrowhead Springs

The Arrowhead Springs Specific Plan area consists of approximately 1,916 acres, of which 506 acres would be more intensively developed. Approximately 200 acres is currently developed as (former) resort facilities including small office buildings and maintenance facilities.

AHS IMPACT 5.7-1: ***DURING THE CONSTRUCTION PHASE OF THE PROPOSED PROJECT, THERE IS THE POTENTIAL FOR SHORT-TERM UNQUANTIFIABLE INCREASES IN POLLUTANT CONCENTRATIONS FROM THE SITE. AFTER PROJECT DEVELOPMENT, THE QUALITY OF STORM WATER RUNOFF (SEDIMENT, NUTRIENTS, METALS, PESTICIDES, PATHOGENS, AND HYDROCARBONS) MAY BE ALTERED. [THRESHOLDS HD-1 AND HD-6]***

Impact Analysis: The proposed project is located within the Waterman Canyon (West Twin Creek) and East Twin Creek watersheds. These water courses are tributary to the Santa Ana River and would also be the source of irrigation water and drinking water for the development. The project would involve the construction of new buildings, residences, golf course, utility relocations, and roadway construction. As part of the proposed project, a portion of West Twin Creek in Waterman Canyon would be altered during construction the golf course and residential areas. Construction of the proposed project and operation of planned land uses could impact water quality on surface and ground water resources.

In the initial stages of project development, vegetation removal, earth moving activities and grading associated with project construction would have the potential to increase pollutant concentrations from the site. Implementation of the specific plan would require grading of approximately 300 acres of undisturbed soil and redevelopment of the existing development footprint of approximately 200 acres. Excavation and embankments would be required to construct the building pads, transportation improvements, and utilities associated with project development. Additionally, retaining walls would be needed in some locations for cut and fill purposes. Approximately 7,000,000 cubic yards of earth would be cut from undeveloped slopes and moved as fill to establish a base grade for new development areas. Cut and fill would be balanced on-site, with an additional 1,000,000 cubic yards potentially being moved to remediate landslide areas. Additional grading may also be required to establish pad sites for drinking water reservoirs and access roads to reach them. Within the specific plan area, many areas would be protected from disturbance to preserve open space and the existing native vegetation. Due to the project's proximity to perennial waterways, during the rainy season in particular, construction activities could lead to temporary impacts on surface water quarter quality. Construction activities could result in an increase in sediment deposited in local streams, the release of other pollutants associated with construction, and/or increased soil erosion that could adversely affect these watercourses.

Within the existing facility area, vegetation would also be removed from some areas, demolition of buildings would take place and some grading conducted to establish expanded roadways, parking areas and pads for existing facility expansion. The conceptual grading plan is shown in Figure 3.3-6. Mass grading and the removal of vegetation during project construction would expose site soils to rain, sheet-flow and gullying erosion prior to development and revegetation of the site. The cleared, exposed surfaces and soil stockpiles created during construction could create sedimentation in downstream waters.

Development of the site would urbanize a total of approximately 506 acres, including 199 acres for a golf course, which would result in substantial alteration in the existing site conditions and the introduction of urban pollutant sources. Urban runoff would typically contain oils, grease, fuels, by products of combustion and other household pollutants. Additionally, runoff from the golf course could contain pesticides and nitrates from fertilizers as a result of golf course operations. The nitrates could increase the nutrient loading

in surface waters, encouraging algal booms, and disturbing the nutrient cycling process. Fertilizers and pesticides could also percolate through the soil and contaminate local groundwater.

Ponding, detention and flood routing is proposed along the golf course as a method to mitigate peak discharges of some stormwater from the development; however recycled water is also expected to be stored in open lined reservoirs in the same areas. Unless specifically designed, recycled water could be commingled with stormwater during flooding events with potential to impact downstream water quality. The use of recycled water for irrigation around the development may also have the potential to reach the drinking water intake of East Twin Creek. The location of the drinking water intake and areas to be irrigated with recycled water has not been specifically identified.

Stormwater management is the key in the control and prevention of water quality degradation. There are many Best Management Practices (BMPs) available for achieving the best possible water quality. BMPs are required and would protect receiving waters from degradation and correct existing problems. Common BMPs include structural control as well as nonstructural controls. Structural controls used in the management of stormwater in commercial and residential areas are typically used for the purpose of restoring the quality of water exiting the site to the quality existing before the project development. These systems could provide pollutant removal as well as reduce peak flow rates. Typical structural controls for use with the proposed land uses and site characteristics could include detention basins, water quality inlets or oil/grit separators, grassed swales, filter strips, porous pavement, slope protection, storm drain system stenciling and signage, proper trash storage area design, proper hazardous materials outdoor storage design efficient irrigation and landscape design. Non-structural controls emphasize controlling the source of pollutants. The two most frequently used source controls are erosion/sediment control ordinances and public education. Others include activity restrictions, BMP maintenance, common area landscape management, spill contingency management, street sweeping and common area catch basin inspection.

AHS IMPACT 5.7-2: ***DEVELOPMENT PURSUANT TO THE PROPOSED PROJECT WOULD INCREASE THE AMOUNT OF IMPERVIOUS SURFACES ON THE SITE AND UTILIZE SURFACE WATERS OTHERWISE DESTINED FOR GROUNDWATER RECHARGE REDUCING OPPORTUNITIES FOR GROUNDWATER RECHARGE. [THRESHOLD HD-2]***

Impact Analysis: The proposed project is located in the San Bernardino Groundwater Basin (Bunker Hill Sub-basin). Implementation of the specific plan would involve the development of approximately 506 acres of the Arrowhead Springs Specific Plan area. Project implementation would increase the amount of impervious surfaces in the area, thus impacting the opportunity for groundwater recharge. Recharge to the Basin historically has resulted from infiltration of runoff from the San Gabriel and San Bernardino Mountains, with more than 60 percent of the recharge coming from the Santa Ana River, Mill Creek and Lytle Creek. Lesser contributors include Cajon Creek, San Timoteo Creek and most of the creeks flowing southward out of the San Bernardino Mountains. The proposed project site is located within the West Twin Creek (Waterman Canyon) and East Twin Creek watersheds, which contribute to groundwater recharge through the percolation basins south of the Arrowhead Springs property but have not been identified as a significant groundwater recharge area by the Santa Ana Regional Water Quality Control Board.

However, the proposed project would take significant quantities of water from the surface water streams in the project area and/or retrieve through wells in the Basin excess water that would normally reach the percolation ponds, which would reduce the amount of water available for groundwater recharge in the Basin. No location has been established for these wells but they would be located nearby off-site, south of the Arrowhead Springs property, with connecting infrastructure. The Arrowhead Springs project is estimated to require a total of 4,035 acre-feet of water per year for domestic and irrigation purposes all derived directly or indirectly (through wells in the Basin) from the West Twin and East Twin Creek watershed. Approximately 977 acre-feet would be recovered through reclamation of wastewater to be used for irrigation. Impacts to

Waters of the United States due to taking water from the streams can be found in Section 5.4 of this EIR, *Biological Resources*, and Section 5.15.1, *Water Supply and Distribution Systems*. As discussed in Section 3.3.4.3 and Section 5.15.1, the Del Rosa Mutual Water Company and the West Twin Creek Mutual Water Company have rights to water in those streams. The potential impacts to stream hydrology from withdrawing water for the project would be greatest whenever there are sustained periods of drought and low water flow. It has not been established if resource agencies would require a minimum flow of water in drought years nor has the facilities plan for the development established a minimum flow requirement.

AHS IMPACT 5.7-3: ***DEVELOPMENT PURSUANT TO THE PROPOSED PROJECT WOULD INCREASE THE AMOUNT OF IMPERVIOUS SURFACES ON THE SITE AND WOULD THEREFORE INCREASE SURFACE WATER FLOWS INTO DRAINAGE SYSTEMS WITHIN THE WATERSHED. [THRESHOLD HD-3, HD-4, AND HD-5]***

Impact Analysis: As indicated in the conceptual grading plan, the existing drainage pattern of the site would be substantially altered, particularly along West Twin Creek where the main stem of the water course would be completely relocated for approximately 1.3 miles to construct the golf course and establish pad sites for residential areas. Approximately 22,783 linear feet of potential jurisdictional waters[3] out of a total of 85,936 linear feet of stream/drainage could be impacted by the project. As discussed in Section 5.3, *Biological Resources*, an exact delineation of jurisdictional waters has not been completed and the impact described here is conservative. A portion of these drainages has been previously impacted by the MWD inland feeder project, which is depicted in Figure 5.3-3, *Plant Communities,* as "disturbed" vegetation. The amount and type of runoff generated by the project would be greater than under existing conditions due to increases in impervious surfaces as well as the introduction of a golf course.

The undeveloped 100-year storm run off was calculated to be 17,695 cubic feet per second (cfs) including off site storm run off associated with the site under moisture conditions. Upon completion of the proposed project, the total storm water flow from the project would be 18,167 cfs including off site storm run off for 100-year storm event under moisture conditions. Therefore the proposed project would increase the run off amount by 472 cfs. The summary results of the hydrology analysis for this area are shown in Table 5.7-1. The proposed hydrograph points, illustrating peak flows from the project site, are show in Figure 5.7-3. It should be noted however that these calculations are based on conceptual grading plans. Waterman Canyon is subject to flash flooding and it is anticipated that the design of the golf course would be engineered to function as overflow basins for flood conditions with potential to reduce peak flow during those times.

Table 5.7-1
Unit Hydrograph Peak Flow Summary

Hydrograph No.	Watershed	Area (Acres)	Peak Flow (cfs)
A	Waterman Canyon, Arrowhead Springs, Developed Condition	3,394	6,450
A	Waterman Canyon, Arrowhead Springs, Undeveloped Condition	3,394	6,288
B	East Twin Creek, Arrowhead Springs, Developed Condition	5,929	11,717
B	East Twin Creek, Arrowhead Springs, Undeveloped Condition	5,929	11,407

Note: Developed Peak flows are based on AMC-III moisture condition.
Undeveloped Peak Flows are based on AMC-II moisture condition.

To protect the development and down stream properties from flood hazards as a result of increased amount of impervious surfaces, the drainage system for Arrowhead Springs has been designed to transport storm water runoff from each of the sub basins through the site to points where it would be discharged back into

[3] See Section 5.3, *Biological Resources* for discussion of jurisdictional waters.

the natural water courses as shown in Figure 3.3-10. The storm water infrastructure for Arrowhead Springs would be sized and developed in compliance with all applicable ordinances as required by the local and state agencies. A public street system improved with curbs and gutters and asphalt paving to City standards, meeting the approval of the Public Works Department, would provide access to commercial areas and residential lots, each graded to drain in a positive manner. The design of the golf course and relocation of West Twin Creek would require careful coordination with resource agencies such as California State Fish and Game, USCOE and the Santa Ana Regional Water Quality Control Board to ensure that all impacts associated with the project from withdrawal of water from drainages to loss of riparian habitat are successfully mitigated.

AHS IMPACT 5.7-4: PORTIONS OF THE PROJECT SITE PROPOSED FOR DEVELOPMENT ARE LOCATED WITHIN A 100-YEAR FLOOD HAZARD AREA. [THRESHOLDS HD-7 AND HD-8]

Impact Analysis: Portions of the specific plan area lying adjacent to West Twin Creek are subject to 100-year flood plain inundation; however a specific 100-year floodplain elevation has not been determined for all of the property. The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) depicts the flood plain boundary of West Twin Creek as following along the water course with varying widths as slope and channel characteristics change. Potential jurisdictional waters are depicted in Figure 5.3-4 in *Biological Resources.* Project development along these areas would be primarily limited to golf course; however small residential pad sites are planned along West Twin Creek in the northern portion of the property. Grading would be designed to place structural/habitable development areas above any flood plain areas associated with these water courses.

As mentioned previously, to reduce the potential for flooding in the project area, the fairways of the golf course would be designed and graded to function as overflow basins as part of a flood control mechanism for West Twin Creek. FEMA maps would need to be modified to reflect the redesigned 100-year flood contour.

AHS IMPACT 5.7-5: THE PROJECT SITE IS NOT LOCATED WITHIN THE INUNDATION AREA OF THE SEVEN OAKS DAM. [THRESHOLD HD-9]

Impact Analysis: The residential areas planned for the Arrowhead Springs Specific Plan, located on the northern border of the City in the San Bernardino Mountains, would be at a higher in elevation than all other areas of the City and would be several miles away from the Seven Oaks Dam inundation zone. Therefore, no people or structures would be affected by dam failure. However, the MWD water pipeline, which is 12 feet in diameter, does run through the property. Rupture of the pipeline would result in localized flooding that would primarily be confined to the West and East Twin Creek drainages. The probably of an event of this nature is considered low. See Section 5.6, *Hazards and Hazardous Materials* for additional discussion.

AHS IMPACT 5.7-6: THE SITE WOULD NOT BE SUBJECT TO INUNDATION BY SEICHE OR TSUNAMI; HOWEVER THERE IS POTENTIAL FOR MUDFLOWS. [THRESHOLD HD-10]

Impact Analysis: East and West Twin Creeks have the potential to carry debris, or debris flow from respective watersheds through the project area. Debris has the potential to fill or plug structures designed to collect and convey runoff, forcing floodwaters into the adjacent areas. Rapidly moving flows heavily laden with debris are also extremely dangerous. Mudflows are a potential hazard in the Arrowhead Springs area, due to the hilly terrain, known landslide areas within the specific plan area and the extent of the watershed for both East and West Twin Creeks.

A seiche is a small tidal wave that occurs in a lake or other enclosed body of water. Open pools and above ground water storage reservoirs in the specific plan area can be susceptible to seiches. Seiches within a

storage tank could cause damage to their structures. If tanks are damaged during an earthquake, the water released has the potential to impact structures down gradient. Many of the water storage tanks for the development are planned for locations that are down gradient of structures and all are designed with an outer containment tank in the event of breach thereby reducing potential for inundation of structures.

A tsunami is a high ocean wave generated by a sub-marine earthquake or volcanic eruption with potential to affect coastal communities. Arrowhead Springs is located inland and at elevations that would not be affected by a tsunami.

Arrowhead Springs Specific Plan Relevant Development Standards

The following general development standards contained within the Arrowhead Springs related to hydrology and water quality for the Arrowhead Springs area include:

- On-site catch basins or siltation basins, as well as energy-absorbing devices, may be required as a means to prevent erosion as well as to provide for ground water recharge.
- Natural drainage courses should be protected from grading activity.
- Where brow ditches are required, naturalize with plant materials and native rocks.
- Maximum coverage of the Arrowhead Springs Specific Plan Area (1,916 acres) by impervious surfaces shall not exceed 10% of the gross land area.
- Prior to the issuance of a grading permit, a site specific drainage study, which meets the standards of the City Engineer, will be prepared by a Civic Engineer registered in the State of California. All recommendations from this analysis, including facilities necessary to mitigate drainage impacts, maximize percolation and groundwater recharge to the extent feasible shall be incorporated in all grading and site improvement plans.
- The applicant shall mitigate on-site storm water discharge sufficiently to maintain compliance with the City's NPDES Storm Water Discharge Permit Requirements. A "Notice of Intent" (NOI) shall be filed with the State Water Quality Control Board for construction disturbing one acre or more of land.

5.7.4 Existing Regulations and Standard Conditions

5.7.4.1 General Plan

- Future projects shall comply with applicable federal, state, and local regulations governing water quality standards and waste discharge requirements. These include but are not limited to the requirements of the CWA, SDWA, and NPDES. Waste discharge requirements have been established for the incorporated cities of San Bernardino County, the County Flood Control District and the remainder of the County within the Santa Ana Region Area-Wide Urban Storm Water Runoff (NPDES) permit otherwise known as the San Bernardino County MS4 permit. The City has adopted a Storm Water Drainage Systems ordinance (Title 8, Health & Safety, Chapter 8.80) that provides measures for compliance with the MS4 permit including but not limited to protection of the storm drainage system (8.80.205), prohibited discharges (8.80.206), compliance with Best Management Practices (8.80.208), treatment of storm water runoff (8.80.209) and spill containment (8.80.211).and established Water Quality Management Plan requirements for all new development. All new development is required to submit for approval a Storm Water Quality Management Plan outlining all structural and non-structural BMPs during and after construction in adherence with this ordinance.

- Future projects encompassing an area one acre or more shall submit for approval to the State Water Resources Control Board, a Notice of Intent to be covered under the General Construction Storm Water Permit, in compliance with the NPDES program. In addition, future projects shall be required to develop and implement a Storm Water Pollution Prevention Plan (SWPPP), which incorporates Best Management Practices (BMPs) that address pollutant source reduction and provide measures/controls necessary to mitigate potential pollutant sources. These include, but are not limited to: erosion controls, sediment controls, tracking controls, non-storm water management, materials and waste management, good housekeeping practices and monitoring.

5.7.4.2 Arrowhead Springs

- The applicant shall submit for approval to the State Water Resources Control Board, a Notice of Intent to be covered under the Storm Water Permit. Additionally, the project proponent shall prepare a SWPPP which will: (1) require implementation of Best Management Practices (BMPs) so as to prevent a net increase in sediment load in storm water discharges relative to preconstruction levels; (2) prohibit during the construction period discharges of storm water or non storm water at levels which would cause or contribute to an exceedance of applicable water quality standards contained in the Basin Plan; (3) discuss in detail the BMPs planned for the project related to control of sediment and erosion, non sediment pollutants, and potential pollutants in non storm water discharges; (4) describe post construction BMPs for the project; (5) explain the maintenance program for the project's BMPs; (6) during construction, require reporting of violations to the Regional Board; and (7) list the parties responsible for SWPPP implementation and BMP maintenance during and after grading. The project proponent shall implement the SWPPP and will modify the SWPPP as directed by the Storm Water Permit.

- The applicant shall develop a Water Quality Management Plan in accordance with the requirements of the MS4 Permit and Chapter 8.80 (Strom Water Drainage System) of the Municipal Code and shall submit the WQMP for review to the City. The City shall approve the WQMP prior to the granting of land disturbing permits for the proposed development. The WQMP shall: 1) describe the routine and special post construction BMPs to be used at the proposed development site (including both structural and non structural measures); 2) describe responsibility for the initial implementation and long term maintenance of the BMPs; 3) provide narrative with the graphic materials as necessary to specify the locations of the structural BMPs; and 4) certify that the project proponent will seek to have the WQMP carried out by all future successors or assigns to the property.

- Municipal Code Title 13, Public Utilities, Chapter 13.04 Wells contain provisions for documenting amounts of water withdrawn from wells in the San Bernardino Basin.

- Municipal Code Title 13, Public Utilities, Chapter 13.24 Water System Supply contains requirements for drilling water wells

5.7.5 Level of Significance Before Mitigation

5.7.5.1 San Bernardino General Plan Update

Upon consideration of General Plan policies and implementation of regulatory requirements and standard conditions of approval, the following impacts would be less than significant:

GP Impact 5.7-1 The limited availability of vacant land to convert to impervious surfaces that would increase the potential for water quality degradation and adherence to NPDES requirements including local ordinances for Storm Water Drainage Systems would reduce potential impacts of implementation of the General Plan update to less that significant.

GP Impact 5.7-2 There would be no substantial reduction to ground water recharge due to the limited amount of vacant land to convert to impervious surfaces due and urban uses.

GP Impact 5.7-3 Existing drainage patterns would not be significantly altered and impervious surfaces would not be greatly increased through implementation of the General Plan update with the exception of hillside areas near the San Bernardino Mountains where vacant land could be converted to urban uses. The Hillside Management Overlay Ordinance and NPDES requirements for the MS4 permits would limit impacts of increased storm water flows.

GP Impact 5.7-4 The General Plan update limits potential for development of residential structures in flood prone areas.

GP Impact 5.7-5 The policies and land use designations of the General Plan update limit development of structures for human occupancy in inundation areas.

GP Impact 5.7-6 Potential for localized mudflows in hillside areas would be minimized by the Hillside Management Overlay ordinance.

5.7.5.2 Arrowhead Springs

Upon consideration of development standards and implementation of regulatory requirements and standard conditions of approval, the following impacts would be less than significant:

AHS Impact 5.7-5 The project site is not located in a dam inundation zone.

AHS Impact 5.7-6 Adherence to the project development standards and the Hillside Management Overlay ordinance and standard engineering practice would limit potential for mudflows to affect the project site.

Without mitigation, the following impacts would be **potentially significant**:

AHS Impact 5.7-1 During the construction phase of the proposed project, there is the potential for short-term unquantifiable increases in pollutant concentrations from the site. After project development, the quality of storm runoff (sediment, nutrients, metals, pesticides, pathogens and hydrocarbons) may be altered.

AHS Impact 5.7-2 Development pursuant to the proposed project would increase the amount of impervious surfaces on the site and would therefore impact opportunities for groundwater recharge. Additionally water would be withdrawn from local streams that would otherwise flow to percolation basins for aquifer recharge.

AHS Impact 5.7-3 The proposed project would increase the amount of impervious surfaces on the site and therefore increase surface water flows into drainage systems within the watershed.

AHS Impact 5.7-4 The project would alter the 100-year flood plain elevation within close proximity of proposed residential areas.

5.7.6 Mitigation Measures

5.7.6.1 San Bernardino General Plan Update

No significant impacts were identified and no mitigation measures are necessary.

5.7.6.2 Arrowhead Springs Specific Plan

AHS 5.7-1A Prior to the issuance of land disturbing permits, the applicant shall provide the City Engineer with evidence that a Notice of Intent (NOI) has been filed with the State Water Resources Control Board. Such evidence shall consist of a copy of the NOI stamped by the State Water Resources Control Board or the Regional Water Quality Control Board, or a letter from either agency stating that the NOI has been filed a minimum of thirty days prior to commencing grading operations.

AHS 5.7-1B Prior to issuance of land disturbing permits and in compliance with the requirements of the State General Construction Activity Storm Water Permit, the project applicant shall prepare a Storm Water Pollution Prevention Plan (SWPPP) that incorporates measures or comparable Best Management Practices which describe the site, erosion and sediment controls, means of waste disposal, implementation of approved local plans, control of post-construction sediment and erosion control measures and maintenance responsibilities, and non-storm water management controls. The SWPPP shall also be submitted to the City of San Bernardino Public Works Department. The applicant shall require all construction contractors to retain a copy of the approved SWPPP on each construction site. Additionally, the SWPPP shall ensure that all water discharges are in compliances with the current requirements of the California Regional Water Quality Control Board, Santa Ana Region.

AHS 5.7-1C Prior to issuance of land disturbing permits and in compliance with City of San Bernardino Municipal Code Chapter 8.80, the applicant shall prepare a Storm Water Quality Management Plan (SWQMP). The SWQMP shall implement all applicable BMPs, as listed in the California Storm Water Best Management Practices Handbooks or the current, San Bernardino County Storm Water Program's Report of Waste Discharge, to reduce pollutants in storm water and runoff and reduce non-storm water discharges to the City's storm water drainage system to the maximum extent practicable. The SWQMP shall demonstrate compliance with California Department of Health Services Section 60310 Use Area Requirements, which state that "no impoundment of disinfected tertiary recycled water shall occur within 100 feet of any domestic water supply well," and "no irrigation with, or impoundment of, disinfected secondary or disinfected secondary recycled water shall take place within 100 feet of any domestic water supply well."

AHS 5.7-1D Prior to the issuance of land disturbing permits for the golf course, a Chemical Application Management Plan (CHAMP) shall be submitted to and approved by the City of San Bernardino. The CHAMP or similar management plan shall incorporate but not be limited to the following:

- A description of chemicals authorized for use and approved by the State of California, along with guidelines for their application. Guidelines shall include restrictions on their application and their use near drainage systems. Chemicals include fertilizers, herbicides, fungicides, insecticides and rodenticides. Guidelines on the application of fertilizers and soil amend-

ments shall take into account consideration the physical characteristics and nutrient content of the soil on the golf course site.

- Guidelines for the irrigation of the golf course that take into consideration the field capacity of soil types and the timing with chemical applications; and

- Chemical storage requirements and chemical spill response and chemical inventory response plans shall be prepared and implemented.

AHS 5.7-1E A water quality monitoring system and program shall be developed and implemented in conjunction with the CHAMP that provides for sampling of all permanent surface water features on a quarterly basis and includes an analysis for non-volatile synthetic organic chemicals, total dissolved solids, chloride, sulfate, total phosphorus, boron, nitrogen as nitrate, total nitrogen, and iron. This monitoring program shall be implemented with consideration of the RWQCB water quality objectives.

AHS 5.7-2A Prior to approval of the first Tentative Tract Map, evidence shall be provided to the Development Services Department that appropriate water rights have been granted including a determination of maximum and minimum withdrawal of water from East and West Twin Creek watersheds (in conjunction with mitigation measure 5.15-1).

AHS 5.7-2B Prior to approval of the first Tentative Tract Map, the applicant shall secure a site for the supplemental water wells in the San Bernardino Basin and obtain a drilling and operation permit in accordance with Chapter 13.24 (Water Supply System) of the Municipal Code.

AHS 5.7-3A Prior to issuance of land disturbing permits, the applicant shall submit a Final Drainage Plan Report to the City of San Bernardino for review and approval in conformance with the City of San Bernardino requirements that are in effect at the time of submittal. The report shall be prepared by a qualified registered professional civil engineer and shall, at a minimum, include the following:

- A written text addressing existing conditions, the effects of projects improvements, all appropriate calculations, a watershed and hydrology map, changes in downstream flows and elevations, proposed on and off-site improvements (catch basins, inlets, vaults, swales, filters, etc. for entrapment of sediment debris and contaminants), and features to protect downstream uses and property. The project drainage features shall be designed to ensure no change in downstream flow conditions that would result in new or increased severity of flooding.

- The report shall provide evidence of compliance with all required approvals from the Regional Water Quality Control Board (401 Water Quality Waiver) and with USCOE 404 permitting for changes to “waters of the U.S.”

AHS 5.7-3B Maintenance of the storm drainage facilities shall be the responsibility of the project applicant until such time as the facilities are turned over to the City as a public improvement, or included within a Landscape Maintenance District or project home-owners or maintenance association. Easements shall be created and offered for dedication to the City for maintenance and access to these facilities as necessary in anticipation of possible City maintenance.

AHS 5.7-4 Prior to issuance of building permits the project applicant shall prepare and file an application with Federal Emergency Management Agency (FEMA), a Letter of Map Revision (LOMR) for Flood Insurance Rate Maps as necessary to reflect changes to the floodway or flood plain resulting from the development to demonstrate that all habitable structures are not subject to flooding in a 100-year storm. The Department of Public Works shall be provided a copy of the LOMR.

5.7.7 Level of Significance After Mitigation

The mitigation measures identified above would reduce potential impacts associated with hydrology and water quality to a level that is less than significant. Therefore, no significant unavoidable adverse impacts relating hydrology and water quality have been identified.

5.8 LAND USE AND PLANNING

Land use impacts can be either direct or indirect. Direct impacts are those that result in land use incompatibilities, division of neighborhoods or communities, or interference with other land use plans, including habitat or wildlife conservation plans. This section focuses on direct land use impacts. Indirect impacts are secondary effects resulting from land use policy implementation, such as an increase in demand for public utilities or services, or increased traffic on roadways. Indirect impacts are addressed in other sections of this EIR.

This analysis focuses on land use and planning impacts associated with the adoption and implementation of the proposed Arrowhead Springs Specific Plan and General Plan, including the University District Specific Plan, as these actions have the potential to result in direct land use impacts. The General Plan, University District Specific Plan, and Arrowhead Springs Specific Plan are described in detail in Section 3.0, *Project Description,* and are shown in Figures 3.3-2 through Figure 3.3-4.

The Preferred Land Use Alternative and policies throughout the General Plan Update are also evaluated for consistency with relevant regional plans including the Southern California Association of Government's Regional Comprehensive Plan and Guide (RCPG) and 2004 Regional Transportation Plan (RTP).

5.8.1 Environmental Setting

5.8.1.1 San Bernardino General Plan Update

The City of San Bernardino is located approximately 60 miles east of the City of Los Angeles in the upper Santa Ana River Valley. This valley is framed by the San Bernardino Mountains on the northeast and east, the Blue Mountains and the Box Springs Mountains abutting the Cities of Loma Linda and Redlands to the south, and the San Gabriel Mountains and the Jurupa Hills to the northwest and southwest, respectively. San Bernardino is surrounded by the Cities of Rialto to the west, Colton to the southwest, Loma Linda to the south, Redlands to the southeast, Highland to the east, and the San Bernardino National Forest to the north.

The City of San Bernardino encompasses an area that stretches from just south of the 10 Freeway on the south to the Cajon Creek Wash and the San Bernardino Mountains on the north. The City's total planning area is 45,231 acres, or 71 square miles. This includes 38,402 acres, or 60 square miles, of incorporated territory and 6,829 acres, or 11 square miles, of unincorporated lands within the City's Sphere of Influence.

Existing Land Use Conditions

There is no current and reliable existing land use data available for analysis purposes. Changes from the existing land use designations are examined below in the section entitled "Existing General Plan/Zoning Land Uses." However, an analysis was made using the 2000 Census and 2000 Employment projections from SCAG, as seen in Table 5.8-1 below. The 2000 data is only available for the City's existing jurisdictional boundaries. For purposes of this analysis, the population, housing, and employment within the jurisdictional boundaries has been analyzed.

Table 5.8-1
Existing Conditions and General Plan Build-out Projections

	2000	Proposed General Plan Build-out Projections	
	City Only	City Only	City + Sphere
Population [1]	185,401	276,264	319,241
Units [1]	63,535	82,714	95,664
Employment [2]	81,115	338,712	355,629

[1] 2000 US Census
[2] April 2004 RTP Population, Household, and Employment forecasts for the City of San Bernardino and SANBAG subregion.

Existing General Plan/Zoning Land Uses

The San Bernardino General Plan was last comprehensively updated in 1989. The City currently utilizes a single map system, that is to say the General Plan and Zoning maps are combined. The existing General Plan Land Use plan and Zoning Map consists of 39 land use designations grouped under five broad categories: Residential, Commercial, Industrial, Other, and Open Space. Table 3.3-3 in Section 3.0 documents the existing General Plan land use designations by acreage and percentage. There are two existing overlays not reflected in Table 3.3-3. The Hillside Management Overlay and the Foothill Fire Zone Overlay (FF) are coterminous and cover the mountainous areas of the City. The existing General Plan map is shown on Figure 5.8-1.

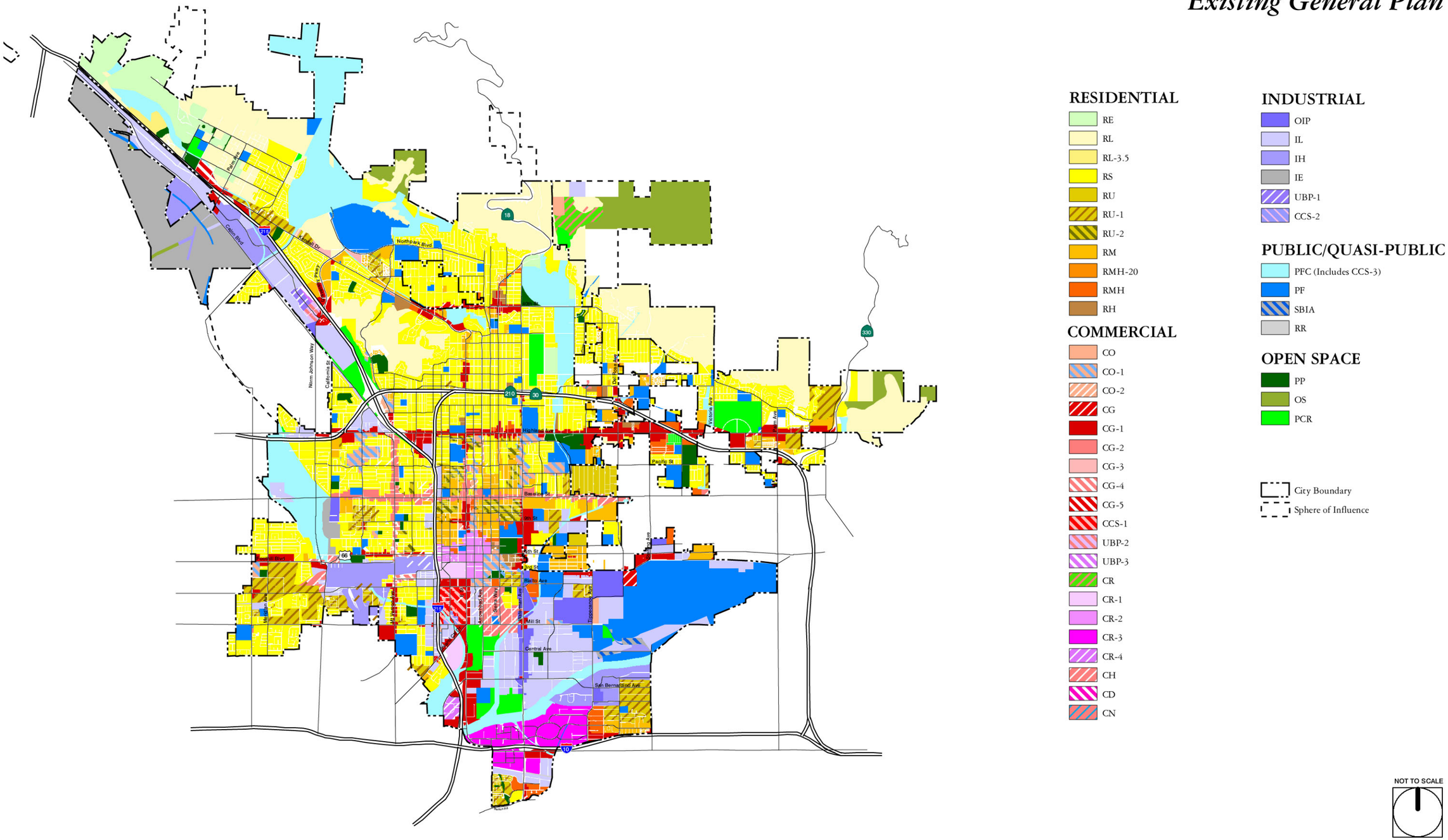
Existing Development Code

The City's Development Code is the primary tool for implementing the General Plan, and provides development standards, identifies allowed uses, and specifies other regulations. The Development Code provides detailed guidance for development based on and consistent with land use policies established in the General Plan. The proposed project does not involve an update to the Development Code; however, the EIR evaluates the consistency of the proposed General Plan with the current Zoning Code.

Existing Specific Plans

San Bernardino has six approved specific plans governing land use development in designated areas throughout the City: CALMAT (A.K.A. Cajon Creek Specific Plan), Highland Hills Specific Plan, Paradise Hills Specific Plan, Paseo Las Placitas Specific Plan (Also known as the Mt. Vernon Corridor Specific Plan), San Bernardino International Trade Center Specific Plan, and University Business Park Specific Plan. Specific plans are documents that provide focused guidance and regulation for defined areas of the City. These plans typically include a land use, circulation, infrastructure, phasing, financing, and implementation plan, as well as development standards and design guidelines. These Specific Plans have been incorporated into the proposed Land Use Plan.

Existing General Plan



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Redevelopment Areas

The San Bernardino Redevelopment Agency has the following ten Redevelopment Project Areas, as shown on Figure 5.8-2:

- Central City Projects
- Central City North
- Central City West
- State College
- Southwest Industrial Park
- Northwest
- Tri-city
- South Valle
- Uptown
- Mt. Vernon Corridor

Since their adoption, various developments have occurred within these redevelopment areas, such as: senior housing facilities, California Theatre renovation, Main library branch, Stater Bros. Central City Plaza, Social Security Offices, E Street sewer main replacement, Redlands Boulevard Pavement Rehabilitation, Santa Fe Deport Planning, and Lowe's Retail Center.

Sphere of Influence

The Sphere of Influence (SOI) is comprised of 6,829 acres, or 11 square miles, of unincorporated County territory, as shown on Figure 3.1-2 in Section 3.0. The County of San Bernardino has jurisdiction over these areas and the County's General Plan Land Use Plan provides land use designations for the SOI. These land use designations within the SOI include: rural living, single- and multi-family residential, neighborhood commercial, office commercial, floodway, resource conservation, institutional, and community and regional industrial.

Indian Lands

Descendents of the Serrano Indians, the San Manuel Band of Mission Indians is located on the San Manuel Reservation immediately adjacent to the City of San Bernardino. The United States government established the Reservation for the San Manuel (Tribe) in 1891. The San Manuel Band of Mission Indian's reservation is currently just over 800 acres and includes the San Manuel Indian Bingo and Casino and the San Manuel Bottled Water Group.

San Bernardino International Airport (SBIA)

The San Bernardino International Airport and Trade Center (SBIA) is located in the southeastern edge of the City. The SBIA is comprised of two portions: 1) the airport and related facilities of the former Norton Air Force Base, and 2) the Trade Center, which encompasses the non-airport portions of the property.

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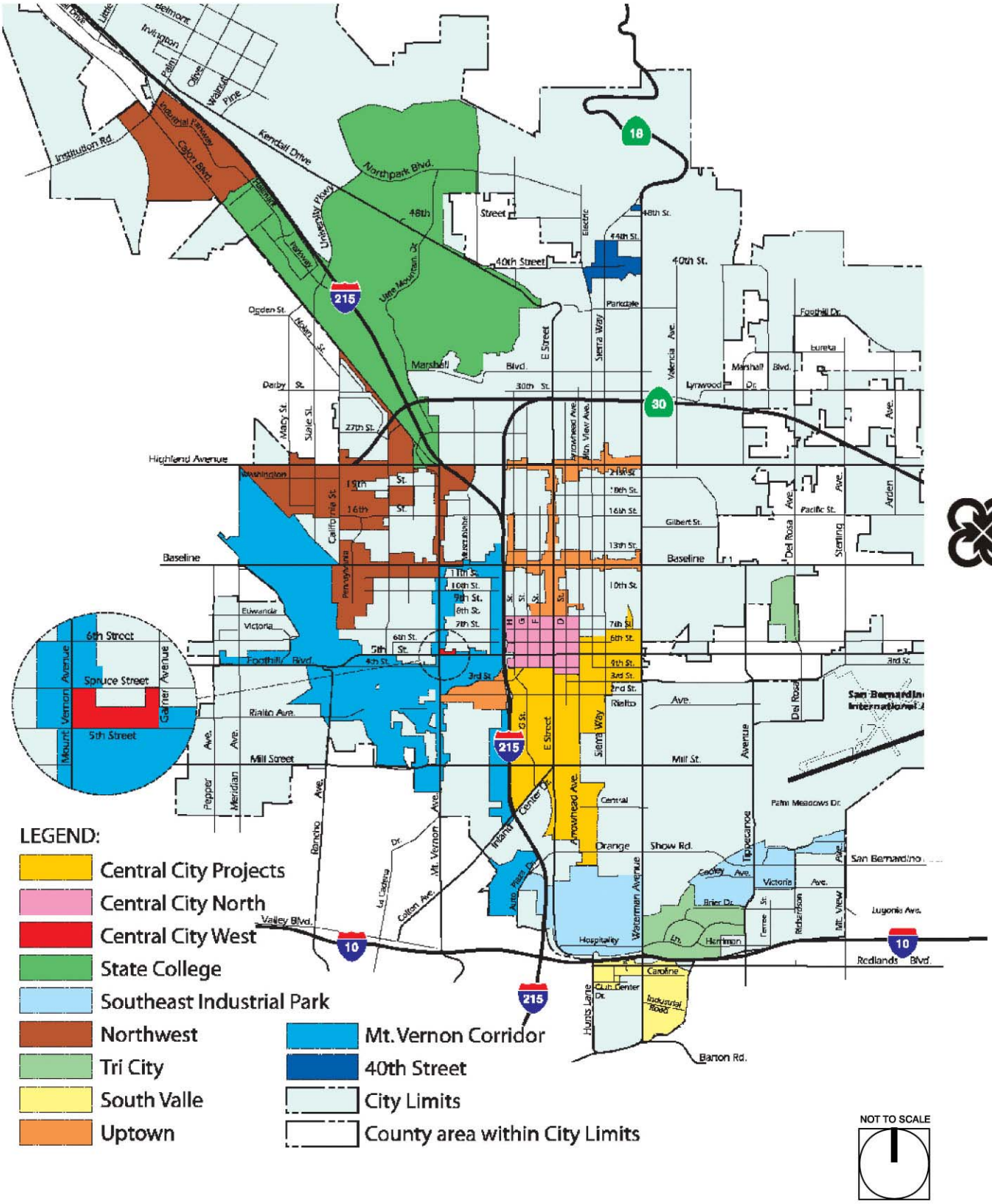
Redevelopment Areas



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The Airport contains approximately 1,350 acres, which are managed by the San Bernardino International Airport Authority (SBIAA), a Joint Powers Authority made up of representatives from the cities of San Bernardino, Highland, Loma Linda, Colton, and the County of San Bernardino.

The Trade Center portion of the SBIA is composed two noncontiguous areas of the former Norton Air Force Base totaling approximately 652 acres. The Trade Center is managed by the Inland Valley Development Agency (IVDA) and is addressed in the San Bernardino International Trade Center Specific Plan. The IVDA is a Joint Powers Authority made up of representatives from the cities of San Bernardino, Loma Linda, Colton, and the County of San Bernardino. The proposed General Plan update reflects the land uses from this adopted specific plan.

The General Plan must be consistent with the Comprehensive Land Use Plan (CLUP) and the Airport Master Plan for the SBIA. This is necessary to ensure that the General Plan policies and recommendations for noise impact assessment, land uses, and densities are appropriate given the nature of airport operations. For planning purposes, the airport safety zones and 65 decibel (dB) Community Noise Equivalent Level (CNEL) noise contours are utilized. The noise contours and safety zones for the San Bernardino International Airport are defined in the CLUP. However, the CLUP and the Airport Master Plan for the SBIA are not adopted as of the writing of this EIR or the General Plan Update.

In addition, Sections 11010 of the Business and Professions Code and Sections 1102.6, 1103.4, and 1353 of the Civil Code require buyer notification/disclosure for lands within the airport influence area, a 2-mile radius from the airport runways.

Regional Planning Programs

Regional Comprehensive Plan and Guide (RCPG) and the 2004 Regional Transportation Plan (RTP)

The Southern California Association of Governments (SCAG) is the federally recognized Metropolitan Planning Organization for the region encompassing the counties of Riverside, San Bernardino, Imperial, Orange, Ventura, and Los Angeles. SCAG is required to develop, maintain, and update a Regional Transportation Plan (RTP) every three years for the six-county region. The RTP is a multi-modal plan that provides a basic policy and program framework for improving the balance between land uses and transportation systems. The 2004 Regional Transportation Plan (RTP) links the goal of sustaining mobility with the goals of fostering economic development, enhancing the environment, reducing energy consumption, promoting transportation-friendly development patterns, and encouraging fair and equitable access to residents affected by socio-economic, geographic, and commercial limitations.

SCAG has also developed a Regional Comprehensive Plan and Guide (RCPG) to help coordinate transportation and infrastructure, open space and environmental planning with population, housing, and employment growth in the multi-county region. The RCPG, adopted in 1995 by SCAG's governing board, the Regional Council, contains policies that address planning priorities for the region. Some of these are "core" policies that implement state or federal mandates, while most of the policies are "ancillary" or "advisory only" guidance for local jurisdictions and public agencies. The RCPG package of policies seeks to coordinate infrastructure with projected population and housing growth. In general, SCAG policies encourage job and housing opportunities to be balanced at the county or Regional Statistical Area, both much larger than the project level.

San Bernardino Associated Governments (SANBAG) is the council of governments and transportation planning agency for San Bernardino County, including all its incorporated cities. SANBAG is responsible for cooperative regional planning and furthering an efficient multi-modal transportation system countywide. SCAG's regional growth forecasts for population, household and employment in the SANBAG subregion and City of San Bernardino are as follows:

Table 5.8-2
April 2004 RTP Population, Household, and Employment Forecasts

	2000	2005	2010	2015	2020	2025
SANBAG Subregion						
Population	1,718,311	1,919,215	2,059,420	2,229,700	2,397,709	2,558,729
Household	530,498	567,172	618,782	686,584	756,640	826,669
Employment	594,923	669,028	770,877	870,491	972,243	1,074,861
Jobs-to-household Ratio	1.12	1.18	1.25	1.27	1.28	1.30
County of San Bernardino						
Population	758,054	821,045	865,149	**897,295**	929,181	960,025
Household	244,476	260,357	275,352	289,318	303,596	317,831
Employment	337,247	346,770	381,680	403,000	424,470	445,193
Jobs-to-household Ratio	1.38	1.33	1.39	1.39	1.40	1.40
City of San Bernardino						
Population	185,772	199,035	207,021	208,860	210,672	212,404
Household	56,341	57,221	58,288	60,211	62,290	64,440
Employment	81,115	88,791	99,337	110,056	120,965	131,943
Jobs-to-household Ratio	1.44	1.55	1.70	1.83	1.94	2.05

Source: April 2004 RTP Population, Household, and Employment forecasts for the City of San Bernardino and SANBAG subregion.

5.8.1.2 Arrowhead Springs Specific Plan

Arrowhead Springs-Existing Land Use Conditions

The majority of the Arrowhead Springs property is currently undeveloped. The property is crisscrossed on its western side by both SR-18 and Waterman Canyon Road. The developed portion of the property consists of less than 200 acres and approximately 320,000 square feet of buildings including the historic 1939 hotel/spa resort which has 135 rooms, ten residential-styled bungalows, meeting halls, maintenance buildings and a small office building for the caretaker staff and security employees. Other facilities include steam caves, an historic swimming pool, tennis courts and outdoor theater. In one section of the developed area is the 'Village,' a group of five buildings totaling 60,000 square feet were constructed by CCC as dormitories, dining facilities, and meeting rooms. The resort/spa facilities are not currently open to the public.

Three hundred sixty-eight acres of the Arrowhead Springs Specific Plan area are currently located in the incorporated City of San Bernardino. The remaining 1,548 acres are located in unincorporated County of San Bernardino. There is one unit within the incorporated portion and ten units in the unincorporated portion of the Specific Plan. Ten of these units are part of the hotel and were intended as temporary housing. A few units are used by maintenance staff as permanent housing. Currently, there are nine permanent residents that also work at Arrowhead Springs. Employment at Arrowhead Springs consists of maintenance and security staff and the offices of the American Development Group. During the business week, there are twenty employees on-site.

Arrowhead and Puritas Water, Inc., a subsidiary of Nestles, occupies a portion of the southwestern edge of the property where it maintains a pumping station for the transfer of spring water to its trucks. The spring water is sourced from a site located outside of the boundary of the Arrowhead Springs property. Metropolitan Water District (MWD) owns a 10-acre parcel adjacent to the front entry on Old Waterman Canyon Road, which is the site of their tunnel portal for the Inland Feeder Project. Current easements for these properties are shown in Figure 3.3-11.

Two blue-line streams run through the property on an annual basis: West Twin Creek and East Twin Creek and its tributaries. There are several locations where hot thermal springs spill out onto the ground. These are named Granite Springs, Penyugal Springs, the Steam Caves, and another abandoned hot springs near West Twin Creek. Several thermal wells also exist on the property, which service the existing hotel, residences, and swimming pool.

Arrowhead Springs occupies the lower portions of two converging valleys and consists of steep mountainous terrain and rolling foothills. West Twin Creek and East Twin Creek converge into a manmade flood control basin, known as the Waterman Canyon Channel, designed by the Army Corps of Engineers. It consists of several percolation and retention basins, which lie adjacent to or near the south property line.

Arrowhead Springs-Existing General Plan/Zoning Designations

As mentioned, 368 acres of the Arrowhead Springs are currently located in the incorporated City and the remaining 1,548 acres are located in unincorporated County of San Bernardino. The jurisdictional boundaries are shown on Figure 3.1-2.

City of San Bernardino

The portions of Arrowhead Springs located within the City of San Bernardino are subject to its General Plan and Development Code. The lands within the City's existing jurisdictional boundaries are currently designated for Residential Estate (RE), Residential Low (RL), Residential Suburban (RS), and Public Flood Control (PFC), as shown in Figure 5.8-3. Except for PFC, these designations permit residential development at densities ranging from one unit per acre to 4.5 units per acre.

County of San Bernardino

The unincorporated portions of Arrowhead Springs are subject to the County of San Bernardino's General Plan and Zoning Code. The lands within the County are zoned for Resource Conservation (RC), Rural Living-3 (RL-3), and Single Residential-1 (RS-1), as shown in Figure 5.8-3. The RC designation permits one unit per 40 acres and is intended for open space, conservation, and development of natural resources. The majority of the undeveloped portions of Arrowhead Springs fall within this designation. A small portion of Arrowhead Springs is designated RL-3, which allows one dwelling unit per three acres. On the very northern portion of the Arrowhead Springs property is a small pocket designated as RS-1, which allows one unit per acre.

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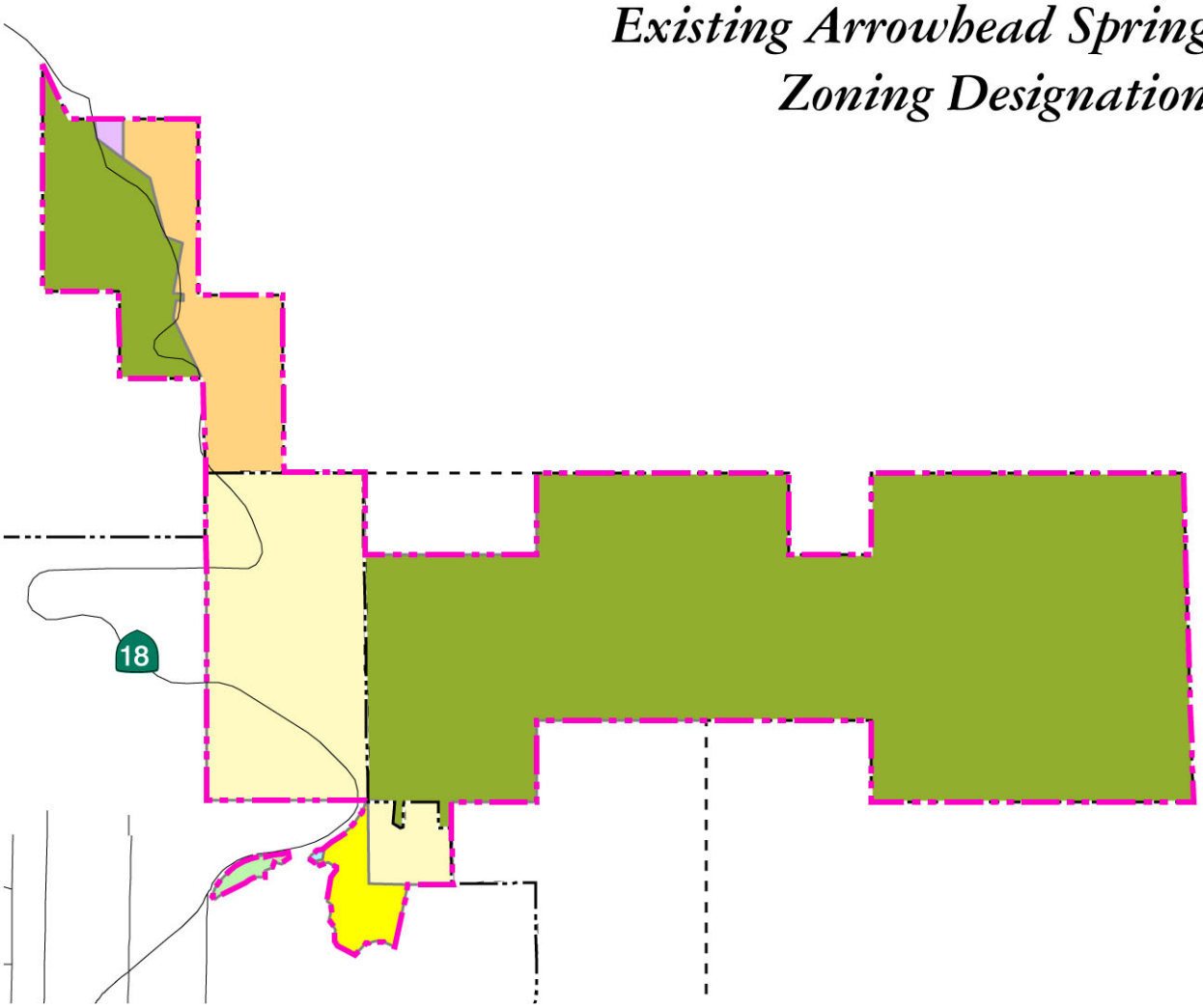
Existing Arrowhead Springs Zoning Designations



Existing City of San Bernardino Zoning Designations

- PFC
- RE
- RL
- RS

Existing County of San Bernardino Zoning Designations

- RS-1
- RL-3
- RC

- Arrowhead Springs Boundary
- City Boundary
- Sphere of Influence

NOT TO SCALE

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5.8.2 Thresholds of Significance

According to Appendix G of the CEQA Guidelines, a project would normally have a significant effect on the environment if the project would:

LU-1 Physically divide an established community.

LU-2 Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect.

LU-3 Conflict with any applicable habitat conservation plan or natural community conservation plan.

The following impact analysis addresses thresholds of significance for which the Initial Study, included in Appendix A, disclosed as potentially significant impacts. The applicable thresholds are identified in parentheses after the impact statement.

5.8.3 Environmental Impacts

5.8.3.1 San Bernardino General Plan Update

GP IMPACT 5.8-1: IMPLEMENTATION OF THE GENERAL PLAN WOULD NOT DIVIDE AN ESTABLISHED COMMUNITY. [THRESHOLD LU-1]

Impact Analysis:

Land Use Changes between the Existing and Proposed General Plans

As stated in Section 3.3.2, there is little difference in the land use maps between the existing and proposed General Plans. In all, there were 8 areas where land use changes occurred between the existing and proposed General Plans totaling 3,197 acres. The areas where land use changes are planned between the existing and proposed General Plans are shown on Figure 5.8-4 and detailed in Table 5.8-3. Each area is identified by a key number so that the location and exact land use changes can be determined.

The largest area of proposed land use change is identified as Area 3 on Figure 5.8-4, which is mostly comprised of the Arrowhead Springs Specific Plan. The proposed land use designations for the Arrowhead Springs Specific Plan are discussed separately in this section.

Aside from Arrowhead Springs, there are 7 areas totaling 1,020.4 acres where changes in land use designations from the existing General Plan are proposed. Many of the remaining changes are map corrections/updates. For instance, the area identified as number 6 on Figure 5.8-4 is designated for residential uses in the existing General Plan but is actually developed as a reservoir. The proposed designation of Public Flood Control (PFC) reflects this reality. The area identified as number 1 is the Patton State Hospital but is designated for Commercial Recreation in the existing General Plan. The proposed designation of Public Facilities (PF) reflects the appropriate long-term use. The proposed change in Area 4 reflects the previously adopted Paradise Hills Specific Plan.

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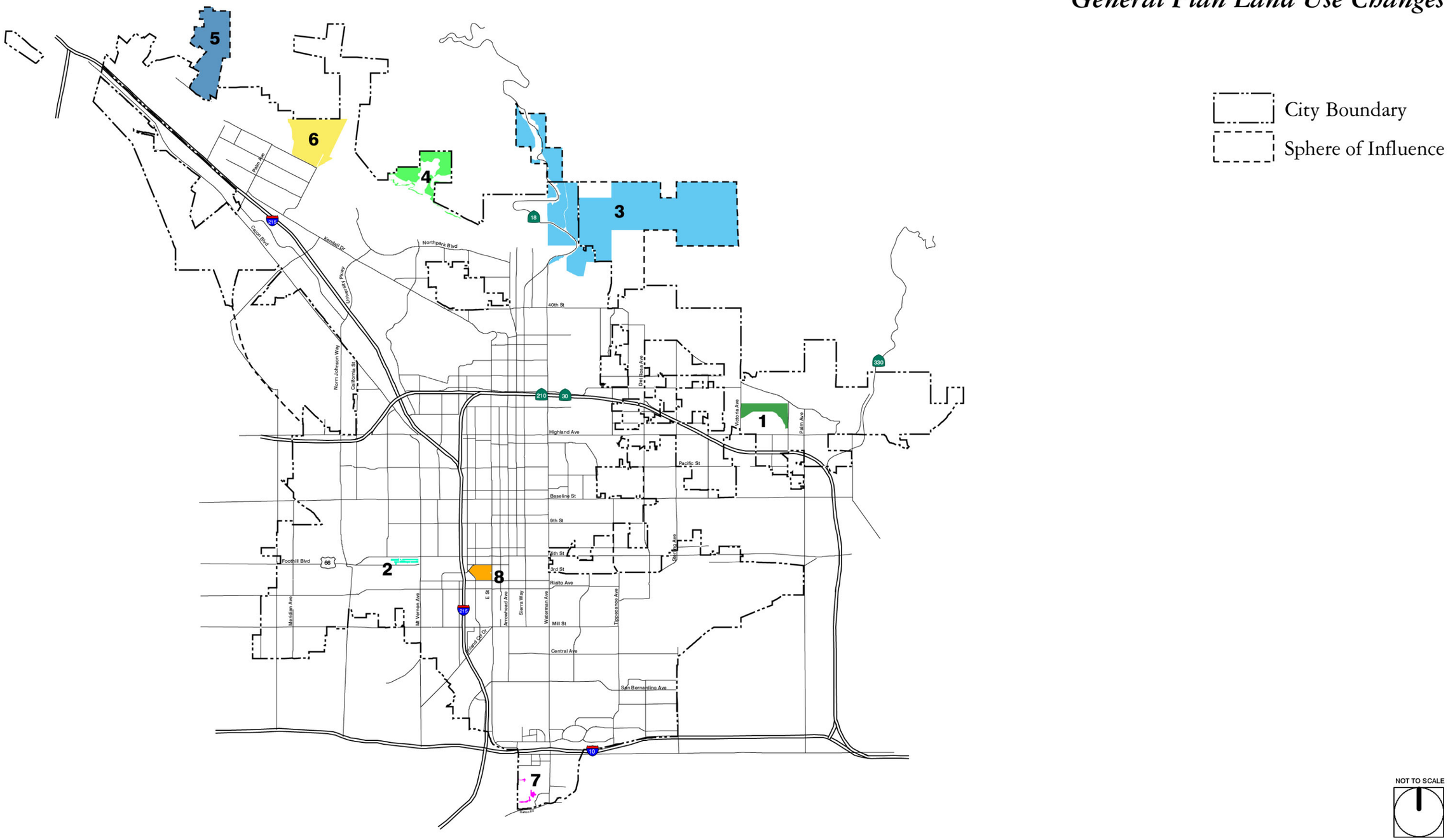
General Plan Land Use Changes



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The area identified as number 2 on Figure 5.8-4 is a proposed shift from residential (RS) to industrial (IL). This 13.1 acre area west of I-215 that is currently developed with and designated for residential uses. In the proposed General Plan, this area is proposed to be changed to Industrial Light (IL). This area is heavily impacted by adjacent industrial uses and the expansion of the industrial designation is intended to allow an alternative use of the property that is in keeping with ongoing industrial use.

Finally, the area identified as number 5, Martin Ranch, is now in the City's Sphere of Influence. This entire area is proposed to be designated as Residential Estate (RE). When this area was added to the sphere of influence, no City General Plan designation was adopted. Pre-zoning for the Martin Ranch project is not included with this update and would occur at a separate time. Finally, the City directed a change in designation on the Carousel Mall property, number 8 on Figure 5.8-4, from CR-1 to CR-2 to allow residential uses.

Table 5.8-3
Changes between the Existing and Proposed General Plans

Map Key (Fig 5.8-4)	*Existing General Plan Designation*	*Acres*	*Proposed General Plan Designation*	*Acres*
1	PCR – Public/Commercial Recreation	86.5	*PF – Public Facilities*	86.5
2	RS – Residential Suburban	13.1	*IL – Industrial Light*	13.1
3 (Arrowhead Springs Specific Plan)	CO – Commercial Office	64.9	*See the Arrowhead Springs Specific Plan*	
	CR – Commercial Regional	166.5		
	OS – Open Space	936.9		
	PCR - Public/Commercial Recreation	60.3		
	PFC – Publicly Owned Flood control	16.3		
	RE – Residential Estate	7.4		
	RL – Residential Low	576.9		
	RS - Residential Suburban	264.5		
	Undesignated	83.0		
4 (Paradise Hills Specific Plan)	RL – Residential Low	156.9	*RL – Residential Low*	8.4
	RS - Residential Suburban	8.6	*RS – Residential Suburban*	0.7
			OS – Open Space	156.5
5 (Martin Ranch)	Not in Sphere	395.2	*RE – Residential Estate*	395.2
6 (Devil's Canyon Reservoir)	PCR - Publicly Owned Flood control	4.8	*PFC- Publicly Owned Flood Control*	308.5
	PF – Public Facilities	29.0		
	RL – Residential Low	207.5		
	RS – Residential Suburban	67.2		
7	RU – 1 Residential Urban	0.1	*PP – Public Parks*	5.3
	RS - Residential Suburban	2.1	*RU – Residential Urban*	2.2
	RU-1 – Residential Urban	5.3		
8 (Carousel Mall)	CR-1 – Commercial Regional	44.0	*CR-2 – Commercial Regional with residential.*	44
Totals		**3,197.0**		**1,020.4**

Please note that not all acreages are identical between the existing and proposed General Plans. This reflects differences in boundaries and methods of calculation.

Aside from these proposed changes, the proposed General Plan maintains the land use distribution envisioned in the existing 1989 General Plan. Major changes from the 1989 plan include a decrease in the amount of residentially and industrially designated land and a slight increase in commercially designated land. A new open space designation is provided to account for permanent open space.

Policies in the General Plan provide incentives for voluntary redevelopment/intensification along the City's commercial corridors. The Corridor Improvement Program provide incentives, in the form of revised development standards, that would entice land owners and developers to concentrate commercial at major intersections and infuse residential or mixed use projects in the mid-block areas. The intent is to reduce the amount of inefficient strip commercial, locate residents closer to services and shopping, help create identity, and reduce vehicle trips.

The implementation of the General Plan Land Use map would not result in the physical division of an established community. Instead, the implementation of the General Plan would preserve and enhance the established community while intensifying commercial uses. Moreover, one of the primary purposes of the General Plan is to minimize the impacts of land use changes to adjacent areas and to ensure the compatibility of these uses. The Land Use Element of the General Plan Update contains goals and policies that encourage the preservation or enhancement of the existing community through infill development, enhanced landscaping, gateways, and pedestrian/bicycle connections, as well as the continuance of the City's resort/residential character and development of compatible uses that would enhance the existing character.

GP IMPACT 5.8-2: IMPLEMENTATION OF THE GENERAL PLAN WOULD NOT CONFLICT WITH APPLICABLE PLANS ADOPTED FOR THE PURPOSE OF AVOIDING OR MITIGATING AN ENVIRONMENTAL EFFECT. [THRESHOLD LU-2]

Impact Analysis: The City of San Bernardino General Plan Update represents a guide for the City's future development. As illustrated in Table 5.8-4, the General Plan provides sufficient dwelling unit, population, and employment capacity to exceed SCAG's projections for 2025. While the build-out capacities are based on land use acreages, building intensity factors, and population density assumptions, they do not predict when the City would reach these capacities or if they will reach these capacities. Rather, they provide an idea of what build-out could mean in terms of total dwelling units, population, and employment, which accounts for the difference with SCAG projections.

Table 5.8-4
SCAG and General Plan Build-out Projections

	SCAG Projections for City of San Bernardino		Existing General Plan	Proposed General Plan Build-out Projections	
	2000	2025	City + Sphere	City Only	City + Sphere
Population	185,772	212,404	355,298	276,264 [2]	319,241 [2]
Household	56,341	64,440	88,020	73,367 [1]	84,854 [1]
Employment	81,115	131,943	369,923	338,712	355,629
Jobs-to-household Ratio	1.44	2.05	4.20	4.62	4.19

Sources: April 2004 RTP Population, Household, and Employment forecasts for the City of San Bernardino and SANBAG subregion.
[1] Derived by applying the vacancy rate of 11.3% per the 2000 Census to the projected number of dwelling units at build-out.
[2] Department of Finance (1/1/04), which utilized 3.340 persons per unit.

The purpose of the General Plan is to chart a course for the next 20 years so that the positive features of the City can be enhanced and built upon and the less desirable features altered and improved. The Key Strategies, listed in Chapter 3, summarize the Vision and emphasize the thrust of the General Plan's direction. While the General Plan Update serves as the framework for the future development of the City, several other planning tools help achieve the City's Vision and implement the General Plan. The goals and policies of the City's Specific Plans and redevelopment areas were factored into the proposed General Plan. Additionally, the General Plan Update provides a basis for zoning and development standards in the City's Development Code. The City's Development Code is not being updated with the General Plan. However, the General Plan Update is consistent with the current code.

San Bernardino International Airport (SBIA)

The General Plan must be consistent with the CLUP and the Airport Master Plan for the SBIA. This is necessary to ensure that the General Plan policies and recommendations for noise impact assessment, land uses, and densities are appropriate given the nature of airport operations. As mentioned, the CLUP and the Airport Master Plan for the SBIA were not adopted as of the writing of this EIR or the General Plan Update. In a joint workshop with representatives of the SBIA, IVDA, and SBIAA, it was determined that the General Plan could include general policies related to airport compatibility at this time. Upon adoption of the CLUP and Airport Master Plan, the General Plan can be amended to incorporate the adopted noise contours and safety zones and any new airport related policies.

The Land Use, Circulation, and Noise Elements of the proposed General Plan include policies that address compatibility with and protection of the SBIA. Specifically, the policies in the proposed General Plan address compatibility with the noise and safety zones in terms of land use, density, and height. The Airport Influence Area was adopted by the SBIA and is incorporated in the General Plan. In this manner, the required notification and buyer disclosure is addressed in the General Plan.

Consistency with SCAG's Regional Plans and Policies

The General Plan Update, University District Specific Plan, and Arrowhead Springs Specific Plan are consistent with the ten core policies of SCAG's Regional Comprehensive Plan and Guide (RCPG) that are relevant to the proposed project. Furthermore, these projects are consistent with the majority of SCAG's ancillary/advisory policies. The consistency of the General Plan Update, University District Specific Plan, and Arrowhead Springs Specific Plan with each of SCAG's applicable regional policies is detailed in Table 5.8-5. This table also demonstrates that the General Plan Update, University District Specific Plan, and Arrowhead Springs Specific Plan contain policies that encourage the City to participate in regional programs and issues.

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Table 5.8-5
Consistency with SCAG Regional Policies

SCAG Policy	Compliance with Policy	Sample Related Goal or Policy-GP Update	Sample Related Goal or Policy – AHS SP
Regional Comprehensive Plan and Guide Policies (RCPG) – Growth Management Chapter (GMC)			
Policy 3.01: The population, housing, and jobs forecasts, which are adopted by SCAG's Regional Council and that reflect local plans and policies shall be used by SCAG in all phases of implementation and review.	SCAG's population, housing, and jobs forecasts were used throughout the preparation of the General Plan Update and Arrowhead Springs Specific Plan.	No policies in the General Plan Update are applicable.	No policies in the Arrowhead Springs Specific Plan are applicable.
Policy 3.03: The timing, financing, and location of public facilities, utility systems, and transportation systems shall be used by SCAG to implement the region's growth policies.	The City is required by California Government Code to coordinate its Circulation Element with regional transportation plans. The Circulation Element is a comprehensive transportation management strategy that addresses infrastructure capacity. The Circulation Element is consistent with SCAG's and SANBAG's plans and policies and integrates data from these regional agencies.	6.4.3 Continue to participate in forums involving the various governmental agencies such as Caltrans, SANBAG, SCAG, and the County that are intended to evaluate and propose solutions to regional transportation problems. 2.7.5 Require that development be contingent upon the ability of public infrastructure to provide sufficient capacity to accommodate its demands and mitigate its impacts.	The Circulation Plan for the Arrowhead Springs Specific Plan is consistent with the City's General Plan Circulation Element. As described in Section VII, Phasing and Implementation, the timing of utilities shall be phased along with the development and will occur in conjunction with the roadway improvements.
GMC Policies Related to the RCPG Goal to Improve the Regional Standard of Living			
Policy 3.05: Encourage patterns of urban development and land use, which reduce costs on infrastructure construction and make better use of existing facilities.	The General Plan contains policies that encourage infill development, intensification of underutilized properties along major corridors and near transit routes. Arrowhead Springs concentrates development on a fraction of the total site in areas that are served by existing infrastructure.	2.4.1 Quality infill development shall be accorded a high priority in the commitment of City resources and available funding. The Corridor Improvement Program in the Land Use Element is an optional package of policy, regulatory, and incentive programs that are intended to stimulate private investment and result in desired development along major corridors. This is accomplished by providing optional incentives, in the form of density bonuses and varied development standards, to developments that qualify.	The Arrowhead Springs Specific Plan concentrates development on 27% of the site and leaves the remainder in permanent open space. Arrowhead Springs will provide its own water, power, sewer, and drainage on-site.

Table 5.8-5
Consistency with SCAG Regional Policies

SCAG Policy	Compliance with Policy	Sample Related Goal or Policy-GP Update	Sample Related Goal or Policy – AHS SP
Policy 3.09: Support local jurisdictions' efforts to minimize the cost of infrastructure and public service delivery, and efforts to seek new sources of funding for development and the provision of services.	The General Plan Update provides policies to increase funding for certain public services, such as parks. The Economic Development Element contains policies that guide fiscal policies for the City.	4.11.1 Address the availability of new financing sources to supplement the primary revenues for both capital facility costs and ongoing operations and maintenance costs. 8.4.2 Continue to require developers of residential subdivisions to provide fee contributions based on the valuation of the units to fund parkland acquisition and improvements. 8.4.5 Consider the use of special taxes, sale of bonds, or assessment districts for park and trail development and maintenance.	Arrowhead Springs will provide on-site: domestic water treatment, supply, distribution, and storage systems; stormwater and flood management systems, including untouched natural channels; wastewater treatment; and solid waste collection and recycling in sufficient size and capacity to support build-out of the plan. Arrowhead Water & Power, the on-site utility company, will provide these services within the Plan area.
Policy 3.10: Support local jurisdictions' actions to minimize red tape and expedite the permitting process to maintain economic vitality and competitiveness.		2.4.1 Quality infill development shall be accorded a high priority in the commitment of City resources and available funding. 2.1.4 Provide assistance in the form of grants, loans, home-improvement efforts, coordinated code and law enforcement, public right-of-way maintenance and enhancement, and trash collection to help improve San Bernardino's residential neighborhoods. 2.4.3 Where necessary to stimulate the desired mix and intensity of development, land use flexibility and customized site development standards shall be achieved through various master-planning devices such as specific plans, planned development zoning, and creative site planning	No policies in the Arrowhead Springs Specific Plan are applicable.

Table 5.8-5
Consistency with SCAG Regional Policies

SCAG Policy	Compliance with Policy	Sample Related Goal or Policy-GP Update	Sample Related Goal or Policy – AHS SP
GMC Policies Related to the RCPG Goal to Improve the Regional Quality of Life			
Policy 3.12: Encourage existing or proposed local jurisdiction's programs aimed at designing land uses which encourage the use of transit and thus reduce the need for roadway expansion, reduce the number of auto trips and vehicle miles traveled, and create opportunities for residents to walk and bike.	The Land Use, Circulation, Natural Resources and Conservation, and Parks, Recreation, and Trails elements provide polices designed to encourage the use of transit and focus on infill development to reduce development in outlying areas.	The Corridor Improvement Program: Proximity to transit. Projects with a residential component that are located within 500 feet of a designated transit stop are eligible to receive up to a 15% density bonus. Mixed-use projects would also receive a 10% increase in floor area ratio to accommodate the additional residential units. 2.3.1 Commercial centers, open spaces, educational facilities, and recreational facilities should be linked to residential neighborhoods. 2.3.2 Promote development that is compact, pedestrian-friendly, and served by a variety of transportation options along major corridors and in key activity areas. 6.6.3 In cooperation with Omnitrans, require new development to provide transit facilities, such as bus shelters and turnouts, as necessary and warranted by the scale of the development. Goal 8.3 Develop a well-designed system of interconnected multi-purpose trails, bikeways, and pedestrian paths. 12.6.1 Promote a pattern of land uses which locates residential uses in close proximity to employment and commercial services and provides, to the fullest extent possible, local job opportunities and commercial service to minimize vehicular travel and associated air emissions.	Arrowhead Springs accommodates both vehicular and non-motorized forms of transportation on an extensive network of roadways and multi-purpose trails. The roadways match the classification and design of the City's street design standards and accommodate pedestrian and bicycle users. In addition, Arrowhead Springs accommodates bike and golf cart paths, sidewalks and equestrian paths.

Table 5.8-5
Consistency with SCAG Regional Policies

SCAG Policy	Compliance with Policy	Sample Related Goal or Policy-GP Update	Sample Related Goal or Policy – AHS SP
		12.6.2 Disperse urban service centers (libraries, post offices, social services, etc.) throughout the City to minimize vehicle miles traveled and the concomitant dispersion of air pollutants.	
Policy 3.13: Encourage local jurisdictions' plans that maximize the use of existing urbanized areas accessible to transit through infill and redevelopment.	The Land Use, Circulation, Natural Resources and Conservation, and Parks, Recreation, and Trails elements encourage infill development and transit use.	See responses to Policies 3.05 and 3.12 above.	Development in Arrowhead Springs is concentrated on 27% of the site, mainly in or near the areas of existing development. Natural features such as ridges, hillsides, and watercourses and the Plan's existing environmental resources, including spring water, geothermal springs, surface streams, are preserved and maintained.
Policy 3.16: Encourage developments in and around activity centers, transportation corridors, underutilized infrastructure systems, and areas needing recycling and redevelopment.	The Land Use, Circulation, Natural Resources and Conservation, and Parks, Recreation, and Trails elements encourage infill development and transit use.	See responses to Policies 3.05 and 3.12 above.	See responses to Policies 3.12 and 3.13 above.
Policy 3.18: Encourage planned development in locations least likely to cause environmental impact.	The Land Use Element describes the location and intensity of land uses, provides guidance for development, and encourages infill development, which reduces the need for new infrastructure improvements as well as other environmental impacts.	2.1.2 Require that new development with potentially adverse impacts on existing neighborhoods or residents such as noise, traffic, emissions, and storm water runoff, be located and designed so that quality of life and safety in existing neighborhoods are preserved. 2.2.2 Require new uses to provide mitigation or buffers between existing uses where potential adverse impacts could occur, including, as appropriate, decorative walls, landscape setbacks, restricted vehicular access, enclosure of parking structures to prevent sound trans-	See responses to Policy 3.13 above.

Table 5.8-5
Consistency with SCAG Regional Policies

SCAG Policy	Compliance with Policy	Sample Related Goal or Policy-GP Update		Sample Related Goal or Policy – AHS SP
			mission, and control of lighting and ambient illumination.	
		2.2.4	Hillside development and development adjacent to natural areas shall be designed and landscaped to preserve natural features and habitat and protect structures from the threats from natural disasters, such as wildfires and floods.	
		2.2.10	The protection of the quality of life shall take precedence during the review of new projects. Accordingly, the City shall utilize its discretion to deny or require mitigation of projects that result in impacts that outweigh benefits to the public.	
		2.6.2	Balance the preservation of plant and wildlife habitats with the need for new development through site plan review and enforcement of the California Environmental Quality Act (CEQA).	
Policy 3.20: Support the protection of vital resources such as wetlands, groundwater recharge areas, woodlands, production lands, and land containing unique and endangered plants and animals.	The Land Use and Natural Resources elements provides adequate policy direction that encourages the protection of resources including biological, energy and minerals, water, natural open space, and cultural resources.	2.6	Control development and the use of land to minimize adverse impacts on significant natural, historic, cultural, habitat, and hillside resources.	Arrowhead Springs dedicates approximately 1,400 acres as open space and watershed, which is intended to protect and preserve existing biological and water resources. This area represents over 73% of the Arrowhead Springs property. Existing valleys, watercourses, and ridgelines are largely untouched and actually preserved outside of the 27% of the site proposed for development.
		12.1.2	Site and develop land uses in a manner that is sensitive to the unique characteristics of and that minimizes the impacts upon sensitive biological resources.	
		12.1.3	Require that all proposed land uses in the "Biological Resource Management Area" (BRM), Figure NRC-1, be subject to	

Table 5.8-5
Consistency with SCAG Regional Policies

SCAG Policy	Compliance with Policy	Sample Related Goal or Policy-GP Update	Sample Related Goal or Policy – AHS SP
		review by the Environmental Review Committee (ERC). 12.2.1 Prohibit development and grading within fifty (50) feet of riparian corridors, as designated in Figure NRC-1 unless no feasible alternative exists.	
Policy 3.21: Encourage the implementation of measures aimed at the preservation and protection of recorded and unrecorded cultural resources and archaeological sites.	The Land Use and Historical and Archaeological Resources elements provide adequate policy direction that encourages the protection of resources including water, natural open space, and cultural resources.	2.6 Control development and the use of land to minimize adverse impacts on significant natural, historic, cultural, habitat, and hillside resources. 11.1.1 Develop a comprehensive historic preservation plan that includes: • Adoption of a Preservation Ordinance. • Establishment of a Historic Resources Commission. • Adoption of the Secretary of Interior Standards for Historic Rehabilitation and the standards and guidelines as prescribed by the State Office of Historic Preservation. • Establishment of a design review process for potential development projects in or adjacent to Historic Preservation Overlay Zones.	The Arrowhead Springs Specific Plan is predicated on the preservation and enhancement of the historic Arrowhead Springs Hotel and Resort/Spa, which will be improved and surrounded by complementary uses, such as conference facilities, offices, hotels, a golf course, and residential uses.
Policy 3.22: Discourage development, or encourage the use of special design requirements, in areas with steep slopes, high fire, and seismic hazards.	The Land Use and Safety elements provides adequate policy direction that address protection from natural and man-made disasters.	2.2.4 Hillside development and development adjacent to natural areas shall be designed and landscaped to preserve natural features and habitat and protect structures from the threats from natural disasters, such as wildfires and floods. 2.6.1 Hillside development and development adjacent to natural areas shall be	The Hillside Development standards in the Specific Plan ensure that development occurs in a manner that protects the hillside's natural and topographic character and identity, environmental sensitivities, aesthetic qualities, and the public health, safety, and general welfare.

Table 5.8-5
Consistency with SCAG Regional Policies

SCAG Policy	Compliance with Policy	Sample Related Goal or Policy-GP Update	Sample Related Goal or Policy – AHS SP
		designed and sited to maintain the character of the City's significant open spaces and historic and cultural landmarks.	
		10.6.5 Prohibit land use development and/or the construction of any structure intended for human occupancy within the 100-year flood plain as mapped by the Federal Emergency Management Agency (FEMA) unless adequate mitigation is provided against flood hazards.	
		10.7.3 Enforce the requirements of the California Seismic Hazards Mapping and Alquist-Priolo Earthquake Fault Zoning Acts when siting, evaluating, and constructing new projects within the City.	
		10.9.3 Require that new construction and significant alterations to structures located within potential landslide areas (Figure S-6) be evaluated for site stability, including potential impact to other properties during project design and review.	
		10.10.2 Require that development in the High Wind Hazard Area, as designated on Figure S-7, be designed and constructed to withstand extreme wind velocities.	
		10.11.2 Work with the U.S. Forest Service and private landowners to ensure that buildings are constructed, sites are developed, and vegetation and natural areas are managed to minimize wildfire risks in the foothill areas of the City.	

Table 5.8-5
Consistency with SCAG Regional Policies

SCAG Policy	Compliance with Policy	Sample Related Goal or Policy-GP Update	Sample Related Goal or Policy – AHS SP
Policy 3.23: Encourage mitigation measures that reduce noise in certain locations, measures aimed at preservation of biological and ecological resources, measures that would reduce exposure to seismic hazards, minimize earthquake damage, and to develop emergency response and recovery plans.	The Land Use, Noise, Safety, and Natural Resource elements provide numerous policy direction and guidance regarding noise reduction, the preservation of natural resources, safety and protection from natural hazards, and the development of emergency response plans. Additionally, the Safety Element offers policy guidance to reduce the impact of geological hazards.	2.2.2 Require new uses to provide mitigation or buffers between existing uses where potential adverse impacts could occur, including, as appropriate, decorative walls, landscape setbacks, restricted vehicular access, enclosure of parking structures to prevent sound transmission, and control of lighting and ambient illumination. Goal 14.1 Ensure that residents are protected from excessive noise through careful land planning. 10.12.1 Maintain a functional City emergency response plan that addresses all hazards. See the responses to Policies 3.18, 3.20, and 3.22.	Arrowhead Springs shall be subject to the City Noise Ordinance, per Section 19.20.030, City of San Bernardino Development Code.
GMC Policies Related to the RCPG Goal to Provide Social, Political, and Cultural Equity			
Policy 3.24: Encourage efforts of local jurisdictions in the implementation of programs that increase the supply and quality of housing and provide affordable housing as evaluated in the Regional Housing Needs Assessment.	The update to the Land Use Element and the existing Housing Element provide policies to encourage the supply of quality housing and affordable housing.	General Plan land use map and designations that allow for total of 95,426 total units, which includes 81,333 dwelling units in the incorporated City and 14,093 dwelling units in the City's sphere of influence. Goal 3.1 Facilitate the development of a variety of types of housing to meet the needs of all income levels in the City of San Bernardino. Goal 3.3 Assist in the development of adequate housing to meet the needs of low and moderate-income households.	Arrowhead Springs provides 1,350 new residential units that did not previously exist, including 36 custom estates, 34 'urban' flats in Village Walk, 266 condominiums and townhomes adjacent to Village Walk, 150 upscale senior units, 150 non-age restricted attached units, 429 golf course condominiums, and 285 townhomes and condominiums in Hilltown.
Policy 3.27: Support local jurisdictions and other service providers in their efforts to develop sustainable communities and provide, equally to all	The Public Services and Facilities Element provides policies on the provision of high quality fire and police protection, as well as adequate education, cultural, and library facilities and services. The Parks, Recreation,	7.1.1 Maintain a complement of personnel in the Police Department that is capable of providing a timely response to criminal activity and can equitably protect all citizens and property in the City.	Arrowhead Springs will provide the necessary infrastructure and utilities to serve 1,350 new residential units and commercial uses on-site. Arrowhead Springs will either provide substations

Table 5.8-5
Consistency with SCAG Regional Policies

SCAG Policy	Compliance with Policy	Sample Related Goal or Policy-GP Update	Sample Related Goal or Policy – AHS SP
members of society, accessible and effective services such as: public education, housing, health care, social services, recreational facilities, law enforcement, and fire protection.	and Trails Element addresses the provision of adequate, well designed, and safe recreational facilities and services. As mentioned in response to Policy 3.24, the Land Use Element and existing Housing Element provide policies to encourage the supply of quality housing and affordable housing.	7.2.1 Assure that adequate facilities and fire service personnel are maintained by periodically evaluating population growth, response time, and fire hazards in the City. 7.3.1 Work with the local school districts, CSUSB, and SBVC to expand facilities and services to meet educational needs. 7.4.14 Construct new libraries and rehabilitate and expand existing library facilities and programs as required to meet the needs of existing and future residents. 8.1.6 Accommodate the recreational needs of the City's residents reflecting their unique social, cultural, ethnic, and physical limitations in the design and programming of recreational spaces and facilities.	on-site or contribute its fair share to police and fire services.
Regional Transportation Plan (RTP) Goals and Policies			
Maximize the mobility and accessibility for all people and goods in the region.	The Circulation and Parks, Recreation, and Trails Elements contain policies that provide specific guidance on how to improve mobility in the City.	6.3.1 Promote the principle that streets have multiple uses and users, and protect the safety of all users. 6.6.1 Support the efforts of regional, state, and federal agencies to provide additional local and express bus service in the City. 6.7.1 Accommodate railroad services that allow for the movement of people and goods while minimizing their impact on adjacent land uses. Goal 8.3 Develop a well-designed system of interconnected multi-purpose trails, bikeways, and pedestrian paths.	Arrowhead Springs provides for a mixture of residences, commercial, recreational, and service uses in a 500-acre area. The system of multi-purpose trails, accommodating pedestrian, bicycle, and equestrian users, are interconnected and allow a convenient alternative to the automobile.

Table 5.8-5
Consistency with SCAG Regional Policies

SCAG Policy	Compliance with Policy	Sample Related Goal or Policy-GP Update	Sample Related Goal or Policy – AHS SP
		12.6.6 Continue to cooperate with Omnitrans and the Rapid Transit District to expand as necessary the comprehensive mass transit system for the City to reduce vehicular travel.	
Ensure travel safety and reliability for all people and goods in the region.	The Circulation and Parks, Recreation, and Trails Elements provide guidance and policies that promote the safe movement of people and goods with importance placed on pedestrian safety as well as vehicular safety.	Goal 6.3 Provide a safe circulation system. 6.3.5 Limit direct access from adjacent private properties to arterials to maintain an efficient and desirable quality of traffic flow 8.3.9 Separate bikeway and trail systems from traffic and roadways wherever possible.	The roadways within Arrowhead Springs comply with the City's circulation standards and General Plan Circulation system.
Preserve and ensure a sustainable regional transportation system.	The Circulation and Parks, Recreation, and Trails Elements encourage regional coordination of mobility issues.	6.4.3 Continue to participate in forums involving the various governmental agencies such as Caltrans, SANBAG, SCAG, and the County that are intended to evaluate and propose solutions to regional transportation problems. 8.3.1 Work cooperatively with appropriate regional agencies to facilitate development of interconnected trails that tie into major activity areas.	Arrowhead Springs includes approximately 1,400 acres of Open Space/ Watershed uses that accommodate both regional and local multi-purpose trails. In addition, a system of bike lanes and trails are located throughout the developable area to provide a viable option to the automobile.
Maximize the productivity of our transportation system.	The Circulation Element contains policies intended to improve the City's transportation system.	6.2.1 Maintain a peak hour level of service D or better at street intersections. 6.2.2 Design each roadway with sufficient capacity to accommodate anticipated traffic based on intensity of projected and planned land use in the City and the region while maintaining a peak hour level of service (LOS) "D" or better.	The roadways within Arrowhead Springs comply with the City's circulation standards and General Plan Circulation system.

Table 5.8-5
Consistency with SCAG Regional Policies

SCAG Policy	Compliance with Policy	Sample Related Goal or Policy-GP Update	Sample Related Goal or Policy – AHS SP
		6.3.1 Promote the principle that streets have multiple uses and users, and protect the safety of all users.	
Protect the environment, improve air quality and promote energy efficiency.	Several elements, such as the Circulation, Natural Resources and Conservation, and Energy and Water Conservation Elements encourage preservation of the natural environment as well as improved air quality through regional coordination and the development on non-motorized forms of travel.	6.6.1 Support the efforts of regional, state, and federal agencies to provide additional local and express bus service in the City. 6.7.1 Accommodate railroad services that allow for the movement of people and goods while minimizing their impact on adjacent land uses. Goal 8.3 Develop a well-designed system of interconnected multi-purpose trails, bikeways, and pedestrian paths. 12.6.7 Promote the use of public transit and alternative travel modes to reduce air emissions. 13.1.2 Ensure the incorporation of energy conservation features in the design of all new construction and site development in accordance with State Law.	Arrowhead Springs accommodates both vehicular and non-motorized forms of transportation on an extensive network of roadways and multi-purpose trails. Arrowhead Springs dedicates approximately 1,400 acres as open space and watershed, which is intended to protect and preserve existing biological and water resources. Existing valleys, watercourses, and ridgelines are largely untouched and preserved outside of the 27% of the site proposed for development.
Encourage land use and growth patterns that complement our transportation investments.	The Circulation, Parks, Recreation and Trails, and Natural Resources and Conservation are consistent with regional policies and plans, and contain policies that promote coordination of the City's transit system with regional transportation services.	2.3.7 Improvements shall be made to transportation corridors that promote physical connectivity and reflect consistently high aesthetic values. Goal 8.3 Develop a well-designed system of interconnected multi-purpose trails, bikeways, and pedestrian paths. 12.6.1 Promote a pattern of land uses which locates residential uses in close proximity to employment and commercial services and provides, to the fullest extent possible, local job	Arrowhead Springs concentrates development to 27% of the total site and accommodates both vehicular and non-motorized forms of transportation on an extensive network of roadways and multi-purpose trails.

Table 5.8-5
Consistency with SCAG Regional Policies

SCAG Policy	Compliance with Policy	Sample Related Goal or Policy-GP Update	Sample Related Goal or Policy – AHS SP
		opportunities and commercial service to minimize vehicular travel and associated air emissions.	
Transportation investments shall be based on SCAG's adopted Regional Performance Indicators: *Mobility* • Average daily speed • Average daily delay *Accessibility* • Percent PM peak work trips within 45 minutes of home • Distribution of work trip travel times *Reliability* • Percent variation in travel time *Safety* • Accident rates Cost effectiveness • Benefit-to-cost ratio *Productivity* • Percent capability utilized during peak conditions *Sustainability* • Total cost per capita to sustain current system performance *Preservation* • Maintenance cost per capita to preserve system at base year conditions	The Circulation and Natural Resources and Conservation Elements provide guidance through its policies and programs regarding traffic, circulation and parking within the City. SCAG policies, including the Regional Transportation Plan, were taken into account in the creation of the Circulation Element.	6.4.3 Continue to participate in forums involving the various governmental agencies such as Caltrans, SANBAG, SCAG, and the County that are intended to evaluate and propose solutions to regional transportation problems. 12.7.1 Cooperate with the South Coast Air Quality Management District and incorporate pertinent local implementation provisions of the Air Quality Management Plan. 12.7.2 Work with the South Coast Air Quality Management District to establish controls and monitor uses in the City that could add to the air basin's degradation (e.g. auto repair, manufacturers). 12.7.3 Coordinate with SCAQMD to ensure that all elements of air quality plans regarding reduction of air pollutant emissions are being enforced.	The roadways within Arrowhead Springs comply with the City's circulation standards and General Plan Circulation system.

Table 5.8-5
Consistency with SCAG Regional Policies

SCAG Policy	Compliance with Policy	Sample Related Goal or Policy-GP Update		Sample Related Goal or Policy – AHS SP
Environmental • Emissions generated by travel *Environmental Justice* • Expenditures by quintile and ethnicity • Benefit vs. burden by quintiles				
Ensuring safety, adequate maintenance, and efficiency of operations on the existing multi-modal transportation system will be RTP priorities and will be balanced against the need for system expansion investments.	The Circulation Element provides guidance through its policies and programs regarding traffic, circulation and parking within the City. SCAG policies, including the Regional Transportation Plan, were taken into account in the creation of the Circulation Element.	6.4.3	Continue to participate in forums involving the various governmental agencies such as Caltrans, SANBAG, SCAG, and the County that are intended to evaluate and propose solutions to regional transportation problems.	The roadways within Arrowhead Springs comply with the City's circulation standards and General Plan Circulation system.
RTP land use and growth strategies that differ from currently expected trends will require a collaborative implementation program that identifies required actions and policies by all affected agencies and sub-regions.	The Circulation Element provides guidance through its policies and programs regarding traffic, circulation and parking within the City. SCAG policies, including the Regional Transportation Plan, were taken into account in the creation of the Circulation Element.	6.4.3	Continue to participate in forums involving the various governmental agencies such as Caltrans, SANBAG, SCAG, and the County that are intended to evaluate and propose solutions to regional transportation problems.	No policies in the Arrowhead Springs Specific Plan are applicable.
HOV gap closures that significantly increase transit and rideshare usage will be supported and encouraged, subject to Policy #1.	The Circulation Element provides guidance through its policies and programs regarding traffic, circulation and parking within the City. SCAG policies, including the Regional Transportation Plan, were taken into account in the creation of the Circulation Element.	6.3.1 Goal 8.3	Promote the principle that streets have multiple uses and users, and protect the safety of all users. Develop a well-designed system of interconnected multi-purpose trails, bikeways, and pedestrian paths	The roadways within Arrowhead Springs comply with the City's circulation standards and General Plan Circulation system.
Air Quality Chapter				
Policy 5.07: Determine specific programs and associated actions needed (e.g., indirect source rules, enhanced use of telecommunications, provision of demand management-based	The Circulation Element provides guidance through its policies and programs regarding traffic, circulation and parking within the City. SCAG policies, including the Regional Transportation Plan, were taken into account in the creation of the Circulation Element.	6.4.3	Continue to participate in forums involving the various governmental agencies such as Caltrans, SANBAG, SCAG, and the County that are intended to evaluate and propose solutions to regional transportation problems.	No policies in the Arrowhead Springs Specific Plan are applicable.

Table 5.8-5
Consistency with SCAG Regional Policies

SCAG Policy	Compliance with Policy	Sample Related Goal or Policy-GP Update		Sample Related Goal or Policy – AHS SP
programs, or vehicle-miles-traveled/emission fees) so that options to command and control regulations can be assessed.				
Policy 5.11: Through the environmental document review process, ensure that plans at all levels of government (regional, air basin, county, subregional and local) consider air quality, land use, transportation and economic relationships to ensure consistency and minimize conflicts.	The Circulation and Natural Resources and Conservation Elements provide guidance and policies on air quality and coordinate the planning of land use, circulation, housing and other City policies and their potential effects on air quality.	12.7.1	Cooperate with the South Coast Air Quality Management District and incorporate pertinent local implementation provisions of the Air Quality Management Plan.	The Arrowhead Springs Specific Plan is consistent with the City of San Bernardino's General Plan.
		12.7.2	Work with the South Coast Air Quality Management District to establish controls and monitor uses in the City that could add to the air basin's degradation (e.g. auto repair, manufacturers).	
		12.7.3	Coordinate with SCAQMD to ensure that all elements of air quality plans regarding reduction of air pollutant emissions are being enforced.	
Open Space Chapter				
Policy 9.01: Provide adequate land resources to meet the outdoor recreation needs of the present and future residents in the region and to promote tourism in the region.	The Land Use and Parks, Recreation, and Trails Elements provide guidance and policies on the recreational needs of the community and the promotion of tourism.	2.3.5	Capitalize on cultural events, such as the Route 66 Rendezvous, to help market and build a distinct identity for the City.	The Arrowhead Springs Specific Plan provides for a resort/residential development centered on the existing Arrowhead Springs Hotel and Resort/Spa. Arrowhead Springs includes a unique diversity of uses including 1,350 single-family detached and multi-family units; 1,044,646 square feet of commercial and office uses; a 199-acre, 18-hole public golf course; the reuse of the historic Arrowhead Springs Hotel; a new 300-room hotel; a conference center; and the reuse and expansion of the historic Arrowhead Springs spa/resort.
		2.3.9	Facilitate the improvement and expansion of the National Orange Show, including the formulation of a master plan that addresses on-site and surrounding uses, access, and design	
		8.1.6	Accommodate the recreational needs of the City's residents reflecting their unique social, cultural, ethnic, and physical limitations in the design and programming of recreational spaces and facilities.	

Table 5.8-5
Consistency with SCAG Regional Policies

SCAG Policy	Compliance with Policy	Sample Related Goal or Policy-GP Update	Sample Related Goal or Policy – AHS SP
Policy 9.02: Increase the accessibility to open space lands for outdoor recreation.	The Parks, Recreation, and Trails Element provides policies guiding the improvement of access to open space and recreational opportunities.	Goal 8.3 Develop a well-designed system of interconnected multi-purpose trails, bikeways, and pedestrian paths 8.1.5 Integrate parks and recreation facilities with the Master Plan for Trails and Bikeways. (PRT-1)	Arrowhead Springs includes 21 acres of Neighborhood/Mini-Parks, 1,400 acres of open space, and a 199-acre public golf course interconnected by an extensive network of multi-purpose trails.
Policy 9.03: Promote self-sustaining regional recreation resources and facilities.	The Parks, Recreation, and Trails and Natural Resources and Conservation Elements provide guidance and policies that promote regional recreation resources.	8.2.5 Design and develop parks to complement and reflect their natural environmental setting and maximize their open space character. 12.3.4 Preserve and enhance the natural characteristics of the Santa Ana River, City Creek, and Cajon Creek as habitat areas.	Arrowhead Springs includes 21 acres of Neighborhood/Mini-Parks, 1,400 acres of open space, and a 199-acre public golf course interconnected by an extensive network of multi-purpose trails.
Policy 9.04: Maintain open space for adequate protection of lives and properties against natural and man-made hazards.	The Land Use and Safety Elements address the important function of open space as a buffer to separate people and buildings from hazards.	2.2.4 Hillside development and development adjacent to natural areas shall be designed and landscaped to preserve natural features and habitat and protect structures from the threats from natural disasters, such as wildfires and floods. 10.11.2 Work with the U.S. Forest Service and private landowners to ensure that buildings are constructed, sites are developed, and vegetation and natural areas are managed to minimize wildfire risks in the foothill areas of the City.	Arrowhead Springs concentrates development to 27% of the total site. The majority of proposed development is outside of the Alquist-Priolo fault zones. New development in Arrowhead Springs will comply with the requirements of the City's Foothill Fire Zone, which addresses building and landscaping standards in hazardous fire areas.
Policy 9.05: Minimize potentially hazardous developments in hillsides, canyons, areas susceptible to flooding, earthquakes, wildfire and other known hazards, and areas with limited access for emergency	The Land Use and Safety elements provides adequate policy direction that address protection from natural and man-made disasters.	2.2.4 Hillside development and development adjacent to natural areas shall be designed and landscaped to preserve natural features and habitat and protect structures from the threats from natural disasters, such as wildfires and floods. See response to Policy 3.22 above.	The Hillside Development standards in the Specific Plan ensure that development occurs in a manner that protects the hillside's natural and topographic character and safety. The San Andres fault is located along the southern portion of the Plan area. The majority of

Table 5.8-5
Consistency with SCAG Regional Policies

SCAG Policy	Compliance with Policy	Sample Related Goal or Policy-GP Update	Sample Related Goal or Policy – AHS SP
equipment.			proposed development is located outside of the designated Alquist-Priolo fault zones. Structures proposed within the Alquist-Priolo fault zones will comply with requirements of the Alquist-Priolo act and the City's building codes.
Policy 9.06: Minimize public expenditure for infrastructure and facilities to support urban type uses in areas where public health and safety could not be guaranteed.	The Land Use Element contains several policies that encourage infill development, thereby reducing the need to expand existing infrastructure and facilities.	2.3.2 Promote development that is compact, pedestrian-friendly, and served by a variety of transportation options along major corridors and in key activity areas.	Arrowhead Springs concentrates development to 27% of the total site. The majority of proposed development is outside of the Alquist-Priolo fault zones. New development in Arrowhead Springs will comply with the requirements of the City's Foothill Fire Zone, which addresses building and landscaping standards in hazardous fire areas.
Policy 9.07: Maintain adequate viable resource production lands, particularly lands devoted to commercial agriculture and mining operations.	The Natural Resources and Conservation Element provides guidance for monitoring mineral resource production in the City.	Goal 12.4 Properly manage designated areas for mineral extraction to meet the needs of the area.	No agricultural or mining operations exist within Arrowhead Springs.
Policy 9.08: Develop well-managed viable ecosystems or known habitats of rare, threatened and endangered species, including wetlands.	The Natural Resources and Conservation Element provides numerous policies that support the management, protection and conservation of natural habitats.	12.1.2 Site and develop land uses in a manner that is sensitive to the unique characteristics of and that minimizes the impacts upon sensitive biological resources. 12.2.3 Pursue voluntary open space or conservation easements to protect sensitive species or their habitats. Goal 12.3 Establish open space corridors between and to protected wildlands.	Arrowhead Springs Specific Plan dedicates approximately 1,400 acres, or 73% of the total site, as open space and watershed, which is intended to protect and preserve existing biological and water resources. Existing valleys, watercourses, and ridgelines are largely untouched and actually preserved outside of the 27% of the site proposed for development

Table 5.8-5
Consistency with SCAG Regional Policies

SCAG Policy	Compliance with Policy	Sample Related Goal or Policy-GP Update	Sample Related Goal or Policy – AHS SP
Water Quality Chapter			
Policy 11.07: Encourage water reclamation throughout the region where it is cost-effective, feasible, and appropriate to reduce reliance on imported water and wastewater dis-charges. Current administrative impediments to increased use of wastewater should be addressed.	The Energy and Water Conservation Element provides guidance and policies that encourage water conservation and related strategies.	13.2.4 Require the use of reclaimed water for landscape irrigation and other non-contact uses for industrial projects, golf courses, and freeways.	Arrowhead Springs will utilize high efficiency irrigation technology and reclaimed site water in order to reduce potable water consumption for irrigation by approximately 40% -50% over conventional means.
Growth Visioning			
Principle 1: Improve mobility for all residents • Encourage transportation investments and land use decisions that are mutually supportive. • Locate new housing near existing jobs and new jobs near existing housing • Encourage transit-oriented development • Promote a variety of travel choices	The General Plan Update provides polices that encourage the use of transit as well as other strategies to increase mobility.	See the response to SCAG Policies 3.12, 3.13, and 3.16 in this table.	Arrowhead Springs concentrates development of residential uses, commercial services, and recreation into 27% of the total site. Arrowhead Springs accommodates both vehicular and nonmotorized forms of transpor-tation on an extensive network of roadways and multi-purpose trails.
Principle 2: Foster livability in all communities • Promote infill development and redevelopment to revitalize existing communities. • Promote developments, which provide a mix of uses. • Promote "people scaled", walkable communities	The Land Use and the Community Design Elements encourage improved livability including but not limited to infill development, street design, gathering places.	See the response to SCAG Policies 3.05 and 3.12 in this table.	Development in Arrowhead Springs is concentrated on 27% of the site, mainly in or near the areas of existing development. Arrowhead Springs concentrates 1,350 new single-family detached and multi-family units; 1,044,646 square feet of existing and new commercial and office uses; a new 18-hole public golf course; the reuse of the historic Arrowhead Springs Hotel; a new 300-room hotel; a new and reuse

Table 5.8-5
Consistency with SCAG Regional Policies

SCAG Policy	Compliance with Policy	Sample Related Goal or Policy-GP Update	Sample Related Goal or Policy – AHS SP
• Support the preservation of stable, single-family neighborhoods.			of the existing conference center; and the reuse and expansion of the historic Arrowhead Springs spa/resort.
Principle 3: Enable prosperity for all people • Provide, in each community, a variety of housing types to meet the housing needs of all income levels. • Support educational opportunities that promote balanced growth. • Ensure environmental justice regardless of race, ethnicity, or income class. • Support local and state fiscal policies that encourage balanced growth. • Encourage civic engagement.	Various elements of the General Plan Update, including the Housing Element, provide policies to improve community prosperity.	See the response to SCAG Policies 3.24 and 3.27 in this table.	Arrowhead Springs accommodates 1,350 new residential units that provide housing opportunities for multiple segments of the housing market, from first time buyers, to executive homes, to condominiums and multi-family units. Arrowhead Springs accommodates 36 custom estates, 34 "urban" flats in Village Walk, 266 condominiums and townhomes adjacent to Village Walk, 150 upscale senior units, 150 non-age-restricted attached units, 429 golf course condominiums, and 285 townhomes and condominiums in the unique Hilltown.
Principle 4: Promote sustain-ability for future generations • Preserve rural, agricultural, recreational and environ-mentally sensitive areas. • Focus development in urban centers and existing cities. • Develop strategies to accommodate growth that uses resources efficiently, eliminate pollution, and significantly reduce waste. • Utilize "green" development techniques.	The General Plan Update contains policies in several different elements that promote sustainability and the preservation of resources in the City.	See the response to SCAG Policies 3.05, 3.09, 3.12, 3.18, 3.20, 3.21, 3.22, 9.03, 9.08, and 11.07 in this table.	Arrowhead Springs dedicates approximately 1,400 acres as open space and watershed, which is intended to protect and preserve existing biological and water resources. This area represents over 73% of the Arrowhead Springs property. Existing valleys, watercourses, and ridgelines are largely untouched and actually preserved outside of the 27% of the site proposed for development.

Source: Southern California Association of Governments.

Adjacent Jurisdictions

The City of San Bernardino is surrounded by the Cities of Rialto to the west, Colton to the southwest, Loma Linda to the south, Redlands to the southeast, Highland to the east, and the San Bernardino National Forest to the north. Along the boundaries shared with these jurisdictions and agencies is a full array of developed and undeveloped land uses and shared roadways. No land use changes are proposed along any of these borders except with the National Forest to the north. In this area, land use changes are proposed to accommodate the Arrowhead Springs Specific Plan, to reflect the adopted Paradise Hills Specific Plan, and in Verdemont to reflect shifts in the residential land use designations and the presence of the Devil's Canyon reservoir.

GP IMPACT 5.8-3: IMPLEMENTATION OF THE GENERAL PLAN WOULD NOT CONFLICT WITH ADOPTED HABITAT CONSERVATION PLAN(S). [THRESHOLD LU-3]

Impact Analysis: The County of San Bernardino has not adopted Habitat Conservation Plans in or near the City of San Bernardino. The City's Development Code addresses the development standards and uses for specific areas within the City.

Relevant Policies and Programs

Proposed General Plan policies related to the preservation or enhancement of the established community and its physical character:

Land Use Element

Policy 2.1.1: Actively enforce development standards, design guidelines, and policies to preserve and enhance the character of San Bernardino's neighborhoods.

Policy 2.2.1: Ensure compatibility between land uses and quality design through adherence to the standards and regulations in the Development Code and policies and guidelines in the Community Design Element.

Policy 2.4.1: Quality infill development shall be accorded a high priority in the commitment of City resources and available funding.

Policy 2.4.2: Continue to provide special incentives and improvement programs to revitalize deteriorated housing stock, residential neighborhoods, major business corridors and employment centers.

Policy 2.4.3: Where necessary to stimulate the desired mix and intensity of development, land use flexibility and customized site development standards shall be achieved through various master-planning devices such as specific plans, planned development zoning ,and creative site planning.

Community Design Element

Policy 5.3.6: Provide for streetscape improvements, landscape, and/or signage that uniquely identify architecturally or historically significant residential neighborhoods.

Policy 5.5.1: Require new and in-fill development to be of compatible scale and massing as existing development yet allow the flexibility to accommodate unique architecture, colors and materials individual projects.

Proposed General Plan policies related to interagency and inter-jurisdictional coordination include:

Land Use Element

Policy 2.2.5: Establish and maintain an ongoing liaison with Caltrans, the railroads, and other agencies to help minimize impacts and improve aesthetics of their facilities and operations; including possible noise walls, berms, limitation on hours and types of operations, landscaped setbacks and decorative walls along its periphery.

Policy 2.2.6: Establish and maintain an ongoing liaison with the County of San Bernardino to conform development projects within the City's sphere of influence to the City's General Plan.

Policy 2.5.2: Continue collaboration with the San Manuel Indians and County of San Bernardino to achieve acceptable development quality within San Bernardino's sphere of influence.

Policy 2.5.3: Partner with the San Manuel Indians to jointly promote opportunities in the area and to address the needs of future developments in areas surrounding tribal lands.

Policy 2.7.2;: Work with the San Bernardino Valley Municipal Water District to create additional water storage capacity and take advantage of the abundant water supplies.

Proposed General Plan policies related to the San Bernardino International Airport include the following:

Policy 2.9.1: Require that all new development be consistent with the adopted Comprehensive Land Use Plan for the San Bernardino International Airport and ensure that no structures or activities encroach upon or adversely affect the use of navigable airspace.

Policy 2.9.2: Refer any adoption or amendment of this General Plan, specific plan, zoning ordinance, or building regulation within the planning boundary of the adopted Comprehensive Airport Master Plan for the SBIA to the airport authority as provided by the Airport Land Use Law.

Policy 2.9.3: Limit the type of development, population density, maximum site coverage, and height of structures as specified in the applicable safety zones in the Comprehensive Land Use Plan for the SBIA and as shown on Figure LU-4.

Policy 2.9.4: Limit the development of sensitive land uses (e.g. residential, hospitals, schools) within the 65 dB Community Noise Equivalent Level (CNEL) contour, as shown on Figure LU-4.

Policy2.9.5: Ensure that the heights of structures do not impact navigable airspace, as defined in the Comprehensive Land Use Plan for the SBIA.

Policy 2.9.6: As required by State Law for real estate transactions within the Airport Influence Area, as shown on Figure LU-4, require notification/disclosure statements to alert potential buyers and tenants of the presence of and potential impacts from the San Bernardino International Airport.

Noise Element

Policy 14.2.1: Work with Caltrans to landscape or install mitigation elements along freeways and highways adjacent to existing residential subdivisions or noise-sensitive uses to reduce noise impacts.

Policy 14.2.5: Require sound walls, berms, and landscaping along existing and future highways and railroad right-of-ways to beautify the landscape and reduce noise.

Policy 14.2.6: Buffer residential neighborhoods from noise caused by train operations and increasing high traffic volumes along major arterials and freeways.

Policy 14.2.7: Require heliports/helistops to comply with Federal Aviation Administration standards.

Proposed General Plan policies related to the preservation of natural habitats in the San Bernardino area:

Land Use Element

Policy 2.1.2: Require that new development with potentially adverse impacts on existing neighborhoods or residents such as noise, traffic, emissions, and storm water runoff, be located and designed so that quality of life and safety in existing neighborhoods are preserved.

Policy 2.2.2: Require new uses to provide mitigation or buffers between existing uses where potential adverse impacts could occur, including, as appropriate, decorative walls, landscape setbacks, restricted vehicular access, enclosure of parking structures to prevent sound transmission, and control of lighting and ambient illumination.

Policy 2.2.4: Hillside development and development adjacent to natural areas shall be designed and landscaped to preserve natural features and habitat and protect structures from the threats from natural disasters, such as wildfires and floods.

Policy 2.2.10: The protection of the quality of life shall take precedence during the review of new projects. Accordingly, the City shall utilize its discretion to deny or require mitigation of projects that result in impacts that outweigh benefits to the public.

Policy 2.6.2: Balance the preservation of plant and wildlife habitats with the need for new development through site plan review and enforcement of the California Environmental Quality Act (CEQA).

Natural Resources Element

Policy12.1.2: Site and develop land uses in a manner that is sensitive to the unique characteristics of and that minimizes the impacts upon sensitive biological resources.

Policy 12.1.3: Require that all proposed land uses in the “Biological Resource Management Area” (BRM), Figure NRC-1, be subject to review by the Environmental Review Committee (ERC).

Policy 12.2.1: Prohibit development and grading within fifty (50) feet of riparian corridors, as designated in Figure NRC-1 unless no feasible alternative exists.

Programs

The Corridor Improvement program is an optional package of policy, regulatory and incentive programs that, if applied, are intended to stimulate private investment and result in desired development within the Corridor Strategic Areas. This is accomplished by providing optional incentives, in the form of density bonuses and varied development standards, to developments that qualify.

- Promote downtown revitalization by seeking and facilitating mixed-use projects (e.g. combinations of residential, commercial and office uses).
- Accommodate residential units above the first floor of commercial structures provided that: a) the impacts of noise, odor, and other characteristics of commercial activity can be adequately mitigated; and b) a healthy, safe, and well-designed living environment with a complement of amenities can be achieved for the residential units.

5.8.3.2 Arrowhead Springs Specific Plan

AHS IMPACT 5.8-1: IMPLEMENTATION OF THE ARROWHEAD SPRINGS SPECIFIC PLAN WOULD NOT DIVIDE AN ESTABLISHED COMMUNITY. [THRESHOLD LU-1]

Impact Analysis: The land use plan concentrates development on 27 percent of the total site near the areas of existing development. Three hundred sixty-eight acres of the Arrowhead Springs Specific Plan area are currently located in the incorporated City. The remaining 1,548 acres are located in unincorporated County of San Bernardino. There is one existing dwelling unit within the incorporated portion and ten units in the unincorporated portion of the Specific Plan. Ten of these units are part of the hotel and were intended as temporary housing. A few units are used by maintenance staff as permanent housing. Currently, there are nine permanent residents that also work at Arrowhead Springs. Employment at Arrowhead Springs consists of maintenance and security staff and the offices of the American Development Group. During the business week, there are twenty employees on-site. No permanent community exists on-site.

AHS IMPACT 5.8-2: IMPLEMENTATION OF THE ARROWHEAD SPRINGS SPECIFIC PLAN WOULD NOT CONFLICT WITH APPLICABLE PLANS ADOPTED FOR THE PURPOSE OF AVOIDING OR MITIGATING AN ENVIRONMENTAL EFFECT. [THRESHOLD LU-2]

Impact Analysis: The Arrowhead Springs Specific Plan addresses the orderly population growth within 1,916 acres partially within and outside of the City's jurisdictional boundaries. Three hundred sixty-eight acres of the Arrowhead Springs Specific Plan area are currently located in the incorporated City. The remaining 1,548 acres are located in unincorporated County of San Bernardino.

At build-out, the Arrowhead Springs Specific Plan would accommodate 1,350 residential units. Based on a factor of 3.340 persons per household and an adjustment for senior units[1], the projected population at build-out for the Specific Plan would be approximately 4,233 people. This would account for 1.3 percent of the population and 1.4 percent of the housing units at build-out of the City's total planning area. While there is no standard for comparison, the proportions of population and housing resulting from build-out of Arrowhead Springs are not in themselves significant.

Arrowhead Springs provides 1,350 new residential units, including 36 single-family units and 1,314 attached and multi-family units. This mixture is vastly different than what currently exists in the City. The 2000 Decennial Census found that the housing stock in the City was 58.8 percent single-family, 4.3 percent single-family attached, 29.8 percent multi-family, 6.9 percent mobile homes, and 0.2 percent other types of units (boats, recreational vehicles, vans, etc). On the other hand, single-family homes in Arrowhead Springs account for 2.7 percent of the total units while multi-family units account for 97.3 percent of the units.

The Specific Plan would also accommodate the development of 1,044,646 square feet of non-residential uses, which includes 235,996 square feet of existing and 808,650 square feet of new commercial uses. At build out, the land use plan for the total planning area could generate approximately 2,530 jobs. Based upon the 2000 Census, the City of San Bernardino has an 11.3 percent housing vacancy rate. However, due to the unique nature and mixture of product in Arrowhead Springs, a 5 percent vacancy rate has been assumed for the Specific Plan. Given the 5 percent vacancy rate, Arrowhead Springs may realize 1,283 households. At build-out, Arrowhead Springs would have a jobs-to-household factor of 1.97 and would be considered jobs-rich. SCAG projections indicate that the City as a whole will be jobs-rich in 2025 (2.05 jobs-to-household ratio) and the build-out projections for the proposed General Plan show a greater level of jobs-to-households (4.67 jobs-to-household ratio). The Specific Plan contributes slightly to this overall jobs-to-households imbalance in the City but helps reduce the housing imbalance in the region. Therefore, development of the

[1] In the Senior Village (RM-SV), it is assumed that 150 units will be restricted to seniors (1.5 persons per unit) and 150 units will not be age restricted (3.340 persons per unit)

Arrowhead Springs Specific Plan would present a minimal conflict with applicable plans. Please see Table 5.8-5 for consistency with SCAG policies.

AHS IMPACT 5.8-3: IMPLEMENTATION OF THE ARROWHEAD SPRINGS SPECIFIC PLAN WOULD NOT CONFLICT WITH ADOPTED HABITAT CONSERVATION PLAN(S). [THRESHOLD LU-3]

Impact Analysis: The County of San Bernardino has not adopted Habitat Conservation Plans in or near the City of San Bernardino or the Arrowhead Springs specific Plan area

5.8.4 Existing Regulations and Standard Conditions

There are no existing regulations or standard conditions related to land use and planning that apply to the proposed General Plan Update or the Arrowhead Springs Specific Plan.

5.8.5 Level of Significance Before Mitigation

Upon implementation of regulatory requirements, and standard conditions of approval, the following impacts would be less than significant before mitigation:

GP Impact 5.8-1 Implementation of the General Plan would not result in the physical division of an established community. The General Plan would preserve and enhance the community while intensifying commercial uses. One of the primary purposes of the General Plan is to minimize the impacts of land use changes to adjacent areas and to ensure the compatibility of these uses. The Land Use Element of the General Plan Update contains goals and policies that encourage the preservation or enhancement of the existing community through infill development, enhanced landscaping, gateways, and pedestrian/bicycle connections, as well as the continuance of the City's resort/residential character and development of compatible uses that would enhance the existing character.

GP Impact 5.8-2 Implementation of the General Plan and would not conflict with applicable plans. The General Plan Update and University District Specific Plan are consistent with the ten core policies of SCAG's Regional Comprehensive Plan and Guide (RCPG) and ancillary/advisory policies that are relevant to the proposed project. In addition, the General Plan includes policies that address compatibility with and protection of the SBIA and the adopted Airport Influence Area is incorporated in the General Plan.

GP Impact 5.8-3 Since the County of San Bernardino has not adopted Habitat Conservation Plans in or near the City of San Bernardino, implementation of the General Plan would not conflict with adopted habitat conservation plan(s).

AHS Impact 5.8-1 There are 11 units located within Arrowhead Springs, of which 6 are temporarily occupied by employees of the facility. Since no permanent community exists on-site, implementation of the Arrowhead Springs specific plan would not divide an established community.

AHS Impact 5.8-2 Arrowhead Springs Specific Plan would not conflict with applicable plans. The Arrowhead Springs Specific Plan would be consistent with the ten core policies of SCAG's Regional Comprehensive Plan and Guide (RCPG) and ancillary/advisory policies that are relevant to the proposed project.

AHS Impact 5.8.3 Since the County of San Bernardino has not adopted Habitat Conservation Plans in or near the Arrowhead Springs Specific Plan, implementation of the Specific Plan would not conflict with adopted habitat conservation plan(s).

5.8.6 Mitigation Measures

No significant impacts were identified for either the General Plan update or the Arrowhead Springs Specific Plan and no mitigation measures are necessary.

5.8.7 Level of Significance After Mitigation

No mitigation measures are necessary.

5.9 MINERAL RESOURCES

This section of the EIR evaluates the potential for implementation of the City of San Bernardino General Plan Update, and the Arrowhead Springs Specific Plan to impact mineral resources in the City San Bernardino and its Sphere of Influence (SOI). This document focuses on those issues determined to be potentially significant as described in the Initial Study completed for this project (See Appendix A).

The analysis in this section is based in part on the following technical report(s):

- *City of San Bernardino General Plan*, Envicom Corporation, Adopted June 2, 1989,
- *DMG Open-File Report 94-08*, Department of Conservation, Division of Mines and Geology, 1995

Minerals are defined as any naturally occurring chemical elements or compounds, formed from inorganic processes and organic substances. Minable minerals or an "ore deposit" is defined as a deposit of ore or mineral having a value materially in excess of the cost of developing, mining and processing the mineral and reclaiming the project area. Mineral resources are an integral part of development and economic well-being of a city or county. The wise conservation, extraction and processing of those mineral resources is essential to meeting the needs of society.

Mineral deposits are important to many industries, including construction, transportation, and chemical processing. The first mineral commodity selected by the State Mining and Geology Board for classification by the State Geologist was construction aggregate-sand, gravel, and crushed rock. The value of mineral deposits is enhanced by their close proximity to urban areas; however, these mineral deposits are endangered by the same urbanization that enhances their value. The non-renewable characteristic of mineral deposits necessitates the careful and efficient development of mineral resources to prevent the unnecessary waste of these deposits due to careless exploitation and uncontrolled urbanization.

Mineral Resource Classification

The California Geological Survey Mineral Resources Project provides information about California's non-fuel mineral resources. The Mineral Resources Project classifies lands throughout the State that contain regionally significant mineral resources as mandated by the Surface Mining and Reclamation Act (SMARA) of 1975. Non-fuel mineral resources include metals such as gold, silver, iron, and copper; industrial metals such as boron compounds, rare-earth elements, clays, limestone, gypsum, salt and dimension stone; and construction aggregate including sand, gravel, and crushed stone. Development generally results in a demand for minerals, especially construction aggregate. The presence or absence of significant sand, gravel, or stone deposits that are suitable sources of aggregate are classified as Mineral Resource Zones (MRZs), as described below. The intent of classification is to assist lead agencies, planners, and the public in the wise use, management, and conservation of California's mineral resources. As California's population continues to expand, the demand for minerals, especially building construction such as aggregates, will similarly grow.

- ***MRZ-1*** – A Mineral Resource Zone where adequate information indicates that no significant mineral deposits are present or likely to be present.
- ***MRZ-2*** – A Mineral Resource Zone where adequate information indicates that significant mineral deposits are present, or a likelihood of their presence and development should be controlled.
- ***MRZ-3*** – A Mineral Resource Zone where the significance of mineral deposits cannot be determined from the available data.

- ***MRZ-4*** – A Mineral Resource Zone where there is insufficient data to assign any other MRZ designation.

5.9.1 Environmental Setting

5.9.2.1 San Bernardino General Plan

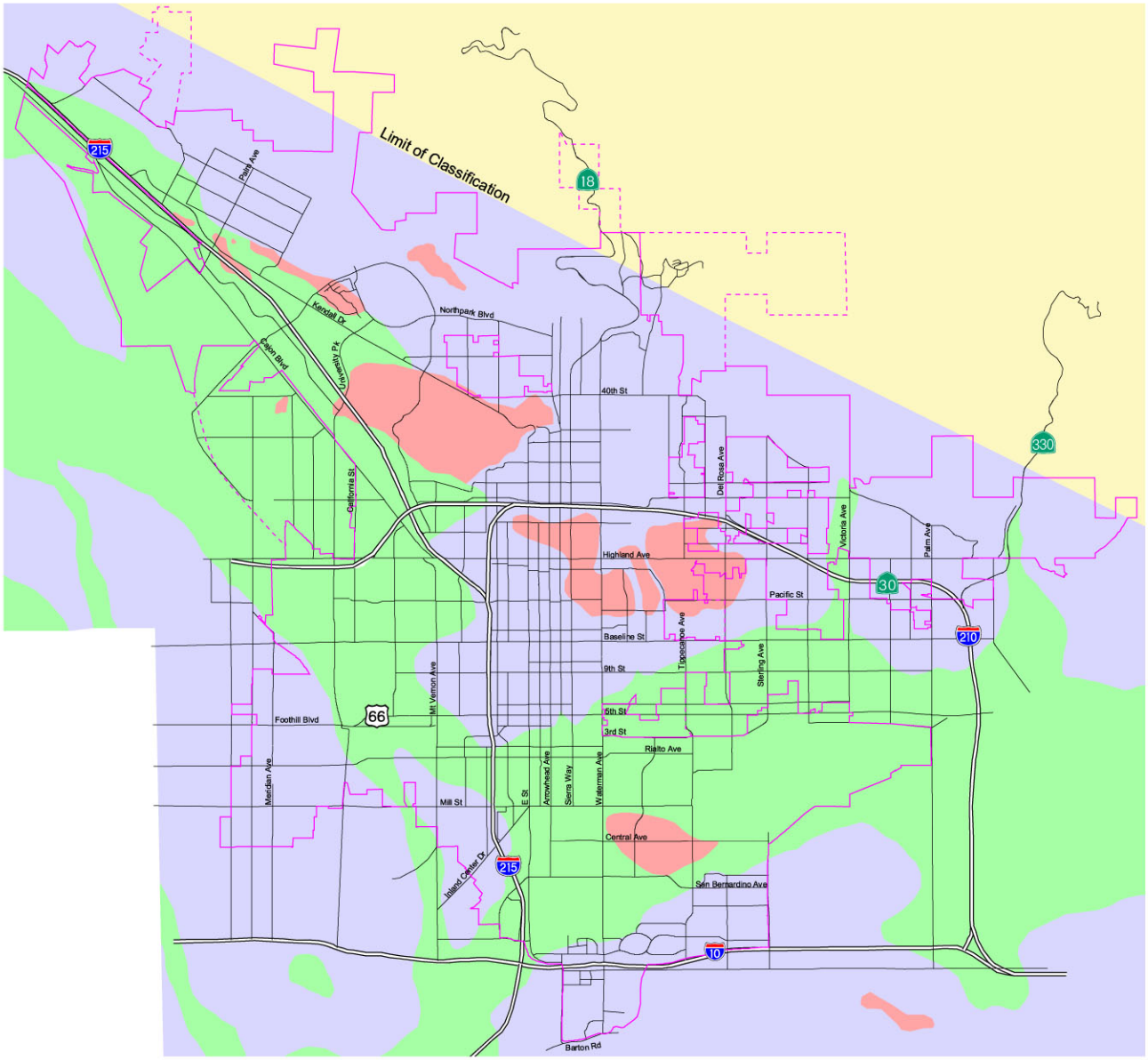
The City of San Bernardino lies on a broad, gently sloping lowland that flanks the southwest margin of the San Bernardino Mountains. The lowland is underlain by alluvial sediments eroded from bedrock in the adjacent mountains and washed by rivers and creeks into the valley region where they have accumulated in layers of gravel, sand, silt and clay. Sediment accumulation has continued for a few million years, during which time increasing thicknesses of sediments have gradually buried the original hill and valley topography of the Bunker Hill-San Timoteo Basin. Shandin Hills and other smaller hill areas in the basin are remnants of the original topography.

The San Bernardino Mountains, Shandin Hills, and other hilly areas are comprised predominantly of Mesozoic and older crystalline basement terrain. Younger sedimentary deposits consist of late Pleistocene alluvium outcropping on the older alluvial fans northeast of the City, and underlying the younger Holocene alluvium of the San Bernardino Valley. These younger sediments accumulated in two different depositional environments. Alluvial fans that extend downslope from the mouths of the San Bernardino Mountain canyons consist of coarser grained and more poorly sorted boulders, cobbles, gravels, sands, silts and clays that decrease in size and abundance to the southwest. Floodplain deposits from the Santa Ana River and Cajon and Lytle Creeks in the vicinity of metropolitan San Bernardino are comprised predominantly of sand, sandy silt, and silt. The alluvial fan and floodplain deposits interfinger and form a highly variable and often times laterally discontinuous layering of various sizes of alluvial materials.

The sediments accumulated in the alluvial fans and floodplain deposits described above have been classified by the California Department of Conservation, Division of Mines and Geology. In the San Bernardino City area, the bulk of construction aggregate is found in the natural sand and gravel deposits of Cajon Wash, Lytle Creek, Warm Creek, City Creek, and the Santa Ana River. Figure 5.9-1 depicts the MRZs as described earlier for the City of San Bernardino and its SOI and as classified in the 1995 California Department of Conservation, Division of Mines and Geology Open-File Report 94-08 (CDC-DMG). The primary goal of mineral resource classification is to identify regionally significant mineral deposits in an effort to conserve and develop them for anticipated aggregate production needs of the region. The remainder of the City is designated as MRZ-1 MRZ-3 and MRZ-4 zones.

The State of California designates a large meandering swath of MRZ-2 area predominately near the western and southern City boundaries. The MRZ-2 areas indicate the existence of construction aggregate deposits that meet certain State criteria for value and marketability based solely on geologic factors. By statute, the Board does not utilize “existing land uses” as a criterion in its classification of Mineral Resource Zones. This may often result in the classification of MRZs which are already developed in a variety of uses and intensities, rendering these areas unsuitable for mineral production. However, additional State studies in San Bernardino include the criteria of “existing land use.” This helps identify resource sectors that contain aggregate resources which remain potentially available from a land use perspective. The regionally significant construction aggregate sectors within City planning areas are depicted in Figure 5.9-2. Private lands within the City limit that are part of the significant construction aggregate sectors are designated IE, Industrial Extractive and IH, Industrial Heavy, to facilitate mineral resource development.

Mineral Resource Zones



MRZ-1 No Significant Mineral Deposits are Likely to be Present

MRZ-2 Significant Mineral Deposits are Likely, Development Should be Controlled

MRZ-3 Significant Mineral Deposits Cannot be Determined from Available Data

MRZ-4 Insufficient Data to Assign any other MRZ Designation

City Boundary

Sphere of Influence Boundary

Note: MRZs reflected and refined in the Industrial Extractive (IE) designation.

NOT TO SCALE

Source: California Dept. of Conservation, DMG, Open-File Report 94-08 (1995)

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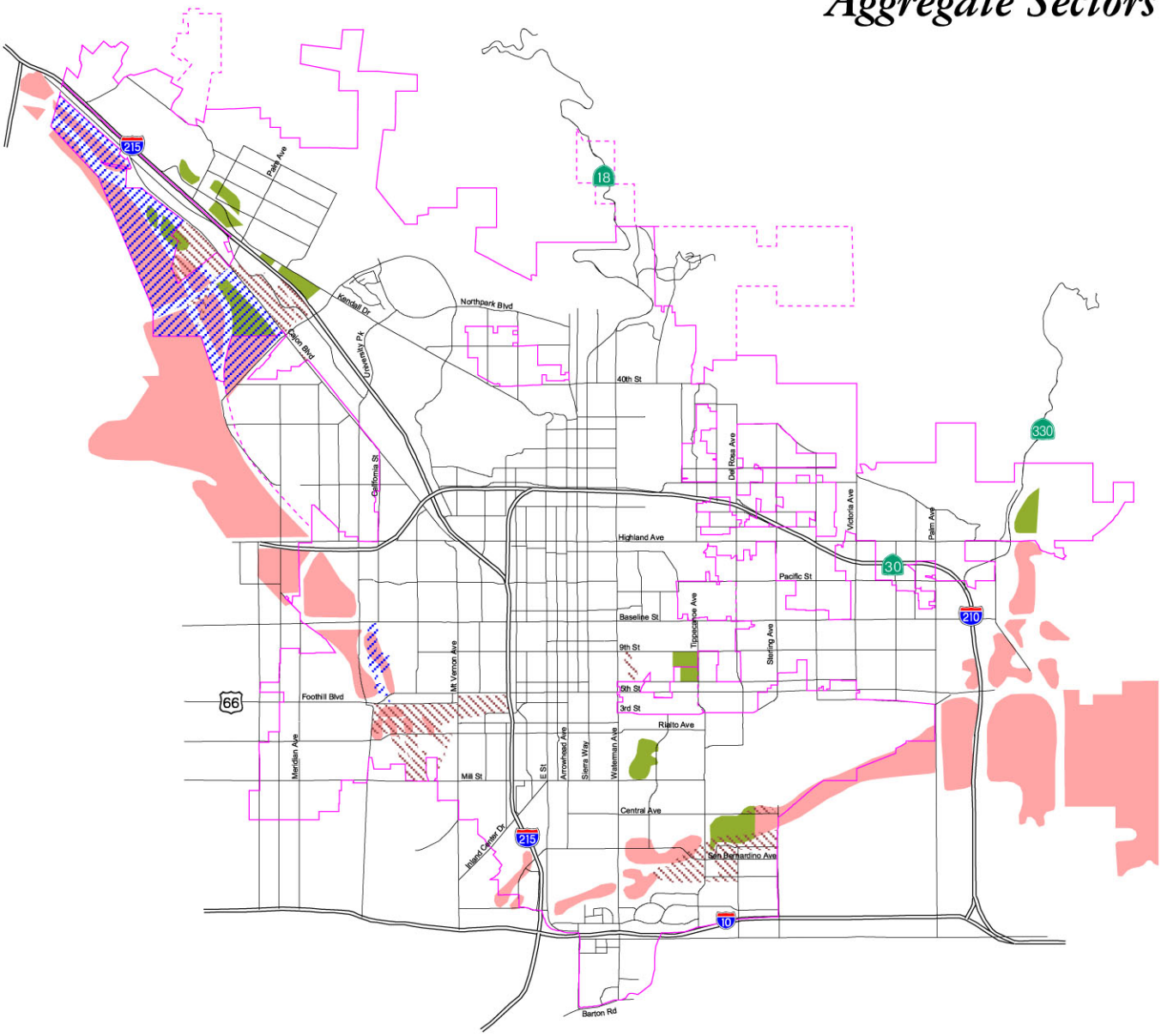
Regionally Significant Construction Aggregate Sectors



Construction Aggregate Sectors (Sand and Gravel)

Construction Aggregate Sectors Listed for Deletion in 1985

Existing Industrial Extraction (IE) Use Zone

Existing Industrial Heavy (IH) Use Zone

City Boundary

Sphere or Influence Boundary

NOT TO SCALE

Source: Envicom Corporation

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The presence of resource sectors require that a General Plan show the location of the sectors and incorporate policies for the management of their mineral resources. If a city proposes a land use that is incompatible with mineral extraction in or near resource sectors, it must reveal why the mineral resource is not being protected. In 1985, the City of San Bernardino requested deletion of 12 of their 31 designated Mineral Resource Sectors. Since that time, at least five of the sectors had been deleted by the State, and seven sectors were still being opposed by the City for mineral resource designation (Figure 5.9-2).

5.9.2.2 Arrowhead Springs Specific Plan

The Arrowhead Springs planning area is located in the northeastern portion of the San Bernardino planning area. Generally, the Arrowhead Springs Specific Plan area has the same geological setting as the City of San Bernardino as they are interconnected. However, while the City lies mainly at the base of the steeper slopes of the San Bernardino Mountains, the Arrowhead Springs planning area extends up the flank of the San Bernardino Mountains. The Arrowhead Springs Specific Plan area lies at an elevation of 1,480 feet to 2,400 feet above mean sea level (msl). Arrowhead Springs is located in the Waterman Canyon and East Twin Creek Watersheds and three primary water courses flow through the planning area: the East Twin Creek; Strawberry Creek; and West Twin Creek which flows through Waterman Canyon. The Arrowhead Springs planning area can be described as hilly marked with sharp terrain, valleys, and inaccessible steep slopes of the San Bernardino Mountains. In general the Arrowhead Springs Specific Plan area consists of numerous canyons primarily facing south.

Within areas of the upper plateau and ridges, near the south, the subgrade soils are comprised of moderately dense, deeply weathered gravely sand with some silts. Within the upper plateau and hillsides near the north, subgrades are expected to consist of grayish brown to gray highly fractured metamorphic rocks, weathered gravelly sand of decomposed granitic origin, and/or calcite as derived from old hot springs. Within the canyon bottoms, subgrade soils consist of alluviums of silty fine sand and fine to medium coarse gravelly sand of variable consistency along with numerous cobbles and isolated rocks. Subgrade soils underlying the upper described alluviums are expected to consist of well consolidated gravelly sand or weathered bedrock of siltstone/sandstone origin, generally compressible in nature.

The sediments accumulated in the alluvial fans and floodplain deposits described above have been partially classified by the California Department of Conservation, Division of Mines and Geology. The Arrowhead Springs area is predominately outside the limit of aggregate classification and zoned as MRZ-4. However, the most southern portion of the area is within the limit of classification and zoned as MRZ-3. Figure 5.9-1 indicates that the MRZ-3 zone lacks adequate information for the Arrowhead Springs area. The primary goal of mineral resource classification was to identify regionally significant mineral deposits in an effort to conserve and develop them for anticipated aggregate production needs of the region. The Arrowhead Springs area does not have sufficient data available to make a determination of any significant mineral deposits.

According to Appendix G of the CEQA Guidelines, a project would normally have a significant effect on the environment if the project would:

M-1 Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state.

M-2 Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan.

The following impact analysis addresses thresholds of significance for which the Initial Study disclosed potentially significant impacts. The applicable thresholds are identified in parenthesis after the impact statement.

5.9.4.1 San Bernardino General Plan

GP IMPACT 5.9-1: PROJECT IMPLEMENTATION WOULD NOT RESULT IN THE LOSS OF AVAILABILITY OF A KNOWN MINERAL RESOURCE. [THRESHOLDS M-1 AND M-2]

Impact Analysis: As previously stated the City of San Bernardino further evaluated areas listed by the State as containing regionally significant construction aggregate sectors as shown on Figure 5.9-2 and determined several sectors could not be protected due to incompatible land use and such sectors were opposed by the City. The reasons these sectors are opposed by the City include; rapid growth rate (in excess of 25 percent), identification of rare and endangered plant species, traffic and safety concerns, proximity to highly urbanized areas, inadequate freeway access, and incompatibility with surrounding land uses (lack of a adequate buffer zone).

The aggregate sectors identified on Figure 5.9-2 (not including the contested areas) all fall within Public Flood Control or Industrial land use designations where mineral extraction is an allowed use and thus build-out of the General Plan as proposed does not represent a loss in availability of a known mineral resource.

Relevant General Plan Policies and Programs

The following are City of San Bernardino General Plan policies and programs related to mineral resources:

Natural Resources Element

Policy 12.4.1: Continue to document current extraction sites, including sand and gravel quarries, including the status and duration of existing permits and approvals.

Policy 12.4.2: Impose conditions and enforce mitigation measures on mining operations to reduce dust, noise, and safety hazards associated with removal of construction aggregate and minimize impacts on adjacent properties and environmental resources.

Policy 12.4.3: Determine and designate approved access routes to and from mineral resource sectors to minimize the impacts to vehicular circulation on City streets.

Policy 12.4.4: Require that any applications to permit uses other than mineral extraction or the interim uses defined in areas designated IE, Industrial Extractive include findings to be prepared by the project proponent outlining the reasons why mining is not a feasible use and how the deletion of the area as a potential mineral resource supply impacts the regional supply of aggregate resources.

Policy 12.4.5: Require that the operation and reclamation of surface mines be consistent with the State Surface Mining and Reclamation Act (SMARA) and the Development Code.

Policy 12.4.6: Designate post aggregate extraction reclamation procedures to mitigate potential environmental impacts and safety hazards. Long-term monitoring of the effectiveness of the reclamation procedures should be considered as an integral part of the program.

Policy 12.4.7: Restrict incompatible land uses within the impact area of existing or potential surface mining areas.

Policy 12.4.8: Require that new, non-mining land uses adjacent to existing mining operations be designed to provide a buffer between the new development and the mining operations. The buffer distance shall be based on an evaluation of noise, aesthetics, drainage, operating conditions, biological resources, topography, lighting, traffic, operating hours, and air quality.

5.9.4.2 Arrowhead Springs Specific Plan

AHS IMPACT 5.9-1: PROJECT IMPLEMENTATION WOULD NOT RESULT IN THE LOSS OF AVAILABILITY OF A KNOWN MINERAL RESOURCE. [THRESHOLDS M-1 AND M-2]

Impact Analysis: The Arrowhead Springs area is predominately outside the limit of aggregate classification and zoned as MRZ-4. However, the most southern portion of the area is within the limit of classification and zoned as MRZ-3. The area of Arrowhead Springs is not considered likely to contain significant sources of mineral resources. Furthermore due to its mountainous terrain and limited access roads pockets of aggregates which may be in the low lying stream bed areas are not likely to be economically viable. Additionally the MWD pipeline would preclude mining in areas where it is located. There are currently no aggregate mining activities in the area. At this time there is no evidence of economically viable mineral resources within the area and development pursuant to the Specific Plan is not anticipated to result in loss of significant resources. However, the future economic feasibility of mining any of the MRZ-3 or MRZ-4 resources would depend on future market conditions and the resource availability within the production-consumption area.

- The intent of SMARA is to promote production and conservation of mineral resources, minimize environmental effects of mining and to ensure that mined lands will be reclaimed to conditions suitable for alternative uses. The act mandates a two-phased mineral resources process called classification-designation. The California Division of Mines and Geology is responsible for the classification phase of the process and the State Mining and Geology Board is responsible for designating areas of significance that are known to contain significant mineral deposits. This objective of providing the information is to provide a basis for local land use decision makers in which the availability of the mineral resource is acknowledged.

- California aggregate companies are heavily regulated and must meet the requirements of up to 80 agencies overseeing federal, state, county, and local laws. Regulations cover environmental, technical, health and safety, aesthetic, cultural, land use, and reclamation standards. Obtaining an operating permit is both intensive and extensive, involving in-depth studies and thorough data compilation. Consulting with communities, regulatory agencies, government officials, and all other interested or affected stakeholders is an equally important procedure. The permitting process often takes from 2-10 years to complete, includes substantial up-front investment by the company, and offers no guarantee of project approval. Once the permit is granted, the regulatory process continues throughout the life of the operation with continued submission of data, and inspections.

Upon implementation of project design features, regulatory requirements, and standard conditions of approval, the following impacts would be less than significant:

GP Impact 5.9-1 The aggregate sectors identified by the State fall within use designations where mineral extraction is an allowed use; thus build-out of the General Plan as proposed does not represent a loss in availability of a known mineral resource.

AHS Impact 5.9-1 Although not specifically identified by the State, the Arrowhead Springs Specific Plan area is not likely to yield economically significant aggregate sectors due to mountainous terrain and preexisting uses.

5.9.7.1 San Bernardino General Plan

No significant impacts were identified and no mitigation measures are necessary.

5.9.7.2 Arrowhead Springs Specific Plan

No significant impacts were identified and no mitigation measures are necessary.

No significant adverse impacts relating to mineral resources were identified and no mitigation measures are necessary.

5.10 NOISE

5.10.1 Environmental Setting

Characteristics of Sound

Sound is a pressure wave transmitted through the air. It is described in terms of loudness or amplitude (measured in decibels), frequency or pitch (measured in Hertz [Hz] or cycles per second), and duration (measured in seconds or minutes). The standard unit of measurement of the loudness of sound is the decibel (dB). Changes of 1 to 3 dBA are detectable under quiet, controlled conditions and changes of less than 1 dBA are usually indiscernible. A change of 5 dBA is readily discernable to most people in an exterior environment whereas a 10 dBA change is perceived as a doubling (or halving) of the sound.

The human ear is not equally sensitive to all frequencies. Sound waves below 16 Hz are not heard at all and are "felt" more as a vibration. Similarly, while people with extremely sensitive hearing can hear sounds as high as 20,000 Hz, most people cannot hear above 15,000 Hz. In all cases, hearing acuity falls off rapidly above about 10,000 Hz and below about 200 Hz. Since the human ear is not equally sensitive to sound at all frequencies, a special frequency dependent rating scale is usually used to relate noise to human sensitivity. The A-weighted decibel scale (dBA) performs this compensation by discriminating against frequencies in a manner approximating the sensitivity of the human ear.

Noise is defined as unwanted sound, and is known to have several adverse effects on people, including hearing loss, speech and sleep interference, physiological responses, and annoyance. Based on these known adverse effects of noise, the Federal government, the State of California, and many local governments have established criteria to protect public health and safety and to prevent disruption of certain human activities.

Measurement of Sound

Sound intensity is measured through the A-weighted measure to correct for the relative frequency response of the human ear. That is, an A-weighted noise level de-emphasizes low and very high frequencies of sound similar to the human ear's de-emphasis of these frequencies.

Unlike linear units such as inches or pounds, decibels are measured on a logarithmic scale, representing points on a sharply rising curve. On a logarithmic scale, an increase of 10 dB is 10 times more intense than 1 dB, while 20 dB is 100 times more intense, and 30 dB is 1,000 times more intense. A sound as soft as human breathing is about 10 times greater than 0 dB. The decibel system of measuring sound gives a rough connection between the physical intensity of sound and its perceived loudness to the human ear. Ambient sounds generally range from 30 dBA (very quiet) to 100 dBA (very loud).

Sound levels are generated from a source and their decibel level decreases as the distance from that source increases. Sound dissipates exponentially with distance from the noise source. This phenomenon is known as “spreading loss.” For a single point source, sound levels decrease by approximately 6 dB for each doubling of distance from the source. This drop-off rate is appropriate for noise generated by on-site operations from stationary equipment or activity at a project site. If noise is produced by a line source, such as highway traffic, the sound decreases by 3 dB for each doubling of distance in a hard site environment. Line source noise in a relatively flat environment with absorptive vegetation decreases by 4.5 dB for each doubling of distance. This latter value is also used in the calculation of railroad noise.

Time variation in noise exposure is typically expressed in terms of a steady-state energy level equal to the energy content of the time varying period (called L_{eq}), or alternately, as a statistical description of the sound level that is exceeded over some fraction of a given observation period. For example, the L_{50} noise level represents the noise level that is exceeded 50 percent of the time. Half the time the noise level exceeds this

level and half the time the noise level is less than this level. This level is also representative of the level that is exceeded 30 minutes in an hour. Similarly, the L_{02}, L_{08} and L_{25} values represent the noise levels that are exceeded 2, 8, and 25 percent of the time or 1, 5, and 15 minutes per hour. These "L" values are typically used to demonstrate compliance for stationary noise sources with a city's noise ordinance, as discussed below. Other values typically noted during a noise survey are the L_{min} and L_{max}. These values represent the minimum and maximum root-mean-square noise levels obtained over the measurement period.

Because community receptors are more sensitive to unwanted noise intrusion during the evening and at night, State law and the City of San Bernardino require that, for planning purposes, an artificial dB increment be added to quiet time noise levels in a 24-hour noise descriptor called the Community Noise Equivalent Level (CNEL) or Day-Night Noise Level (Ldn). The CNEL descriptor requires that an artificial increment of 5 dBA be added to the actual noise level for the hours from 7:00 p.m. to 10:00 p.m. and 10 dBA for the hours from 10:00 p.m. to 7:00 a.m. The Ldn descriptor uses the same methodology except that there is no artificial increment added to the hours between 7:00 p.m. and 10:00 p.m. Both descriptors give roughly the same 24-hour level with the CNEL being only slightly more restrictive (i.e., higher).

Psychological and Physiological Effects of Noise

Physical damage to human hearing begins at prolonged exposure to noise levels higher than 85 dBA. Exposure to high noise levels affects our entire system, with prolonged noise exposure in excess of 75 dBA increasing body tensions, and thereby affecting blood pressure, functions of the heart and the nervous system. In comparison, extended periods of noise exposure above 90 dBA could result in permanent cell damage. When the noise level reaches 120 dBA, a tickling sensation occurs in the human ear even with short-term exposure. This level of noise is called the threshold of feeling. As the sound reaches 140 dBA, the tickling sensation is replaced by the feeling of pain in the ear. This is called the threshold of pain. A sound level of 190 dBA will rupture the eardrum and permanently damage the inner ear.

Vibration Fundamentals

Vibration is a trembling, quivering, or oscillating motion of the earth. Like noise, vibration is transmitted in waves, but in this case through the earth or solid objects. Unlike noise, vibration is typically of a frequency that is felt rather than heard.

Vibration can be either natural as in the form of earthquakes, volcanic eruptions, sea waves, landslides, or man-made as from explosions, the action of heavy machinery or heavy vehicles such as trains. Both natural and man-made vibration may be continuous such as from operating machinery, or transient as from an explosion.

As with noise, vibration can be described by both its amplitude and frequency. Amplitude may be characterized in three ways including displacement, velocity and acceleration. Particle displacement is a measure of the distance that a vibrated particle travels from its original position and for the purposes of soil displacement is typically measured in inches or millimeters. Particle velocity is the rate of speed at which soil particles move in inches per second or millimeters per second. Particle acceleration is the rate of change in velocity with respect to time and is measured in inches per second or millimeters per second. Typically, particle velocity (measured in inches or millimeters per second) and/or acceleration (measured in gravities) are used to describe vibration. Table 5.10-1 presents the human reaction to various levels of peak particle velocity.

Vibrations also vary in frequency and this affects perception. Typical construction vibrations fall in the 10 to 30 Hz range and usually occur around 15 Hz. Traffic vibrations exhibit a similar range of frequencies; however, due to their suspension systems, buses often generate frequencies around 3 Hz at high vehicle speeds. It is more uncommon, but possible, to measure traffic frequencies above 30 Hz.

Table 5.10-1
Human Reaction to Typical Vibration Levels

Vibration Level Peak Particle Velocity (in/sec)	Human Reaction	Effect on Buildings
0.006 – 0.019	Threshold of perception, possibility of intrusion	Vibrations unlikely to cause damage of any type
0.08	Vibrations readily perceptible	Recommended upper level of vibration to which ruins and ancient monuments should be subjected
0.10	Level at which continuous vibration begins to annoy people	Virtually no risk of "architectural" (i.e., not structural) damage to normal buildings
0.20	Vibrations annoying to people in buildings	Threshold at which there is a risk to "architectural" damage to normal dwelling – houses with plastered walls and ceilings
0.4 – 0.6	Vibrations considered unpleasant by people subjected to continuous vibrations and unacceptable to some people walking on bridges	Vibrations at a greater level than normally expected from traffic, but would cause "architectural" damage and possibly minor structural damage

Source: Caltrans 2002.

The way in which vibration is transmitted through the earth is called propagation. Propagation of earthborn vibrations is complicated and difficult to predict because of the endless variations in the soil through which waves travel. There are three main types of vibration propagation: surface, compression and shear waves. Surface waves, or Raleigh waves, travel along the ground's surface. These waves carry most of their energy along an expanding circular wave front, similar to ripples produced by throwing a rock into a pool of water. P-waves, or compression waves, are body waves that carry their energy along an expanding spherical wave front. The particle motion in these waves is longitudinal (i.e., in a "push-pull" fashion). P-waves are analogous to airborne sound waves. S-waves, or shear waves, are also body waves that carry energy along an expanding spherical wave front. However, unlike P-waves, the particle motion is transverse or "side-to-side and perpendicular to the direction of propagation."

As vibration waves propagate from a source, the energy is spread over an ever-increasing area such that the energy level striking a given point is reduced with the distance from the energy source. This geometric spreading loss is inversely proportional to the square of the distance. Wave energy is also reduced with distance as a result of material damping in the form of internal friction, soil layering, and void spaces. The amount of attenuation provided by material damping varies with soil type and condition as well as the frequency of the wave.

Regulatory Framework

To limit population exposure to physically and/or psychologically damaging, as well as intrusive noise levels, the Federal government, the State of California, various County governments, and most municipalities in the State have established standards and ordinances to control noise.

Federal Regulations

Federal Highway Administration

Interstate 215, Interstate 210, Interstate 10, State Route (SR) 30, SR-330, and SR-18 traverse the City of San Bernardino. These routes are subject to Federal funding and as such are under the purview of the Federal Highway Administration (FHWA). The FHWA has developed noise standards that are typically used for

federally funded roadway projects or projects that require either Federal or Caltrans review. These noise standards are based on L_{eq} and L_{10} values.

The FHWA values are the maximum desirable values by land use type and area based on a "trade-off" of what is desirable and what is reasonably feasible. These values recognize that in many cases lower noise exposures would result in greater community benefits. The FHWA design noise levels are included in Table 5.10 2.

Table 5.10-2
FHWA Design Noise Levels

Activity Category	Design Noise Levels [1]		Description of Activity Category
	L_{eq} (dBA)	L_{10} (dBA)	
A	57 (exterior)	60 (exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67 (exterior)	70 (exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	72 (exterior)	75 (exterior)	Developed lands, properties, or activities not included in Categories A or B, above
D	–	–	Undeveloped lands.
E	52 (interior)	55 (interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

[1] Either L_{eq} or L_{10} (but not both) design noise levels may be used on a project.
Source: FHWA

U.S. Environmental Protection Agency

In addition to FHWA standards, the United States Environmental Protection Agency (EPA) has identified the relationship between noise levels and human response. The EPA has determined that over a 24-hour period, a Leq of 70 dBA will result in some hearing loss. Interference with activity and annoyance will not occur if exterior levels are maintained at a L_{eq} of 55 dBA and interior levels at or below 45 dBA. While these levels are relevant for planning and design and useful for informational purposes, they are not land use planning criteria because they do not consider economic cost, technical feasibility, or the needs of the community.

The EPA also set 55 dBA Ldn as the basic goal for exterior residential noise intrusion. However, other Federal agencies, in consideration of their own program requirements and goals, as well as difficulty of actually achieving a goal of 55 dBA Ldn, have settled on the 65 dBA Ldn level as their standard. At 65 dBA Ldn, activity interference is kept to a minimum, and annoyance levels are still low. It is also a level that can realistically be achieved.

Occupational Health and Safety Administration

The Federal government regulates occupational noise exposure common in the workplace through the Occupational Health and Safety Administration (OSHA) under the EPA. Such limitations would apply to the operation of construction equipment and could also apply to any proposed industrial land uses. Noise exposure of this type is dependent on work conditions and is addressed through a facility's Health and Safety Plan, as required under OSHA, and is therefore not addressed further in this analysis.

U.S. Department of Housing and Urban Development

The US Department of Housing and Urban Development (HUD) has set a goal of 65 dBA Ldn as a desirable maximum exterior standard for residential units developed under HUD funding. (This level is also generally accepted within the State of California.). While HUD does not specify acceptable interior noise levels, standard construction of residential dwellings constructed under Title 24 standards typically provides in excess of 20 dBA of attenuation with the windows closed. Based on this premise, the interior Ldn should not exceed 45 dBA.

Railroad Noise Standards

The Burlington Northern Santa Fe (BNSF), Union Pacific, and Metrolink railroads also transverse the City of San Bernardino. The Federal government regulates railroad operations in the United States. Train noise is preempted from direct local control by the Federal Noise Control Act (Public Law 90-411, as amended). Federal regulations do not specify absolute levels of acceptable noise that apply directly to rail noise and compatible land uses along rail lines. The following summarizes the applicable Federal rail noise assessment criteria and guidelines.

The EPA is charged with regulating railroad noise under the Noise Control Act. These regulations appear in the Code of Federal Regulations, Title 40, Chapter 1, Part 201. While these regulations remain in force, the EPA Office of Noise Abatement and Control was closed in 1982, leaving enforcement of the EPA regulations to the Federal Railroad Administration (FRA). Representatives of the EPA, however, have indicated that states and localities may, at their option, enforce the Federal regulation.

Table 5.10-3 summarizes the EPA railroad noise standards that set operating noise standards for railroad equipment and set noise limit standards for new equipment. (Note that these values are in terms of the L_{max} [i.e., greatest root-mean-square value obtained over a measurement period], and can be considerably greater than the L_{eq} [i.e., time-weighted equivalent sound level] typically used in the measurement of obtrusive noise.])

Table 5.10-3
Summary of EPA/FRA Railroad Noise Standards

Noise Sources	Operating Conditions	Noise Metric	Measured Distance (feet)	Standard (dBA)
Non-Switcher Locomotives built on or before 12/31/79	Stationary	L_{max} (Slow) [1]	100	73
	Idle Stationary	L_{max} (Slow)	100	93
	Non-Idle Moving	L_{max} (Fast) [2]	100	95
Switcher Locomotives plus Non-Switcher Locomotives built after 12/31/79	Stationary	L_{max} (Slow)	100	70
	Idle Stationary	L_{max} (Slow)	100	87
	Non-Idle Moving	L_{max} (Fast)	100	90
Rail Cars	Speed < 45 mph	L_{max} (Fast)	100	88
	Speed > 45 mph	L_{max} (Fast)	100	93
	Coupling	Adj. Avg. Max.	50	92

[1] A slow exponential-time-weighting is used.
[2] A fast exponential-time-weighting is used.
Source: United States Environmental Protection Agency Railroad Noise Emission Standard (40 CFR Part 201)

The Federal Rail Administration adopted the EPA railroad noise standards as its noise regulations (CFR 49, Chapter 11, part 210) for the purpose of enforcement. The standards provide specific noise limits for stationary and moving locomotives, moving railroad cars and associated railroad operations in terms of A-weighted sound level at a specified measurement location. These regulations are pre-emptive, and states

and local governments cannot set more stringent limits for railroad equipment than required by these Federal regulations.

Aircraft Noise Standards

The San Bernardino International Airport is located within the City of San Bernardino. The San Bernardino International Airport was formerly known as the Norton Air Force Base until its closure in 1994. The Airport is currently owned and operated by the San Bernardino International Airport Authority (SBIAA), a regional Joint Powers Authority formed in 1990 and 1992 respectively. The SBIAA includes the City of San Bernardino, the County of San Bernardino, Highland, Loma Linda, and Colton. The non-airport portions of former Norton Air Force Base is under the jurisdiction of the Inland Valley Development Agency, a Joint Powers Authority that includes the City of San Bernardino, the County of San Bernardino, Loma Linda, and Colton. The San Bernardino Airport is an FAA Part 139 commercial airport, rated for Stage 2 aircraft. Stage 2 aircraft meet the noise levels prescribed by Federal Aviation regulations (FAR) Part 36 and are less stringent than those established for the quieter designation (Stage 3). Its infrastructure is supported with a 10,000-foot runway, a new state-of-the-art Instrument Landing System and an Automated Weather Observation System III. The SBIAA is currently in the process of preparing an Airport Master Plan and Airport Land Use Compatibility Plan for the San Bernardino International Airport. Section 21676 of the Public Utilities Code requires that cities revise general plans and specific plans to be consistent with the airport land use plan.

The FAA Advisory Circular Number 150 5020 2, entitled "Noise Assessment Guidelines for New Helicopters recommends the use of a cumulative noise measure, the 24-hour equivalent sound level ($L_{eq}(24)$), so that the relative contributions of the heliport and other sound sources within the community may be compared. The $L_{eq}(24)$ is similar to the Ldn used in assessing the impacts of fixed wing aircraft. The helicopter $L_{eq}(24)$ values are obtained by logarithmically adding the single-event SEL values over a 24-hour period.

Public Law 96 193 also directs the FAA to identify land uses which are "normally compatible" with various levels of noise from aircraft operations. Because of the size and complexity of many major hub airports and their operations, FAR Part 150 identifies a large number of land uses and their attendant noise levels. However, since the operations of most heliports and helistops tend to be much simpler and the impacts more restricted in area, Part 150 does not apply to heliports/helistops not located on airport property. Instead, the FAA recommends exterior noise criteria for individual heliports based on the types of surrounding land uses. These recommended noise levels are included in Table 5.10 4.

The maximum recommended cumulative sound level ($L_{eq}(24)$) from the operations of helicopters at any new site should not exceed the ambient noise already present in the community at the site of the proposed heliport or the sound levels in Table 5.10 4, whichever is lower.

Table 5.10-4
Normally Compatible Community Sound Levels

Type of Area	$L_{eq}(24)$
Residential	
Suburban	57
Urban	67
City	72
Commercial	72
Industrial	77

Source: FAA Advisory Circular Number 150-5020-2, 1983

California State Regulations

The California Department of Health Services' (DHS) Office of Noise Control has studied the correlation of noise levels and their effects on various land uses. The State of California Interior and Exterior Noise Standards are shown in Table 5.10-5.

Table 5.10-5
State of California Interior and Exterior Noise Standards

Land Use		CNEL (dBA)	
Categories	**Uses**	**Interior[1]**	**Exterior[2]**
Residential	Single and multi-family, duplex	45[3]	65
	Mobile homes	–	65[4]
Commercial	Hotel, motel, transient housing	45	–
	Commercial retail, bank, restaurant	55	–
	Office building, research and development, professional offices	50	–
	Amphitheater, concert hall, auditorium, movie theater	45	–
	Gymnasium (Multi-purpose)	50	–
	Sports Club	55	–
	Manufacturing, warehouse, wholesale, utilities	65	–
	Movie Theaters	45	–
Institutional/ Public	Hospital, school classrooms/playground	45	65
	Church, library	45	–
Open Space	Parks	–	65

[1] Indoor environment excluding: bathrooms, kitchens, toilets, closets, and corridors
[2] Outdoor environment limited to:
• Private yard of single-family dwellings • Multi-family private patios or balconies accessed from within the dwelling (Balconies 6 feet deep or less are exempt) • Mobile home parks • Park picnic areas • School playgrounds • Hospital patios
[3] Noise level requirement with closed windows, mechanical ventilation or other means of natural ventilation shall be provided as per Chapter 12, Section 1205 of the Uniform Building Code.
[4] Exterior noise levels should be such that interior noise levels will not exceed 45 dBA CNEL.

Table 5.10-6, presents a land use compatibility chart for community noise prepared by the California Office of Noise Control. This Table provides urban planners with a tool to gauge the compatibility of land uses relative to existing and future noise levels.

Table 5.10-6
Community Noise and Land Use Compatibility

Land Uses	CNEL (dBA)						
	50	55	60	65	70	75	80
Residential-Low Density Single Family, Duplex, Mobile Homes							
Residential- Multiple Family							
Transient Lodging: Hotels and Motels							
Schools, Libraries, Churches, Hospitals, Nursing Homes							
Auditoriums, Concert Halls, Amphitheaters							
Sports Arena, Outdoor Spectator Sports							
Playground, Neighborhood Parks							
Golf Courses, Riding Stables, Water Recreation, Cemeteries							
Office Buildings, Businesses, Commercial and Professional							
Industrial, Manufacturing, Utilities, Agricultural							

Explanatory Notes

Normally Acceptable:
With no special noise reduction requirements assuming standard construction.

Generally Unacceptable:
New construction is discouraged. If new construction does not proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.

Conditionally Acceptable:
New construction or development should be undertaken only after a detailed analysis of the noise reduction requirement is made and needed noise insulation features included in the design.

Land Use Discouraged:
New construction or development should generally not be undertaken.

Source: Federal Highway Program Manual Vol. 7, Ch. 7, Sec. 3, 1982

Table 5.10-5 identifies normally acceptable, conditionally acceptable and clearly unacceptable noise levels for various land uses. A conditionally acceptable designation implies new construction or development should be undertaken only after a detailed analysis of the noise reduction requirements for each land use is made and needed noise insulation features are incorporated in the design. By comparison, a normally acceptable designation indicates that standard construction can occur with no special noise reduction requirements.

City of San Bernardino Noise Standards

The General Plan is subject to the Noise Ordinance incorporated therein. The City of San Bernardino Noise Ordinance (Section 19.20.030.15 of the Development Code) specifies the maximum acceptable levels of noise for residential uses in the City. According to the Noise Ordinance, in residential areas, no exterior noise level shall exceed 65dBA and no interior noise level shall exceed 45dBA.

Noise from the operation of construction equipment is governed under the local Municipal Code, Section 8.54. Section 8.44.020 of the City of San Bernardino Municipal Code prohibits the operation or use between the hours of ten p.m. and seven a.m. of any pile driver, steam shovel, pneumatic hammers, derrick, steam or electric hoist, power driven saw, or any other tool or apparatus, the use of which is attended by loud and excessive noise, except with the approval of the Mayor and Common Council.

5.10.1.1 San Bernardino General Plan

Like all highly urbanized areas, the City of San Bernardino is subject to noise from a myriad of sources. The major source of noise is from mobile sources and most specifically, traffic traveling through the City on its various roadways and freeways. Aircraft over flights from the San Bernardino International Airport also contribute to this noise. The southeastern portion of the City is located directly within the flight path of aircraft approaching and departing the San Bernardino International Airport. Noise generated by aircraft generates substantial noise within the area surrounding the airport. Noise generated by trains on the BNSF, Union Pacific and Metrolink railroads also generates noise within the City. Freight and commuter rail-traffic pass through the City and noise generated along these rail lines can be substantially higher than in areas that are located away from the tracks. Noise from trains and their associated horns and whistles are a particular concern to those residents that live along these railroad corridors.

The City also includes a variety of stationary noise sources. These are primarily associated with existing industrial land uses.

On-Road Vehicles

Noise from motor vehicles is generated by engine vibrations, the interaction between tires and the road, and the exhaust system. Reducing the average motor vehicle speed reduces the noise exposure of receptors adjacent to the road. Each reduction of five miles per hour reduces noise by about 1.3 dBA.

In order to assess the potential for mobile-source noise impacts, it is necessary to determine the noise currently generated by vehicles traveling through the project area. Average daily traffic (ADT) volumes were based on the existing daily traffic volumes provided by Transtech Engineers. The results of this modeling indicate that average noise levels along arterial segments currently range from approximately 61 dBA to about 77 dBA CNEL as calculated at a distance of 50 feet from the centerline of the road. Freeways and interstate routes would have noise levels that range from 74 dBA to 87 dBA CNEL at the edge of the roadway. Noise levels for existing conditions along analyzed roadways are presented in Table 5.10-7.

Table 5.10-7
Existing Traffic Noise Levels
(dBA CNEL)

Segment	Existing Year 2005				
	ADT Volumes	CNEL (dBA @ 50 Feet)	Distance to CNEL Contour (Feet from Centerline)		
			60 (dBA CNEL)	65 (dBA CNEL)	70 (dBA CNEL)
4th Street					
I-215 – Arrowhead	1,208	61	58	27	12
5th Street					
Pepper – I-215	24,250	76	560	260	121
I-215 – Waterman	28,290	76	621	288	134
Waterman – Victoria	11,200	72	335	155	72
Victoria – Palm	1,965	65	105	49	23
9th Street					
Medical Center – I-215	4,495	67	138	64	30
I-215 – Waterman	6,018	68	168	78	36
Waterman – Tippecanoe	4,539	67	139	65	30
Tippecanoe – Del Rosa	4,745	67	143	67	31
40th Street					
Valencia – Waterman	8,910	71	251	117	54
Waterman – Sierra	18,879	72	310	144	67
Sierra – Mountain View	15,810	71	275	128	59
Baseline Street					
SR-30 – Palm	6,940	69	185	86	40
Palm – Valencia	14,670	72	304	141	66
Valencia – I-215	24,141	77	634	294	137
I-215 – Riverside	18,680	74	412	191	89
Highland Avenue					
Riverside – I-215	26,028	73	383	178	83
I-215 – Victoria	15,150	71	267	124	58
Victoria – SR-30	18,930	72	310	144	67
SR-30 – E. City Limit	12,970	72	323	150	70
Hospitality Lane					
E Street – Hunts	25,820	73	381	177	82
Hunts – Waterman	25,750	73	381	177	82
Mill Street					
Tippecanoe – Waterman	13,040	71	281	131	61
Waterman – Mt. Vernon	16,179	71	279	130	60
Mt. Vernon – Bordwell	15,680	71	273	127	59
Redlands Boulevard					
I-215 – Waterman	14,554	72	303	141	65
Rialto Avenue					
Riverside – Rancho	12,250	70	232	108	50
Rancho – I Street	10,050	69	203	94	44
I Street – Sierra	8,410	68	181	84	39
Sierra – Tippecanoe	2,920	64	89	41	19
Boulder Avenue					
Atlantic -Pacific	10,910	72	329	153	71

Table 5.10-7
Existing Traffic Noise Levels
(dBA CNEL)

Segment	Existing Year 2005				
	ADT Volumes	CNEL (dBA @ 50 Feet)	Distance to CNEL Contour (Feet from Centerline)		
			60 (dBA CNEL)	65 (dBA CNEL)	70 (dBA CNEL)
Del Rosa Drive					
3rd Street – Paloma	6,040	67	145	67	31
Baseline – SR-30	8,110	68	176	82	38
SR-30 – Quail Canyon	4,070	66	129	60	28
E Street					
I-10 – Fairway	18,134	73	351	163	76
Fairway – 9th Street	8,770	70	216	100	47
9th St – Kendall	17,740	73	345	160	74
Palm Avenue					
Pacific – Highland	9,940	71	271	126	58
Pepper Avenue					
I-10 – Foothill	16,420	73	378	175	81
Rancho Avenue					
I-10 – Mill	10,566	70	245	113	53
Mill – Rialto	10,566	70	245	113	53
Rialto – Foothill	5,770	68	163	76	35
Sierra Way					
Waterman – 40th Street	9,000	70	220	102	47
40th Street – 5th Street	7,000	68	160	74	34
5th Street – 2nd Street	9,336	69	194	90	42
2nd Street – Mill	3,385	64	98	46	21
Victoria Avenue					
Lynwood – Baseline	7,720	69	198	92	43
Baseline – 3rd Street	6,380	68	175	81	38
Waterman Avenue					
I-10 – Highland	22,144	74	400	186	86
Highland – Sierra	18,480	75	468	217	101
Freeways					
Interstate 10					
Jct. I-215 to Waterman Ave	182,350	86	2752	1278	593
Waterman Ave to Tippecanoe Ave	149,470	85	2411	1119	519
Tippecanoe Ave to Mountain View	148,420	85	2399	1114	517
Interstate 215					
Jct. I-10 to Orange Show Rd	144,220	85	2354	1093	507
Orange Show Rd to Inland Center Drive	135,780	85	2261	1050	487
Jct. Route 66 to Baseline St	113,690	84	2009	932	433
Jct. Route 30 to University Parkway	55,790	81	1250	580	269
State Route 259					
Junction Route 30	67,000	82	1,412	655	304
E Street	67,000	82	1,412	655	304
End Route 259	55,000	81	1,238	575	267

Table 5.10-7
Existing Traffic Noise Levels
(dBA CNEL)

Segment	Existing Year 2005				
	ADT Volumes	CNEL (dBA @ 50 Feet)	Distance to CNEL Contour (Feet from Centerline)		
			60 (dBA CNEL)	65 (dBA CNEL)	70 (dBA CNEL)
State Route 30					
Highland Ave to Jct. I-215	15,260	75	527	244	113
Jct. I-215 to H Street	31,580	78	855	397	184
H Street to Route 259	32,630	79	874	406	188
Route 259 to Waterman Ave	66,670	82	1407	653	303
Waterman Ave to Del Rosa Drive	66,670	82	1407	653	303
State Route 330					
Junction Route 30	11,500	74	436	202	94
Running Springs Junction Route 18	12,400	74	459	213	99

Aircraft Noise

The San Bernardino International Airport is located in the southeastern portion of the City of San Bernardino. Airport noise generated from large aircraft contributes to the noise environment within the City. Noise from aircraft is produced from takeoff, flyovers/over flights, and approach/landings. Each of these events results in noise exposure to populations living in close proximity to the airport. Since the SBIAA is in the process of preparing the Airport Master Plan and the Comprehensive Land Use Plan (CLUP), the precise noise contours were not available to include in the General Plan Update. Upon adoption of the Airport Master Plan and CLUP, the new noise contours shall be incorporated into Figure LU-4 of the City of San Bernardino General Plan, in accordance with Section 21676 of the Public Utilities Code.

In addition to aircraft noise from the San Bernardino International Airport, local helicopter air traffic is commonplace throughout the City. News and other helicopters (e.g., freeway traffic report helicopters) fly through the area. Helicopter use for fire and police and at hospitals is considered as an emergency activity and is addressed by FAA regulations. The noise exposure generated by helicopter activity varies dependant on flight path which is determined by wind direction. There are currently five heliports in San Bernardino (National Orange Show, Red Dog Properties (private), San Bernardino Community Hospital, SCE Eastern Division, and in the Tri-City area).

Railroad Noise

The project area includes the presence of the freight and passenger trains along the Union Pacific railroad (UPRR), Burlington Northern Santa Fe (BNSFRR) railroads and Metrolink railroads. The UPRR is rail line is located along the 10 Freeway from Los Angeles till it reaches Colton from which it splits into the Palmdale line which turns northward through the western portion of the City of San Bernardino and the Yuma line which continues eastward. This rail line is utilized by both commuter (Metrolink) and freight trains. The total number of trains along the UPRR is variable on any given day due freight train usage. The BNSFRR heads east and southward from Los Angeles through Los Angeles and Riverside County where it heads northward through the City of San Bernardino. The portion of the BNSF line that crosses through the City of San Bernardino and heads north is called the Cajon Line. The San Bernardino Metrolink Line extends from San Bernardino to Los Angeles Union Station. The Inland Empire Orange County (IEOC) Metrolink Line extends from San Bernardino to San Juan Capistrano.

The number of freight trains using the UPRR and BNSF is dependant on the quantities and scheduling of freight at the sea ports. The Southern California Association of Governments (SCAG) has published "The Los Angeles-Inland Empire Railroad Main Line Advanced Planning Study" which provides estimates of train volumes for the year 2000. Table 5.10-8 presents the past and projected train volumes.

Table 5.10-8
Daily Train Volume Estimates

	Year 2000
Union Pacific Yuma Line	44
Union Pacific Palmdale Line	6.5
Burlington Northern Santa Fe Cajon Line	96
San Bernardino Metrolink Line	30
Inland Empire Orange County (IEOC) Metrolink Line	11

Source: Los Angeles-Inland Empire Railroad Main Line Advanced Planning Study. Southern California Association of Governments

Railroad noise is dependant on numerous factors including the number of engines and railcars, the average speed, the percentage of operations that take place at night, the type of rails and the presence of "at-grade" crossings that require the engineer to sound a warning horn. An at-grade crossing raises the noise produced by train activity substantially due to the sounding of the horn at 103 dBA as measured at 100 feet. Trains are required to sound their horns beginning at 1,300 feet from an at-grade crossing. The use of railroad warning signals is regulated at the Federal Railroad Administration and the City does not have authority to dictate railroad policy in this matter.

Noise from these operations was modeled using the horn model distributed by the Federal Railroad Administration. Modeling predicts that the 65 dBA Ldn noise contour falls at varying distances as shown in Table 5.10-9. These noise levels occur from 1,300 feet from the at-grade crossing. Noise levels with just the noise generated by the train without the horn would result in lower noise levels as shown in Table 5.10-9.

Table 5.10-9
Train Noise Estimates
(Distance in feet to 65 dBA Ldn Contour)

Line / Condition	Year 2000
Union Pacific Yuma Line	
With Horn Sounding	859
Without Horn Sounding	618
Union Pacific Palmdale Line	
With Horn Sounding	408
Without Horn Sounding	279
Burlington Northern Santa Fe Cajon Line	
With Horn Sounding	1,135
Without Horn Sounding	829
San Bernardino Metrolink Line	
With Horn Sounding	745
Without Horn Sounding	532
Inland Empire Orange County Metrolink Line	
With Horn Sounding	505
Without Horn Sounding	352

Based on the Federal Highway Administration (FHWA) Horn Model.

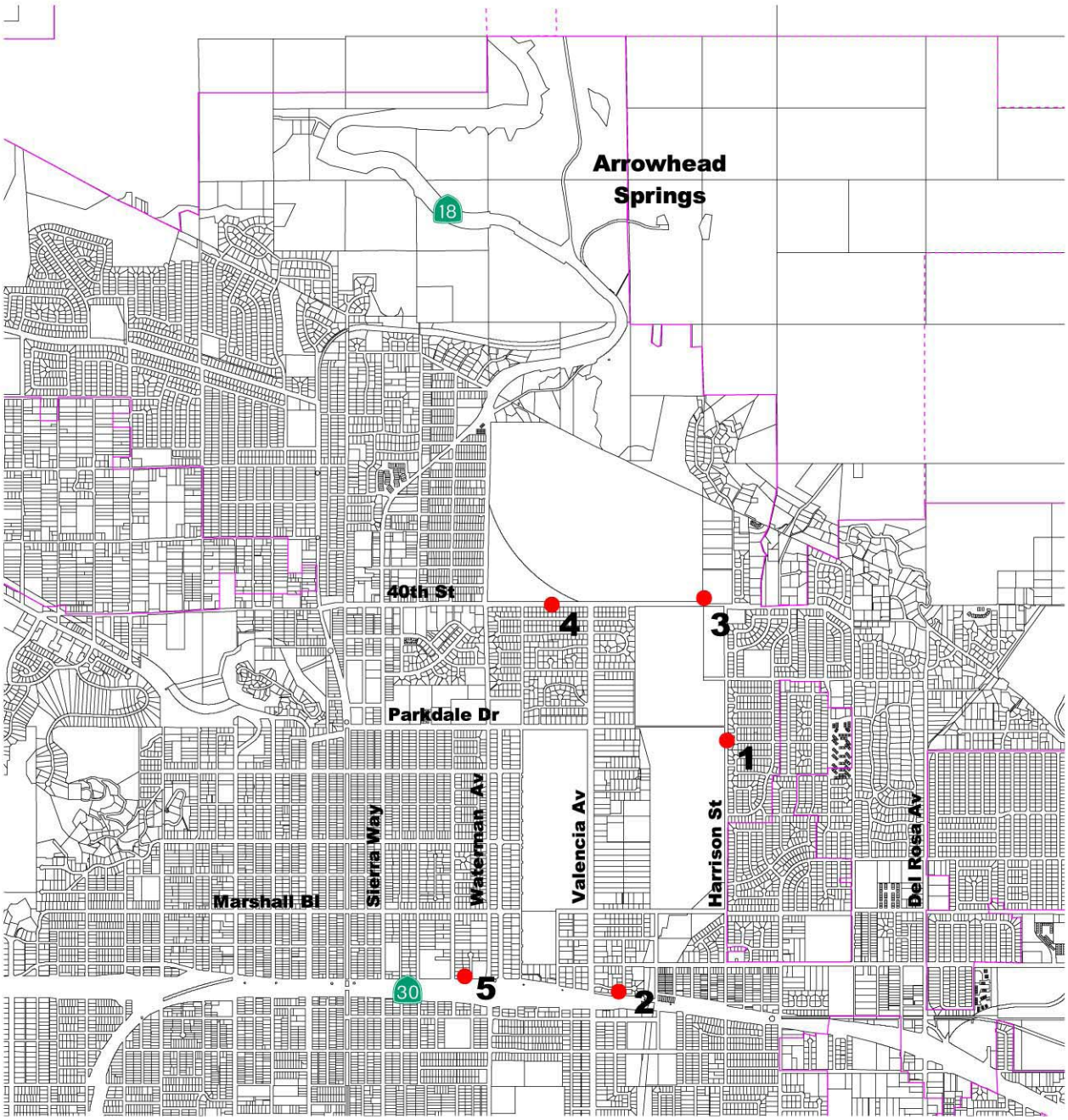
5.10.1.2 Arrowhead Springs Specific Plan

The Arrowhead Springs Planning area encompasses approximately 1,916 acres in a remote area within the San Bernardino Mountains. A portion of the project site is currently developed with the Arrowhead Springs Resort operated by Campus Crusade for Christ, International. The resort currently consists of approximately 34 buildings including a hotel, an auditorium, a chapel, dormitories, a pool and cabanas, residential bungalows, office buildings, and maintenance buildings. However, only the office, maintenance, and select bungalow buildings are currently utilized. The existing Arrowhead Springs area is characterized by the noise environment associated with these stationary sources and through traffic on SR-18.

Field Survey

The Planning Center conducted field monitoring on Tuesday, June 1, 2005, in conjunction with the development of the General Plan Update. Five separate noise level measurements were obtained to determine the ambient noise levels of areas where the largest potential traffic noise impacts would occur due to the proposed project. Noise monitoring locations were chosen based on the traffic distribution of the proposed Arrowhead Springs development with construction of the proposed alignment that provides site ingress/egress to 40th Street in San Bernardino. The noise monitoring locations are shown in Figure 5.10-1, Noise Monitoring Locations. Additional details on the monitoring program are covered in Appendix D, Noise Data. The results of the noise monitoring are presented in Table 5.10-10.

Noise Monitoring Locations



5 Noise Monitoring Locations

City Boundary

Sphere of Influence Boundary

NOT TO SCALE

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Table 5.10-10
Noise Measurements Along Local Roadways

Monitoring Site	L_{max}	L_{eq}	L_{min}
Monitoring Site #1	80.7	64.2	38.1
Monitoring Site #2	86.3	72.7	61.7
Monitoring Site #3	81.1	68.1	40.0
Monitoring Site #4	79.7	67.7	41.2
Monitoring Site #5	91.2	72.6	57.4

Noise monitoring conducted on June 1, 2005 during morning peak hours of 7:00 a.m. and 9:00 a.m.

Monitoring Site 1 — The sound level meter was located on the eastern side of Harrison Street, south of 37th Street. Primary noise sources were from local traffic and school buses traveling north-south on Harrison Street. Harrison Street is a two-lane roadway approximately 30 feet wide. The noise measurement was obtained during the morning peak traffic period. The western side of the roadway is separated from the percolation ponds by a 35 to 50 foot soil berm, which rises above houses on the east side of the roadway. Only back yards front this portion of Harrison Street and are separated from the roadway by an existing five- to six-foot block masonry wall, although, some yards have wood or chain linked fences. The noise meter was placed six feet from the block masonry wall directly adjacent to the roadway. There were no sidewalks.

Monitoring Site 2 — The sound level meter was located on 30th Street, east of Valencia and west of the percolation ponds. Thirtieth Street is a four-lane roadway with no median and approximately 44 feet wide. The noise measurement was obtained during the morning peak traffic period. The primary noise source is traffic along 30th Street, which includes a fair number of trucks. Secondary noise sources include SR-30, which is located approximately 300 feet south. State Road 30 is located below the grade of 30th Street. Housing in the neighborhood adjacent to 30th Street backs up to the roadway. However, only a few houses had five-foot block masonry walls, with the majority having wood fencing instead. The meter was placed three feet away from the wood fence and two feet from the roadway. There were no sidewalks.

Monitoring Site 3 — The sound level meter was located on 40th Street west of Harrison Street and east of the proposed intersection with the new access road to the Arrowhead Springs development (Village Parkway). Fortieth Street is a four-lane roadway with no median and approximately 51 feet wide. The noise measurement was obtained during the morning peak traffic period. Primary noise source was traffic along 40th Street. Currently, trucks arrive once every five minutes from the unimproved roadway, which is proposed to be modified for the Arrowhead Springs development. Trucks turn left (head east) on 40th Street then enter the percolation ponds to the south, for soil disposal/haul. After disposal, trucks turn left on 40th and continue west. It should be noted that this truck activity is an interim activity being conducted by the San Bernardino County Flood Control District to remove of excess debris from the percolation basins. Noise measurements were taken east of this truck entrance. Noise meter was placed eight feet from the roadway.

Monitoring Site 4 — The sound level meter was located on 40th Street east of the proposed roadway for Arrowhead Springs and west of Waterman Canyon Road (SR-18). Fortieth Street is

a four-lane roadway with no median at this location with street parking on the south side of the road which is approximately 58 feet wide. The noise measurement was obtained during the morning peak traffic period. Primary noise source was traffic on 40th Street. Houses that front 40th Street are separated from the roadway by a landscaped sidewalk area. The noise meter was placed on the three-foot sidewalk, approximately eight feet from the roadway.

Monitoring Site 5 — The sound level meter was located on 30th Street, west of Waterman Canyon Road (SR-18). Thirtieth Street is a four-lane roadway with no median and street parking is available on the northern side of 30th Street which is approximately 50 feet wide. The noise measurement was obtained during the morning peak traffic period. Noise monitoring was conducted three-feet in front of the existing residential property on 30th Street, two-feet from roadway, which faces the roadway with little obstruction from roadway noise sources. Primary noise source was traffic on 30th Street, although some ambient noise is generated by the SR-30, which is located below grade of 30th Street. Traffic at this intersection is very busy due to the SR-30 entrance approximately 300 feet to the east. Traffic during the a.m. peak hour backs up past Waterman Canyon Road and many trucks enter the highway at this location.

5.10.2 Thresholds of Significance

According to Appendix G of the CEQA Guidelines, a project would normally have a significant effect on he environment if the project would result in:

N-1 Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

N-2 Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.

N-3 A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.

N-4 A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

N-5 For a project located within an airport land use plan or where such a plan has not been adopted, within two miles of a public airport or public use airport, expose people residing or working in the project area to excessive noise levels.

N-6 For a project within the vicinity of a private airstrip, expose people residing or working the project area to excessive noise levels.

5.10.3 Environmental Impacts

The following impact analysis addresses thresholds of significance for which the Initial Study disclosed potentially significant impacts. The applicable thresholds are identified in parentheses after the impact statement.

5.10.3.1 San Bernardino General Plan

The General Plan Update is a guidance document for future development within the City of San Bernardino. The following is a discussion of the noise related impacts from full buildout potential of the San Bernardino General Plan. This impact analysis occasionally identifies full buildout as occurring in 2030 for ease of comparison, however no date for full buildout has been established.

GP IMPACT 5.10-1: PROJECT IMPLEMENTATION WOULD RESULT IN LONG-TERM OPERATION-RELATED NOISE THAT WOULD EXCEED LOCAL STANDARDS. [THRESHOLDS N-1, AND N-3]

Impact Analysis: Noise is regulated by numerous codes and ordinances across Federal, State, and local agencies. In addition, the City regulates noise-generating activities through the Municipal Code.

Operational Impacts

On-Road Mobile-Source Noise Impacts on Proposed Land Uses

The operational phase of individual projects that constitute the entirety of the General Plan update may generate noise from either stationary or vehicular sources.

Stationary Sources

Stationary sources of noises may occur from all types of land uses. Residential uses would generate noise from landscaping, maintenance activities, and air conditioning systems. Commercial uses would generate noise from heating, ventilation, air conditioning (HVAC) systems, loading docks and other sources. Industrial uses may generate HVAC systems, loading docks and possibly machinery. Noise generated by residential or commercial uses are generally short and intermittent. Industrial uses may generate noise on a more continual basis due to the nature of its activities.

The General Plan proposes nearly 106 million square-feet of new light and heavy industrial development. The siting of new industrial land uses may increase noise levels in their proximity. This can be due to the continual presence of heavy trucks used for the pick-up and delivery of goods and supplies; or from the use of noisy equipment actually used in the manufacturing or machining process. While vehicle noise is exempt from local regulation while operating on public roadways, for the purposes of the planning process, this noise may be regulated as a stationary-source while operating on private property. Previous studies have shown that heavy trucks produce a level of approximately 73 dBA L_{eq} as measured at a distance of 50 feet from the noisiest portion of the truck (i.e., to the side with the engine exposed).[1] The use of multiple trucks could generate noise levels on the order of 80 dBA L_{eq}; again as measured at a distance of 50 feet. Process equipment and the use of pneumatic tools could also generate elevated noise levels, but this equipment is typically housed within the facilities and would not be expected to exceed the 80 dBA L_{eq} projected for exterior trucks.

If it is assumed that the 80 dBA L_{eq} level were produced continually for a period of 8-hours during the day, the calculated CNEL is 75 dBA as measured at a distance of 50 feet. The 65 dBA CNEL would fall at a distance of 158 feet.

The General Plan has industrial uses located throughout the City. As mentioned previously, these industrial land uses are located adjacent to residential and other noise sensitive uses. The City also through Municipal Code Section 8.54.030 provides an exception to the noise regulations for noise generated in commercial or industrially zoned areas. Potential areas of land use-noise conflict could occur at the borders along the noise

[1] The Planning Center. Consolidated Volume Transfer Station and Recycling Facility (CVT). Anaheim. February 8, 1996.

sensitive uses. The impact could be significant if a new industrial source that emits excessive noise is allowed along such a border area.

On-Road Mobile-Source Noise Impacts on Existing Land Uses

Potential impacts on existing land uses stem mainly from the addition of project-generated vehicles along site access roads. Table 5.10 8 presents those routes with the potential for significant increase in noise due to growth anticipated under the General Plan. The increase or decrease in noise along all routes is included in Volume II, Appendix D, *Noise Data*. As expected, the greatest increases are expected in those areas subject to increased land use intensity or increased connectivity with major arterials such as freeways. While an increase of 3 or 5 dBA is potentially significant, it is only significant if it impacts sensitive land uses. The land uses most sensitive to exterior noise are playgrounds/parks and residential uses. The 63 dBA CNEL is the limit for playground and neighborhood park land uses which are considered conditionally acceptable based on Table 5.10-5 Community Noise and Land Use Compatibility matrix. The 65 dBA CNEL is the limit for residential land uses which are considered conditionally acceptable based on the City's Community Noise and Land Use Compatibility matrix. Commercial and industrial areas are not considered to be noise sensitive uses and have much higher tolerances for exterior noise levels.

The analysis, as performed, is required under CEQA and essentially assumes that the project would be built at one time and that the entirety of its traffic would be added to the existing volumes of traffic on the road. In actuality, project development would occur over a period of many years and the increase in noise on an annual basis would not be readily discernable because traffic and noise would increase incrementally. However, the largest increases in noise due to the General Plan Update need to be identified and as such a comparison of existing and future year 2030 build-out of the General Plan would be compared. As shown in Table 5.10 11, some of the roadways analyzed would experience noise levels in excess of the 3 dB threshold for noise sensitive uses. These increases in noise levels would occur at existing noise sensitive land uses and would exceed the City's land use compatibility standards for noise. The increase in traffic noise is due to the large increases in traffic volumes projected to occur with the build-out of the General Plan. As such, traffic generated noise attributable to the General Plan Update would result in significant noise impacts to existing noise sensitive uses.

Table 5.10-11
Build-out Traffic Volumes and Resultant Noise Levels Along Major Roadways Subject to Potentially Significant Change

	Existing Year					Future Year 2030 With Project					Increase in Noise Levels (dBA CNEL)
			Distance to CNEL Contour (Feet from Centerline)					Distance to CNEL Contour (Feet from Centerline)			
Segment	ADT	CNEL (dBA @ 50 Ft)	60	65	70	ADT	50.0 CNEL (dBA @ 50 Ft)	60	65	70	
4th Street											
I-215 – Arrowhead	1,208	61	58	27	12	24,633	74	430	200	93	13
5th Street											
Pepper – I-215	24,250	76	560	260	121	19,238	75	480	223	103	–1
I-215 – Waterman	28,290	76	621	288	134	24,007	76	557	258	120	–1
Waterman – Victoria	11,200	72	335	155	72	17,878	74	457	212	99	2
Victoria – Palm	1,965	65	105	49	23	14,370	73	395	183	85	9
9th Street											
Medical Center – I-215	4,495	67	138	64	30	5,219	67	153	71	33	1
I-215 – Waterman	6,018	68	168	78	36	8,367	69	209	97	45	1
Waterman – Tippecanoe	4,539	67	139	65	30	5,927	68	166	77	36	1
Tippecanoe – Del Rosa	4,745	67	143	67	31	5,712	68	162	75	35	1

Table 5.10-11
Build-out Traffic Volumes and Resultant Noise Levels Along Major Roadways Subject to Potentially Significant Change

Segment	Existing Year					Future Year 2030 With Project					Increase in Noise Levels (dBA CNEL)
	ADT	CNEL (dBA @ 50 Ft)	Distance to CNEL Contour (Feet from Centerline)			ADT	50.0 CNEL (dBA @ 50 Ft)	Distance to CNEL Contour (Feet from Centerline)			
			60	65	70			60	65	70	
40th Street											
Valencia – Waterman	8,910	71	251	117	54	17,908	74	401	186	86	3
Waterman – Sierra	18,879	72	310	144	67	22,625	73	349	162	75	1
Sierra – Mountain View	15,810	71	275	128	59	31,279	74	433	201	93	3
Baseline Street											
SR-30 – Palm	6,940	69	185	86	40	25,185	74	436	203	94	6
Palm – Valencia	14,670	72	304	141	66	34,286	75	536	249	115	4
Valencia – I-215	24,141	77	634	294	137	23,585	76	624	290	134	0
I-215 – Riverside	18,680	74	412	191	89	18,194	74	405	188	87	0
Highland Avenue											
Riverside – I-215	26,028	73	383	178	83	8,447	68	181	84	39	–5
I-215 – Victoria	15,150	71	267	124	58	26,775	73	391	181	84	2
Victoria – SR-30	18,930	72	310	144	67	27,788	74	400	186	86	2
SR-30 – E. City Limit	12,970	72	323	150	70	23,666	75	482	224	104	3
Hospitality Lane											
E Street – Hunts	25,820	73	381	177	82	13,972	71	253	118	55	–3
Hunts – Waterman	25,750	73	381	177	82	18,460	72	305	142	66	–1
Mill Street											
Tippecanoe – Waterman	13,040	71	281	131	61	19,150	73	363	169	78	2
Waterman – Mt. Vernon	16,179	71	279	130	60	30,155	74	423	196	91	3
Mt Vernon – Bordwell	15,680	71	273	127	59	31,126	74	432	200	93	3
Redlands Boulevard											
I-215 – Waterman	14,554	72	303	141	65	18,011	73	349	162	75	1
Rialto Avenue											
Riverside – Rancho	12,250	70	232	108	50	16,287	71	280	130	60	1
Rancho – I Street	10,050	69	203	94	44	16,970	71	288	134	62	2
I Street – Sierra	8,410	68	181	84	39	8,628	68	184	85	40	0
Sierra – Tippecanoe	2,920	64	89	41	19	7,688	68	170	79	37	4
Boulder Avenue											
Atlantic -Pacific	10,910	72	329	153	71	14,853	74	404	188	87	1
Del Rosa Drive											
3rd Street – Paloma	6,040	67	145	67	31	14,877	71	264	123	57	4
Baseline – SR-30	8,110	68	176	82	38	21,995	73	343	159	74	4
SR-30 – Quail Canyon	4,070	66	129	60	28	1,445	62	65	30	14	–4
E Street											
I-10- Fairway	18,134	73	351	163	76	23,208	74	413	192	89	1
Fairway – 9th Street	8,770	70	216	100	47	18,814	73	359	167	77	3
9th St – Kendall	17,740	73	345	160	74	35,103	76	544	253	117	3
Palm Avenue											
Pacific – Highland	9,940	71	271	126	58	19,826	74	429	199	92	3
Pepper Avenue											
I-10 – Foothill	16,420	73	378	175	81	44,034	77	730	339	157	4

Table 5.10-11
Build-out Traffic Volumes and Resultant Noise Levels Along Major Roadways Subject to Potentially Significant Change

Segment	Existing Year					Future Year 2030 With Project					Increase in Noise Levels (dBA CNEL)
	ADT	CNEL (dBA @ 50 Ft)	Distance to CNEL Contour (Feet from Centerline)			ADT	50.0 CNEL (dBA @ 50 Ft)	Distance to CNEL Contour (Feet from Centerline)			
			60	65	70			60	65	70	
Rancho Avenue											
I-10 – Mill	10,566	70	245	113	53	21,870	73	397	184	86	3
Mill – Rialto	10,566	70	245	113	53	23,685	74	419	194	90	4
Rialto – Foothill	5,770	68	163	76	35	20,783	73	384	178	83	6
Sierra Way											
Waterman – 40th Street	9,000	70	220	102	47	37,828	76	572	266	123	6
40th Street – 5th Street	7,000	68	160	74	34	2,112	62	72	33	15	–5
5th Street – 2nd Street	9,336	69	194	90	42	5,505	67	136	63	29	–2
2nd Street – Mill	3,385	64	98	46	21	5,789	67	141	65	30	2
Victoria Avenue											
Lynwood – Baseline	7,720	69	198	92	43	9,412	70	226	105	49	1
Baseline – 3rd Street	6,380	68	175	81	38	6,158	68	171	79	37	0
Waterman Avenue											
I-10 – Highland	22,144	74	400	186	86	26,590	74	452	210	97	1
Highland – Sierra	18,480	75	468	217	101	24,062	76	557	259	120	1
Freeways											
10 Freeway											
Jct. I-215 to Waterman	182,350	86	2752	1278	593	286,000	88	3715	1725	800	2
Waterman to Tippecanoe	149,470	85	2411	1119	519	264,000	88	3522	1635	759	2
Tippecanoe to Mountain View	148,420	85	2399	1114	517	264,000	88	3522	1635	759	3
Interstate 215											
Jct. I-10 to Orange Show Road	144,220	85	2354	1093	507	220,000	87	3119	1448	672	2
Orange Show Road to Inland Center Drive	135,780	85	2261	1050	487	220,000	87	3119	1448	672	2
Jct. Route 66 to Baseline	113,690	84	2009	932	433	242,000	87	3324	1543	716	3
Jct. SR-30 to University Parkway	55,790	81	1250	580	269	132,000	85	2219	1030	478	4
State Route 259											
Junction SR-30	67,000	82	1,412	655	304	100,500	84	1,850	859	399	2
E Street	67,000	82	1,412	655	304	100,500	84	1,850	859	399	2
End Route 259	55,000	81	1,238	575	267	82,500	83	1,622	753	349	2
State Route 30											
Highland to Jct. I-215	15,260	75	527	244	113	154,000	85	2459	1141	530	10
Jct. I-215 to H Street	31,580	78	855	397	184	132,000	85	2219	1030	478	6
H Street to SR-259	32,630	79	874	406	188	132,000	85	2219	1030	478	6
Route 259 to Waterman	66,670	82	1407	653	303	176,000	86	2688	1248	579	4
Waterman to Del Rosa	66,670	82	1407	653	303	132,000	85	2219	1030	478	3
State Route 330											
Junction SR-30	11,500	74	436	202	94	17,250	76	571	265	123	2
Running Springs Junction SR-18	12,400	74	459	213	99	18,600	76	601	279	129	2

On-Road Mobile-Source Noise Impacts on Proposed Land Uses

An impact could be significant if the project sites sensitive land uses in areas that do not meet the environmental goals of the City for the area in which they are to be situated. The noise contours for existing conditions and General Plan projected build-out conditions are presented in Table 5.10-12. As noted in the prior discussion, for the purposes of this analysis, impacts on sensitive areas are considered significant if a CNEL of 63 and 65 dBA are exceeded. These standards shall then serve as the basis of the impact analysis.

The General Plan presents the anticipated buildout vehicle-generated noise contours and proposed land use designations. There are areas in the City where noise levels would potentially exceed the 63 and 65 dBA CNEL noise contours for playground, park and residential areas. Furthermore, other sensitive land uses, such as schools, churches, or recreational uses may be exposed to noise levels which exceed the 65 dBA CNEL contours generated by on-road vehicles. This is especially true in those areas that lie near the freeways. Any siting of sensitive land uses within these contours then represents a potentially significant impact and would require a separate noise study through the development review process to determine the level of impacts and required mitigation. The General Plan Noise Element does contain a number of policies, to minimize potential noise impacts on sensitive land uses.

Railroad Noise Impacts

Noise generated by railroads is dependant on the quantity of trains utilizing the railroads that traverse the City. The number of trains occurring in the future is predicted to increase substantially due to the increased freight arriving at southern Californian seaports and the projected increases in the number of people using commuter trains. This increased freight is due primarily to increases in the international trade of goods. As such, the need for trains is projected to increase to transport these goods. The Southern California Association of Governments (SCAG) has published "The Los Angeles-Inland Empire Railroad Main Line Advanced Planning Study" which provides estimates of train volumes for existing and future conditions. Table 5.10-12 below presents the projected train volumes.

Table 5.10-12
Daily Train Volume Estimates

Line	*Year 2000*	*Year 2010*	*Year 2025*
Union Pacific Yuma Line	44	64	95
Union Pacific Palmdale Line	6.5	7.5	8.8
Burlington Northern Santa Fe Cajon Line	96	136	198
San Bernardino Metrolink Line	30	42	50
Inland Empire Orange County (IEOC) Metrolink Line	11	24	32

Source: The Los Angeles-Inland Empire Railroad Main Line Advanced Planning Study. Southern California Association of Governments

Noise from these operations was modeled using the horn model distributed by the Federal Railroad Administration. Modeling predicts that the 65 dBA Ldn noise contour falls at varying distances as shown in Table 5.10-13. These noise levels occur from 1,300 feet from the at-grade crossing. Noise levels with just the noise generated by the train without the horn would result in lower noise levels as shown in Table 5.10-7. The General Plan update may contribute to increasing train traffic incrementally due to the increased demand of goods development of industrial uses and increases in persons using commuter trains. However, as mentioned previously, the large increase in train traffic is primarily due to the increased demand for goods produced internationally. The increases in train traffic would result in further exposing noise sensitive uses to noise exposure and increase the level of noise experienced at noise sensitive uses. The General Plan update may also result in the intensified use of noise sensitive uses near railroad tracks thereby exposing additional

people to excessive amounts of noise. As such, significant noise impacts would occur due to noise sensitive uses being exposed to greater levels of train noise.

Table 5.10-13
Train Noise Estimates
(Distance in feet to 65 dBA Ldn Contour)

Line / Condition	Year 2000	Year 2010	Year 2020
Union Pacific Yuma Line			
With Horn Sounding	859	983	1131
Without Horn Sounding	618	713	826
Union Pacific Palmdale Line			
With Horn Sounding	408	433	462
Without Horn Sounding	279	298	319
Burlington Northern Santa Fe Cajon Line			
With Horn Sounding	1,135	1,281	1,457
Without Horn Sounding	829	941	1,076
San Bernardino Metrolink Line			
With Horn Sounding	745	844	900
Without Horn Sounding	532	607	649
Inland Empire Orange County Metrolink Line			
With Horn Sounding	505	685	763
Without Horn Sounding	352	486	545

Source: The Los Angeles-Inland Empire Railroad Main Line Advanced Planning Study. Southern California Association of Governments

GP IMPACT 5.10-2: ***BUILDOUT OF THE SAN BERNARDINO GENERAL PLAN WOULD CREATE SHORT-TERM AND LONG-TERM GROUNDBORNE VIBRATION AND GROUND-BORNE NOISE. [THRESHOLD N-2]***

Impact Analysis: Buildout of the General Plan Update could potentially expose people to the impacts of groundborne vibration or noise levels. Vibration related impacts could potentially result in impacts from the generation of substantial levels of vibration from construction and industrial activities. Vibration impacts could also occur by placing vibration sensitive uses proximate to railroads which are substantial sources of vibration.

Construction Vibration Impacts

On-Road Mobile-Source Vibration Impacts

Caltrans has studied the effects of propagation of vehicle vibration on sensitive land uses. Caltrans notes that "heavy trucks, and quite frequently buses, generate the highest earthborn vibrations of normal traffic." Caltrans further notes that the highest traffic generated vibrations are along the freeways. Their study finds that "vibrations measured on freeway shoulders (5 meters from the centerline of the nearest lane) have never exceeded 0.08 inch per second (in/sec), with the worst combinations of heavy trucks. This level coincides with the maximum recommended "safe level" for ruins and ancient monuments (and historic buildings). Because sensitive land uses are not and will not be sited within this distance, any potential for significant vibration impacts is less than significant.

Railroad Vibration Impacts

Caltrans has studied the effects of propagation of train vibration on sensitive land uses and notes that train vibration levels may be quite high, depending on the speeds, load, condition of track, and amount of ballast used to support the track. Caltrans obtained measurement of train vibrations and using their highest recorded value, prepared a "drop-off curve." The curve represents the maximum expected levels from trains, and is considered by Caltrans to be "very conservative." The curve demonstrates that 0.08 in/sec level, the maximum recommended "safe level" for ruins and ancient monuments and used here as a significance threshold, occurs at a distance of 25 feet from the rails. The 0.2 in/sec level, at which there is a risk of architectural damage occurs at a distance of about 7.5 feet from the rails. Because sensitive land uses are not and will not be sited within these distances, any potential for significant vibration impacts due to structural damage is less than significant.

Vibration can also lead to annoyance due to windows, picture frames or other items rattling and in extreme cases direct perception of vibration. The Federal Transit Administration has established screening distances for vibration assessments. Table 5.10-14 shows the distances at which vibration induced annoyance would not be expected to occur. Vibration generation and propagation is specific to the area analyzed because factors such as geology, railroad track conditions, train suspension and train wheel conditions can all affect vibration experienced at sensitive receivers. As such, site specific analyses would need to be conducted if projects are located within these screening distances. The screening distance for residential uses is 200 feet for railroads. Because there are vibration sensitive uses located within these distances, significant vibration impacts may occur due to vibration induced annoyance.

Table 5.10-14
Screening distances for Vibration Induced Annoyance (feet)

Type of Project	*Vibration Sensitive Uses*	*Residential Uses*	*Institutional Uses*
Conventional Commuter Railroad	600	200	120
Bus Projects	100	50	NA

Industrial Vibration Impacts

The use of heavy equipment (e.g., stamping tools) associated with industrial operations can create elevated vibration levels in their immediate proximity. However, vibration generated by machinery is regulated under the City's municipal code section 15.68.20. Compliance with this section would result in vibration levels that are considered acceptable to the City. As such, no significant vibration impacts would occur from vibration generated by industrial uses.

GP IMPACT 5.10-3: ***CONSTRUCTION ACTIVITES ASSOCIATED WITH BUILDOUT OF THE SAN BERNARDINO GENERAL PLAN WOULD RESULT IN TEMPORARY NOISE INCREASES IN THE VICINITY OF THE PROPOSED PROJECT. [THRESHOLD N-4]***

Impact Analysis: The City regulates noise-generating activities through the Municipal Code. Pursuant to Section 8.54.020 of the City of San Bernardino Municipal Code, construction activities are prohibited between the hours of ten p.m. and seven a.m.

Short-term noise impacts are impacts associated with demolition, site preparation, grading and building construction of the proposed land uses. Two types of short-term noise impacts could occur during construction. First, the transport of workers and movement of materials to and from the site could incrementally

increase noise levels along local access roads. The second type of short-term noise impact is related to noise generated at the job site during demolition, site preparation, grading, and/or physical construction. Construction is performed in distinct steps, each of which has its own mix of equipment, and, consequently, its own noise characteristics. However, despite the variety in the type and size of construction equipment, similarities in the dominant noise sources and patterns of operation allow construction-related noise ranges to be categorized by work phase. Table 5.10-15 lists typical construction equipment noise levels recommended for noise impact assessments as based on a distance of 50 feet between the equipment and a noise receptor.

Composite construction noise is best characterized by Bolt, Beranek and Newman (EPA December 31, 1971). In their study, construction noise for commercial and industrial development is presented as 89 dBA L_{eq} when measured at a distance of 50 feet from the construction effort. Residential development is slightly quieter with a composite noise level of about 88 dBA L_{eq}, again when measured at a distance of 50 feet from the construction effort. These values take into account both the number of pieces and spacing of the heavy equipment used in the construction effort. In later phases during building assembly, noise levels are typically reduced from these values and the physical structures further break up line-of-sight noise propagation.

Table 5.10-15
Noise Levels Generated by Typical Construction Equipment

Type of Equipment	*Range of Sound Levels Measured (dBA at 50 feet)*	*Suggested Sound Levels for Analysis (dBA at 50 feet)*
Pile Drivers, 12,000 to 18,000 ft-lb/blow	81 to 96	93
Rock Drills	83 to 99	96
Jack Hammers	75 to 85	82
Pneumatic Tools	78 to 88	85
Pumps	68 to 80	77
Dozers	85 to 90	88
Tractor	77 to 82	80
Front-End Loaders	86 to 90	88
Hydraulic Backhoe	81 to 90	86
Hydraulic Excavators	81 to 90	86
Graders	79 to 89	86
Air Compressors	76 to 86	86
Trucks	81 to 87	86

Source: Noise Control for Buildings and Manufacturing Plants," Bolt, Beranek and Newman, 1987.

Based on the 89 dBA L_{eq} value, and assuming that construction were to occur for 8 hours a day, the CNEL is calculated at 84 dBA at 50 feet (83 dBA CNEL for residential construction). The 65 dBA CNEL contour would fall at a distance of about 446 feet (397 feet for residential construction). These impacts are considered less than significant at the project level through the enforcement of the San Bernardino Municipal Code and in a broader sense through the policies of the General Plan Noise Element.

GP IMPACT 5.10-4: ***THE SAN BERNARDINO INTERNATIONAL AIRPORT IS LOCATED WITHIN THE CITY OF SAN BERNARDINO, RESULTING IN EXPOSURE OF FUTURE RESIDENTS TO AIRPORT-RELATED NOISE. [THRESHOLDS N-5 AND N-6]***

Impact Analysis: The San Bernardino International Airport is located within the City of San Bernardino. Airport Noise generated from large aircraft contribute to the noise environment within the City. Noise from aircraft is produced from takeoff, flyovers/over flights, and approach/landings. Each of these events results in noise exposure to populations living in close proximity to the airport. The San Bernardino International

Airport is operated under a Joint Powers Authority. Currently the SBIAA is in the process of preparing the Airport Master Plan and the Comprehensive Land Use Plan (CLUP). As a consequence, the precise noise contours were not available to include in the General Plan Update. Upon adoption of the Airport Master Plan and CLUP, the new noise contours shall be incorporated into Figure LU-4 of the City of San Bernardino General Plan, in accordance with Section 21676 of the Public Utilities Code. In the interim, the City of San Bernardino regulates noise from aircraft under the City's Municipal Code, which are based on noise contours from the former Norton Air Force Base and the interim Airport Operating Plan. However, the noise contours from the former Norton Air Force Base were based on military aircraft, and current operations as an international airport may have different noise contours due to the type and frequency of commercial aircraft anticipated at the San Bernardino International Airport. Prior to the inclusion of noise contours with the Airport Master Plan and CLUP, no analysis of potential noise impacts from the operation of the Airport is possible. As a result impacts are significant.

Furthermore, the existing land uses under the flight path, for the San Bernardino International Airport include noise sensitive uses, including parkland and residential units. The City of San Bernardino considers both residential and parkland as sensitive noise use in the City (See Figure N-1 of the San Bernardino General Plan Update, *Land Use Compatibility for Community Noise Exposure).* During the creation of the Airport Land Use Plan by the SBIAA, potential incompatibility with existing residential uses and the airport is required to be addressed. However, the FAA does not consider parkland to be a sensitive use (except for crash zones and parks containing water) and therefore may not analyze the incompatibility between the existing parkland use and the operations of the San Bernardino International Airport. As a result, there is an inherent incompatibility with the parkland and operation of the San Bernardino International Airport, which may result in exposure of visitors to noise levels that exceed noise compatibility standards established in the General Plan.

In addition to aircraft noise from the San Bernardino International Airport, local helicopter air traffic is commonplace throughout the City. News and other helicopters (e.g., freeway traffic report helicopters) fly through the area. Helicopter use for fire and police and at hospitals is considered as an emergency activity and is addressed by FAA regulations. The noise exposure generated by helicopter activity varies dependant on flight path which is determined by wind direction. There are currently five heliports in San Bernardino (National Orange Show, Red Dog Properties, San Bernardino Community Hospital, SCE Eastern Division, and in the Tri-City area). Individual projects occurring as part of the General Plan would have to be analyzed on a project specific basis.

General Plan Relevant Policies and Programs

The relevant General Plan goals and policies pertaining to noise include the following:

Land Use Element

Policy 2.9.1: Require that all new development be consistent with the adopted Comprehensive Land Use Plan for the San Bernardino International Airport and ensure that no structures or activities encroach upon or adversely affect the use of navigable airspace.

Policy 2.9.2: Refer any adoption or amendment of this General Plan, specific plan, zoning ordinance, or building regulation within the planning boundary of the adopted Comprehensive Airport Master Plan for the SBIA to the airport authority as provided by the Airport Land Use Law.

Policy 2.9.3: Limit the type of development, population density, maximum site coverage, and height of structures as specified in the applicable safety zones in the Comprehensive Land Use Plan for the SBIA and as shown on Figure LU-4.

Policy 2.9.4: Limit the development of sensitive land uses (e.g. residential, hospitals, schools) within the 65 decibel (dB) Community Noise Equivalent Level (CNEL) contour, as shown on Figure LU-4.

Circulation Element

Policy 6.4.1: Work with Caltrans to ensure that construction of new facilities includes appropriate sound walls or other mitigating noise barriers to reduce noise impacts on adjacent land uses.

Policy 6.4.8: Develop appropriate protection measures along routes frequently used by trucks to minimize noise impacts to sensitive land uses including but not limited to residences, hospitals, schools, parks, daycare facilities, libraries, and similar uses.

Policy 6.5.1: Provide designated truck routes for use by commercial/industrial trucking that minimize impacts on local traffic and neighborhoods.

Policy 6.7.3: Encourage the provision of a buffer between residential land uses and railway facilities and encourage the construction of sound walls or other mitigating noise barriers between railway facilities and adjacent land uses.

Noise Element

Policy 14.1.1: Minimize, reduce, or prohibit, as may be required, the new development of housing, health care facilities, schools, libraries, religious facilities, and other noise sensitive uses in areas where existing or future noise levels exceed an Ldn of 65 dB(A) exterior and an Ldn of 45 dB(A) interior if the noise cannot be reduced to these levels.

Policy 14.1.2: Require that automobile and truck access to commercial properties abutting residential parcels be located at the maximum practical distance from the residential parcel.

Policy 14.1.3: Require that all parking for commercial uses abutting residential areas be enclosed within a structure, buffered by walls, and/or limited hours of operation.

Policy 14.1.4: Prohibit the development of new or expansion of existing industrial, commercial, or other uses that generate noise impacts on housing, schools, health care facilities or other sensitive uses above a Ldn of 65 dB(A).

Policy 14.2.1: Work with Caltrans to landscape or install mitigation elements along freeways and highways adjacent to existing residential subdivisions or noise-sensitive uses to reduce noise impacts.

Policy 14.2.2: Employ noise mitigation practices when designing future streets and highways, and when improvements occur along existing road segments. Mitigation measures should emphasize the establishment of natural buffers or setbacks between the arterial roadways and adjoining noise-sensitive areas.

Policy 14.2.3: Require that development that increases the ambient noise level adjacent to noise-sensitive land uses provide appropriate mitigation measures.

Policy 14.2.4: Maintain roadways so that the paving is in good condition and free of cracks, bumps, and potholes.

Policy 14.2.5: Require sound walls, berms, and landscaping along existing and future highways and railroad right-of-ways to beautify the landscape and reduce noise.

Policy 14.2.6: Buffer residential neighborhoods from noise caused by train operations and increasing high traffic volumes along major arterials and freeways.

Policy 14.2.7: Require heliports/helistops to comply with Federal Aviation Administration standards.

Policy 14.2.8: Minimize noise attributable to vehicular travel in residential neighborhoods by inhibiting through trips by the use of cul-de-sacs, one-way streets, and other traffic controls.

Policy 14.2.9: Enforce sections of the California Vehicle Code related to mufflers and modified exhaust systems.

Policy 14.2.10: Provide for the development of alternate transportation modes such as bicycle paths and pedestrian walkways to minimize the number of automobile trips.

Policy 14.2.11: Require that new equipment and vehicles purchased by the City comply with noise performance standards consistent with the best available noise reduction technology.

Policy 14.2.12: Require that commercial and industrial uses implement transportation demand management programs consistent with the Air Quality Management Plan that provide incentives for car pooling, van pools, and the use of public transit to reduce traffic and associated noise levels in the City.

Policy 14.2.13: Work with local agencies and businesses to provide public transit services that reduce traffic and associated noise.

Policy 14.2.14: Work with public transit agencies to ensure that the buses, vans, and other vehicles used do not generate excessive noise levels.

Policy 14.2.15: Work with all railroad operators in the City to properly maintain lines and establish operational restrictions during the early morning and late evening hours to reduce impacts in residential areas and other noise sensitive areas.

Policy 14.2.16: Work with all railroad operators to install noise mitigation features where operations impact existing adjacent residential or other noise-sensitive uses.

Policy 14.2.17: Ensure that new development is compatible with the noise compatibility criteria and noise contours as defined in the Comprehensive Land Use Plan for the SBIA and depicted in Figure LU-4.

Policy 14.2.18: Limit the development of sensitive land uses located within the 65 decibel (dB) Community Noise Equivalent Level (CNEL) contour, as defined in the Comprehensive Land Use Plan for the SBIA and depicted in Figure LU-4.

Policy 14.2.19: As may be necessary, require acoustical analysis and ensure the provision of effective noise mitigation measures for sensitive land uses, especially residential uses, in areas significantly impacted by noise.

Policy 14.3.1: Require that construction activities adjacent to residential units be limited as necessary to prevent adverse noise impacts.

Policy 14.3.2: Require that construction activities employ feasible and practical techniques that minimize the noise impacts on adjacent uses.

Policy 14.3.3: Adopt and enforce a standard for exterior noise levels for all commercial uses that prevents adverse levels of discernible noise on adjoining residential properties.

Policy 14.3.4: Adopt and enforce a standard for exterior noise levels from the use of leaf blowers, motorized lawn mowers, parking lot sweepers, or other high-noise equipment on commercial properties if their activity will result in noise that adversely affects abutting residential parcels.

Policy 14.3.5: Require that the hours of truck deliveries to commercial properties abutting residential uses be limited unless there is no feasible alternative or there are overriding transportation benefits by scheduling deliveries at another hour.

Policy 14.3.6: Ensure that buildings are constructed soundly to prevent adverse noise transmission between differing uses located in the same structure and individual residences in multifamily buildings.

Policy 14.3.7: Require that commercial uses in structures containing residences on upper floors not be noise intensive.

Policy 14.3.8: Require common walls and floors between commercial and residential uses be constructed to minimize the transmission of noise and vibration.

5.10.3.2 Arrowhead Springs Specific Plan

Implementation of the Arrowhead Springs Specific Plan includes development of 1,350 residential dwelling units, 1,049,190 square-feet of commercial and office uses, 199-acre golf course, a new 300-room hotel, expansion of the sewage treatment plant and conference center, and expansion of the existing historic Arrowhead Springs Hotel. Much of the new development would be concentrated on approximately 556 acres of the approximately 1,916 acre site. Buildout of the Arrowhead Springs Specific Plan would result in additional vehicle trips to and from the resort recreational areas, residential, commercial, and office uses. The following is a discussion of the noise related impacts from buildout of the Arrowhead Springs Specific Plan.

AHS IMPACT 5.10-1: IMPLEMENTATION OF THE ARROWHEAD SPRINGS SPECIFIC PLAN WOULD RESULT IN LONG-TERM OPERATION-RELATED NOISE THAT WOULD EXCEED LOCAL STANDARDS. [THRESHOLDS N-1 AND N-3]

Impact Analysis: Potential noise impacts from stationary sources of noise and traffic generated noise are evaluated in relation to changes in the noise environment as a result of additional project-related traffic. The project seeks to develop a wastewater treatment plant, as well as residential, recreational, office and commercial uses. The proposed wastewater treatment plant is the only potential generator of substantial noise levels from stationary sources. The waste water treatment plant would employ numerous pumps and other wastewater treatment machinery that would generate noise at a local level. The proposed location of the wastewater treatment plant is located on the very south side of the project site. The nearest noise sensitive uses are the proposed 300 units of senior residential uses and a golf course. Noise levels generated from the wastewater treatment plant would depend on the treatment technology that is selected and the configuration of the plant. Potential noise impacts from the plant may occur due to the proximity of the plant to the proposed residential and golf course.

To quantify incremental traffic noise impacts, noise levels from existing traffic data were determined and compared to estimates of traffic noise generated by (1) future estimated traffic volumes without the proposed project and (2) future estimated traffic volumes, including the proposed project. Project-generated and cumulative traffic volumes were estimated using the Federal Highway Administration's Highway Traffic Noise Prediction Model. The potential for exceedance of the City's noise criteria is based on those roads that have the highest contribution of project traffic distribution and proximity to noise-sensitive receptors.

The modeling of traffic noise levels is based on data pertaining to traffic volumes, traffic speeds and the types of vehicles traveling on area roads. The modeling input was developed from the project traffic study, the FHWA Highway Traffic Noise Prediction Model and field observations. Table 5.10-15 provides traffic noise modeling for existing conditions, future year 2007 no project and with project conditions. Future year 2007 conditions include vehicle trips from related projects as detailed in the project's traffic study. Project related traffic would increase noise levels by a maximum of 1.3 dB along Harrison Street for the opening year 2007.

Other roadways would experience lower increases in traffic noise due to the project because the other roadways would have lower proportions of project related traffic versus background traffic.

Table 5.10-16
Modeled Traffic Noise for Opening Year
(dBA CNEL)

	Existing Year 2003	No Project Year 2007	With Project Year 2007	Project Increment[1]	Cumulative Increment[1]
SR-18 n/o Waterman Avenue	75.6	76.0	77.2	+1.2	+1.6
Waterman Avenue s/o 40th Street	74.3	74.6	75.7	+1.1	+1.4
Waterman Avenue n/o 30th Street	73.4	73.8	74.7	+0.9	+1.2
40th Street e/o Waterman Avenue	71.2	71.5	71.8	+0.3	+0.6
Harrison Street s/o 40th Street	58.9	59.3	60.6	+1.3	+1.7
Sterling Avenue s/o Foothill Drive	62.0	62.3	63.2	+0.9	+1.2
Valencia Avenue s/o 40th Street	66.3	66.6	66.6	–	+0.3
Valencia Avenue n/o 30th Street	66.5	66.9	66.9	–	+0.3

[1]The Project Increment is the difference between the Year 2007 No Project and With Project conditions. The cumulative increment is the difference between the Year 2007 With Project condition and Year 2003 conditions.
Source: The Planning Center (June 2005).

In the year 2030, the maximum increase in noise levels due to the buildout of the project would be 68.6 dBA CNEL along the new project roadway (Village Parkway) and 69.8 dBA CNEL along Harrison Parkway between 40th and 30th Street shown in Table 5.10-17. Though the new project roadway would result in large increases, the new roadway would not expose noise sensitive uses to noise because there are no noise sensitive uses along the roadway. For Harrison Parkway, this roadway would expose residential uses (rear yards) proximate to the roadway to substantial levels of noise. In addition, Sterling Avenue south of Foothill Drive would experience a noise level increase of 3.5 dBA CNEL on a cumulative basis due to project and background traffic growth from existing conditions to the year 2030. As such, significant project related traffic noise impacts would occur as a result of operation of the proposed project.

Table 5.10-17
Modeled Traffic Noise for Future Year 2030
(dBA CNEL)

	Existing Year 2003	No Project Year 2030	With Project Year 2030	Project Increment[1]	Cumulative Increment[1]
New Road – Project to 40th Street	NA	NA	73.3	+68.6	+68.6
Harrison Parkway – 40th to 30th Street	NA	NA	74.6	+69.8	+69.8
SR-18 n/o Waterman Avenue	75.6	76.6	76.8	+0.2	+1.2
Waterman Avenue s/o 40th Street	74.3	75.8	75.8	–	+1.5
Waterman Avenue n/o 30th Street	73.4	74.0	74.0	–	+0.6
40th Street e/o Waterman Avenue	71.2	73.6	73.9	+0.3	+2.7
Sterling Avenue s/o Foothill Drive	62.0	63.5	65.5	+2.0	+3.5
Valencia Avenue s/o 40th Street	66.3	67.0	68.0	+1.0	+1.7
Valencia Avenue n/o 30th Street	66.5	67.2	68.1	+0.9	+1.6

[1]The Project Increment is the difference between the Year 2030 No Project and With Project conditions. The cumulative increment is the difference between the Year 2030 With Project condition and Year 2003 conditions.
Source: The Planning Center (June 2005).

AHS IMPACT 5.10-2: IMPLEMENTATION OF THE ARROWHEAD SPRINGS SPECIFIC PLAN PROJECT WOULD CREATE SHORT-TERM AND LONG-TERM GROUNDBORNE VIBRATION AND GROUNDBORNE NOISE. [THRESHOLD N-2]

Impact Analysis: Construction activities can generate varying degrees of ground vibration, depending on the construction procedures and the construction equipment. Operation of construction equipment generates vibrations which spread through the ground and diminish in amplitude with distance from the source. The effect on buildings located in the vicinity of the construction site often varies; depending on soil type, ground strata and receptor building construction. The results from vibration can range from no perceptible effects at the lowest vibration levels, to low rumbling sounds and perceptible vibrations at moderate levels, and slight damage at the highest levels. Ground vibrations from construction activities rarely reach the levels that can damage structures, but can achieve the audible and perceptible ranges in buildings close to a construction site. Ground-borne vibration would be generated by the proposed project during construction activities. Vibration generation would primarily occur during the demolition, grading and foundation phases of construction. Unless there are extremely large generators of vibration such as pile drivers or in close proximity of sources of vibration, vibration is generally perceptible at structures where vibration would rattle windows, picture frames and other objects. Table 5.10-18 lists vibration source levels for construction equipment as well as the vibration levels experienced at the nearest structures.

Table 5.10-18
Vibration Source Levels For Construction Equipment

Vibration Annoyance Assessment			
Equipment	**Velocity Level at 25 Feet (VdB)**	**Significance Threshold (VdB)**	**Exceeds Significance Threshold?**
Scraper (Large bulldozer)	87	72	No
Small bulldozer	58	72	No
Loaded trucks	86	72	No
Structural Damage Assessment			
Equipment	**Approximate RMS Velocity at 25 Feet (in/sec)**	**Significance Threshold (VdB)**	**Exceeds Significance Threshold?**
Scraper (Large bulldozer)	0.089	0.2	No
Small bulldozer	0.003	0.2	No
Loaded trucks	0.076	0.2	No

[1] Determined based on use of jackhammers or pneumatic hammers that may be used for pavement demolition at a distance of 25 feet.
Notes: RMS velocity calculated from vibration level (VdB) using the reference of one microinch/second.
Source: The Planning Center, (October 2004) based on methodology from the United States Department of Transportation Federal Transit Administration, *Transit Noise and Vibration Impact Assessment* (1995).

Based on procedures established by the Federal Transit Administration (FTA) Manual, Root Mean Square (RMS) vibration velocities from construction equipment operations are expected to range from 0.003 to 0.089 in/sec (58 to 87 VdB) at a reference distance of 25 feet. Vibration sensitive uses in the specific plan area consist of the historical spa and hotel uses in addition to the San Bernardino National Forrest. Because detailed construction information is not currently available, a conservative approach was taken in which the project could possibly entail construction equipment operating in close proximity to the above mentioned vibration sensitive uses and result in levels of vibration that would exceed United States Department of Transportation's (USDOT's) significance threshold for vibration annoyance of 72 VdB. This threshold is established for potential human annoyance. Construction activities would potentially result in significant adverse impacts from vibration induced human annoyance at the nearest vibration sensitive uses.

The RMS velocity produced by construction activities would not exceed the USDOT's building damage significance threshold of 0.20 in/sec for fragile structures. Therefore, construction activities would not result in significant adverse vibration induced structural damage impacts at the nearest vibration sensitive uses.

AHS IMPACT 5.10-3: CONSTRUCTION ACTIVITES ASSOCIATED WITH THE ARROWHEAD SPRINGS SPECIFIC PLAN WOULD RESULT IN TEMPORARY NOISE INCREASES IN THE VICINITY OF THE PROPOSED PROJECT. [THRESHOLD N-4]

Impact Analysis: The City regulates noise-generating activities through the Municipal Code. Pursuant to Section 8.54.020 of the City of San Bernardino Municipal Code, construction is prohibited between the hours of ten p.m. and seven a.m.

Short-term noise impacts are impacts associated with demolition, site preparation, grading and construction of the Arrowhead Springs Specific Plan project are similar to the General Plan and are discussed above in General Plan Impact 5.10-1. Based on the 89 dBA L_{eq} value and assuming that construction were to occur for 8 hours a day, the CNEL is calculated at 84 dBA at 50 feet (83 dBA CNEL for residential construction). The 65 dBA CNEL contour would fall at a distance of about 446 feet (397 feet for residential construction). The nearest noise sensitive uses to development areas of the Arrowhead Springs area are the existing resort uses and the San Bernardino National Forest. Other residential uses to the east of the southern boundary would be more than 400 feet away from the nearest construction activities. Mitigation of these impacts to a level that is less than significant would be conducted through the enforcement of the San Bernardino Municipal Code and in a broader sense through the policies of the General Plan Noise Element.

AHS IMPACT 5.10-4: THE ARROWHEAD SPRINGS SPECIFIC PLAN AREA IS NOT LOCATED WITHIN THE VICINITY OF AN AIRPORT OR AIRSTRIP THAT WOULD RESULT IN EXPOSURE OF FUTURE RESDIENT, WORKERS, AND VISITORS TO AIRPORT-RELATED NOISE. [THRESHOLDS N-5 AND N-6]

Impact Analysis: The Arrowhead Springs Specific Plan area is not located within the vicinity of a public or private airport. The closest airport to the site is the San Bernardino International Airport located on the southern side of the City while the Arrowhead Springs area is located in the mountains to the north. The project site is anticipated to be outside of the 65 dBA CNEL noise contour of the Airport due to the large distance between the Airport and the project site.

5.10.4 Existing Regulations and Standard Conditions

- The City of San Bernardino Municipal Code, Title 19, Section 19.20, Property Development Standards requires the following development standards for noise:
    - No loudspeaker, bells, gongs, buzzers, mechanical equipment or other sounds, attention-attracting, or communication device associated with any use shall be discernible beyond any boundary line of the parcel, except fire protection devices, burglar alarms and church bells. The following provisions shall apply:
        - A. In residential areas, no exterior noise level shall exceed 65dBA and no interior noise level shall exceed 45dBA.
        - B. All residential developments shall incorporate the following standards to mitigate noise levels:
            1. Increase the distance between the noise source and receiver.

2. Locate land uses not sensitive to noise (i.e., parking lots, garages, maintenance facilities, utility areas, etc.) between the noise source and the receiver.

3. Bedrooms should be located on the side of the structure away from major rights-of-way.

4. Quiet outdoor spaces may be provided next to a noisy right-of-way by creating a U-shaped development which faces away from the right-of-way.

C. The minimum acceptable surface weight for a noise barrier is 4 pounds per square foot (equivalent to 3/4 inch plywood). The barrier shall be of a continuous material which is resistant to sound including:

1. Masonry block

2. Precast concrete

3. Earth berm or a combination of earth berm with block concrete.

D. Noise barriers shall interrupt the line-of-sight between noise source and receiver.

- The City of San Bernardino Municipal Code, Title 8, Chapter 8.54, prohibits for any person to make, continue, or cause to be made or continued any loud, unnecessary and excessive noise which disturbs, offends, injures or endangers the peace, quiet, comfort, repose, health, or safety of any neighborhood or persons within the limits of the City. Under Section 5.54.020 the operation or use between the hours of ten p.m. and seven a.m. of any pile driver, steam shovel, pneumatic hammers, derrick, steam or electric hoist, power driven saw, or any other tool or apparatus, the use of which is attended by loud and excessive noise, except with the approval of the Mayor and Common Council is prohibited.

- The Federal Aviation Regulations (FAR) Part 36, Noise Standards, regulates aircraft noise at airports based on type of aircraft.

- Article 3.5 of the Public Utilities Code regulates land use compatibility of airports through designation of a airport commission to ensure public health and safety:

  - Section 21675.1 requires that if a commission has not yet adopted an airport land use compatibility plan, the city shall first submit all actions, regulations, and permits within the vicinity of a public airport to the commission for review and approval. "Vicinity" means land that will be included or reasonably could be included within the airport land use compatibility plan. If the commission has not designated an airport influence area for the airport land use compatibility plan, then "vicinity" means land within two miles of the boundary of a public airport.

5.10.5 Level of Significance Before Mitigation

5.10.5.1 San Bernardino General Plan

Upon implementation of regulatory requirements and standard conditions of approval, the following impacts would be less than significant:

GP Impact 5.10-3 The 65 dBA CNEL contour would fall at a distance of about 446 feet (397 feet for residential construction). Impacts are considered less than significant at the project

level through the enforcement of the San Bernardino Municipal Code and in a broader sense through the policies of the General Plan Noise Element.

Without mitigation, the following impacts would be **significant**:

GP Impact 5.10-1 Project implementation would result in long-term operation-related noise that would exceed local standards that may have significant noise impacts related to noise sources which include stationary, roadway, railroad and aircraft.

GP Impact 5.10-2 The project would create groundborne vibration and groundborne noise that may result in significant vibration impacts from vibration intensive construction activities and increased train travel along railroads.

GP Impact 5.10-4 The San Bernardino International Airport is located within the City. Although the City would be required to amend the General Plan once the Airport Land Use Plan has been adopted, currently no noise contours are available. In the interim, the City of San Bernardino regulates land uses around the airport through the existing noise ordinance based on noise contours from the former Norton Air Force Base. However, noise incompatibility with the existing designation of parkland underneath the existing flight path is anticipated to result in significant noise impacts on this sensitive use.

5.10.5.2 Arrowhead Springs Specific Plan

Upon implementation of regulatory requirements and standard conditions of approval, the following impacts would be less than significant:

AHS Impact 5.10-3 The 65 dBA CNEL contour would fall at a distance of about 446 feet (397 feet for residential construction. Impacts are considered less than significant at the project level through the enforcement of the San Bernardino Municipal Code and in a broader sense through the policies of the General Plan Noise Element.

AHS Impact 5.10-4 The Arrowhead Springs Specific Plan is not within the vicinity of a private or a public airport.

Without mitigation, the following impacts would be **significant**:

AHS Impact 5.10-1 Project implementation would result in long-term operation-related noise that would exceed local standards that may have significant noise impacts related to noise generated at the proposed wastewater treatment plant and the construction of the new Harrison Parkway roadway. Cumulative noise impacts would occur due project and background traffic in the year 2030 at Sterling Avenue south of Foothill Drive.

AHS Impact 5.10-2 The project would create groundborne vibration and groundborne noise that may result in significant vibration impacts from vibration intensive construction activities. Vibration intensive construction activities may temporarily lead to significant vibration impacts if vibration sensitive receivers are located proximate to the construction activities.

5.10.6 Mitigation Measures

5.10.6.1 San Bernardino General Plan

GP 5.10-1 Prior to the issuance of building permits for any project that involves a noise sensitive use within the 65 dBA CNEL contour along major roadways or freeway, railroads, or the San Bernardino International Airport, the project property owner/developers shall submit a final acoustical report prepared to the satisfaction of the Planning Director. The report shall show that the development will be sound-attenuated against present and projected noise levels, including roadway, aircraft, helicopter and railroad, to meet City interior and exterior noise standards.

GP 5.10-2 Adherence to Mitigation Measure GP 5.10-1 would result in exterior/interior noise levels within the City noise standards, as a result, vibration created from noise levels that exceed the City noise standards would also be mitigated.

GP 5.10-4 The City of San Bernardino shall incorporate into the General Plan the noise contour map developed for the SBIAA after completion of the Airport Master Plan.

5.10.6.2 Arrowhead Springs Specific Plan

AHS 5.10-1A A site specific acoustic study shall be conducted to analyze and mitigate noise levels along the existing Harrison Street from 40th to 30th Street and submitted to the Development Services Department with plans for road widening of Harrison Street. This acoustic study shall specify the necessary mitigation to achieve exterior noise level limits at residential uses proximate to the new Harrison Parkway. Mitigation measures may include the use of berms or sound walls to attenuate exterior noise levels.

AHS 5.10-1B A site specific acoustic study shall be conducted to evaluate and, if necessary, mitigate potential noise impacts from the proposed wastewater treatment plan on the golf course and residences located proximate to the project site. The study shall be submitted to the Development Services Department with building plans for approval. Mitigation, if necessary, shall be in compliance with the City's exterior and interior noise limits.

AHS 5.10-2A Prior to issuance of land disturbing permits for projects that would occur within 25 feet of sensitive uses, the project applicant shall submit a list of equipment to the Development Services Department demonstrating compliance with USDOT significance threshold for vibration annoyance of 72 VdB.

AHS 5.10-2B Prior to issuance of land disturbing permits for projects that would occur within 25 feet of sensitive uses, the project applicant shall submit a list of equipment to the Development Services Department demonstrating compliance with USDOT significance threshold for vibration induced structural damage of 0.20 in/sec.

5.10.7 Level of Significance After Mitigation

Although the mitigation measures listed above would reduce noise impacts, the following impacts would remain significant:

- GP Impact 5.10-4

  Until the Airport Master Plan has been adopted by the SBIAA and corresponding noise contours have been established the extent of impact to parkland near the airport cannot be determined. Parkland is designated as a sensitive use in the General Plan and should the noise contour exceed the limitations established by the General Plan no foreseeable mitigation could be accomplished if the park were to remain in use. Under those circumstances the impact would be considered a significant adverse and unavoidable impact.

- AHS Impact 5.10-1 and 5.10-2

  Noise along Sterling Avenue south of Foothill Drive would lead to noise level increases of 3.5 dBA CNEL which is not considered to be mitigable and would result in an unavoidable significant noise impact. Vibration impacts would also remain significant and unavoidable from vibration intensive construction activities.

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5.11 POPULATION AND HOUSING

This section examines whether Project implementation will result in significant population and housing impacts. This analysis focuses on population and housing impacts associated with the adoption and implementation of the proposed General Plan and adoption and implementation of the Arrowhead Springs Specific Plan, as these actions have the potential to either induce population growth (directly or indirectly) or displace substantial numbers of persons.

Current website information and pertinent documents from the City of San Bernardino as well other appropriate agencies was also used in preparation of this section. The analysis in this section is based, in part, upon sources of information from the following agencies:

- Southern California Association of Governments (SCAG)
- San Bernardino Associated Governments (SANBAG)
- City Housing Element

5.11.1 Environmental Setting

5.11.1.1 San Bernardino General Plan

The City's total planning area encompasses 45,231 acres, or 71 square miles. This includes 38,402 acres, or 60 square miles, of incorporated City and 6,829 acres, or 11 square miles, of unincorporated lands within the City's Sphere of Influence.

U.S. Census

According to the U.S. Census, the incorporated City of San Bernardino had a population of 185,401[1] in 2000, which accounted for approximately eleven percent (10.8 percent) of the County of San Bernardino's total population. This represents a 13 percent increase over the City's population in 1990 but less than the City's growth rate of 33 percent between 1980 and 1990. Likewise, the County of San Bernardino grew at a rate of 21 percent from 1990, which was a decrease from the 58 percent growth rate between 1980 and 1990. The population of the City of San Bernardino is still growing, but at a significantly reduced rate of less than 1 percent or less since 1994. The City's population and growth rates are shown in Table 5.11-1.

Census information is only provided for a portion of the City's Sphere of Influence. According to the 2000 Census, Muscoy, an approximately 2,000 acre area west of I-215 and north of SR-30, contained 2,299 units and had a population of 8,919 in the year 2000.

SCAG Projections

According to SCAG, the City can anticipate a 15 percent increase in population by the year 2025. This represents an increase of 27,003 persons in the City. The population projected within San Bernardino's existing (2005) City limit is anticipated to constitute 8.3 percent of the population within the SANBAG subregion and 22 percent of the population within the County. The City is projected to accommodate 12.2 percent of the subregion's and 30 percent of the County's employment. Finally, SCAG projects that the City will accommodate 8 percent of the subregion's and 20 percent of the County's household growth. Table 5.11-2 below provides the most current SCAG forecasts for the City, County, and SANBAG Subregion:

[1] It should be noted that this differs from SCAG's 2004 RTP Population, Housing, and Employment forecasts from SANBAG that states there were 185,772 persons in the year 2000. The Census base year figure was used in the analysis for this EIR.

Table 5.11-1
Historic Population Growth Trends in San Bernardino

Year	City Population	Growth Rate*	County Population	Growth Rate
1980	123,429	–	895,016	–
1990	164,164	33%	1,418,380	58%
1991	172,900	5%	1,464,775	3%
1992	176,400	2%	1,508,775	3%
1993	179,900	2%	1,539,800	2%
1994	180,700	0.4%	1,559,250	1%
1995	180,700	0%	1,572,650	0.9%
1996	181,400	0.3%	1,587,150	0.9%
1997	182,200	0.4%	1,605,000	1%
1998	183,600	0.7%	1,631,400	2%
1999	183,600	0.7%	1,631,400	2%
2000	185,401	13%	1,709,434	21%

Sources: 1990 & 2000 U.S. Census Bureau; California Department of Finance, Reports E-4 and E-5. *Growth rates are for the ten-year periods 1980-90 and 1990-2000.

Table 5.11-2
April 2004 RTP Population, Household, and Employment Forecasts

	2000	2005	2010	2015	2020	2025
SANBAG Subregion						
Population	1,718,311	1,919,215	2,059,420	2,229,700	2,397,709	2,558,729
Household	530,498	567,172	618,782	686,584	756,640	826,669
Employment	594,923	669,028	770,877	870,491	972,243	1,074,861
Jobs-to-household Ratio	1.12	1.18	1.25	1.27	1.28	1.30
County of San Bernardino						
Population	758,054	821,045	865,149	897,295	929,181	960,025
Household	244,476	260,357	275,352	289,318	303,596	317,831
Employment	337,247	346,770	381,680	403,000	424,470	445,193
Jobs-to-household Ratio	1.38	1.33	1.39	1.39	1.40	1.40
City of San Bernardino						
Population	185,772	199,035	207,021	208,860	210,672	212,404
Household	56,341	57,221	58,288	60,211	62,290	64,440
Employment	81,115	88,791	99,337	110,056	120,965	131,943
Jobs-to-household Ratio	1.44	1.55	1.70	1.83	1.94	2.05

Source: April 2004 RTP Population, Household, and Employment forecasts for the City of San Bernardino and SANBAG subregion.

Jobs/Household Balance

The General Plan will alter the relationship between jobs and households at the city, subregional, and county levels. Jobs/household balance is one indicator of a project's effect on growth and quality of life in the project area.

SCAG uses the jobs/household ratio to assess the relationship between housing and employment growth. The jobs/household ratio is a general measure of the "balance" between the number of jobs and number of households within a geographic area, without regard to economic constraints or individual preferences.

Jobs/household goals and ratios are advisory only. No ideal jobs/household ratio is adopted in state, regional or city policies. However, SCAG refers to communities with more than the average of 1.5 jobs per household as "jobs-rich."

As can be seen on Table 5.11-2 above, the subregion and County are projected to be slightly housing rich in 2025. On the other hand, the City of San Bernardino is projected to be jobs rich in that same time period. This difference makes sense given the concentration of employment within a City versus the spreading of employment and residential uses over the entire County and subregion. The high level of jobs-to-households reflects the fact that San Bernardino is and will continue to be a center for employment. The City currently houses an international airport that will be coming on line in the near future, two major educational institutions, and is the home of significant government offices (County of San Bernardino, County Court House, Caltrans, Federal, etc.) and regional transportation facilities (railroads, airport, and freeways). There are numerous related businesses that locate within the City to be near these uses. Build-out of the proposed General Plan accounts for these existing uses and potential businesses.

Current and Future Housing Needs

The City of San Bernardino Housing Element, adopted in July 2003 (Mayor and Common Council Resolution No. 2003-189) provides a thorough discussion as well as goals and policies to address issues of housing affordability. Government Code Section 65863 restricts cities' ability to reduce the maximum allowable density in area already designated or zoned for residential uses to a level below the density used by the State of California Housing and Community Development Department (HCD) when determining whether a city's housing element complied with state law. It is immaterial under the statute whether the reduction is initiated by a city or by a member of the public. A city may not require nor permit the reduction of density of any such residentially-designated parcel unless the city finds the proposed reduction in density is consistent with the General Plan and that the remaining sites identified in the Housing Element are adequate to accommodate the City's share of the regional housing needs.

If a city cannot make the second finding, it may still make the reduction in density if it determines there are sufficient "additional, adequate, and available" sites with equal or greater residential capacity in the jurisdiction so that there is no net loss of residential unit capacity. In some instances, it may be necessary for the city to "up-zone" some other area of the city in order to legally accomplish a down zoning (Government Code Section 65863).

In the adopted Housing Element, the City estimated that a total of 3,782 new housing units would be needed between 1998 and 2005. Of these, 1,148 units are to be affordable to very low income households, 676 to lower income households, 734 to moderate income households, and 1,223 to upper income households.

5.11.1.2 Arrowhead Springs Specific Plan

Approximately 368 acres of the Arrowhead Springs Specific Plan area are currently located in the incorporated City. The remaining 1,548 acres are located in unincorporated County of San Bernardino. There is one unit within the incorporated portion and 10 units in the unincorporated portion of the Specific Plan. Ten of these units are part of the hotel and were intended as temporary housing. A few units are used by maintenance staff as permanent housing. Currently, there are nine permanent residents that also work at Arrowhead Springs. However, for purposes of this analysis, the maximum potential population was assumed. Based on the Department of Finance, City/County Population and Housing Estimates (1/1/2004) average household size of 3.340 persons per household, there could be approximately 37 people residing within the Specific Plan area. Employment at Arrowhead Springs consists of maintenance and security staff and the offices of the American Development Group. During the business week, there are twenty employees on-site.

5.11.2 Thresholds of Significance

According to Appendix G of the CEQA Guidelines, a project would normally have a significant effect on the environment if the project would:

P-1 Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure).

P-2 Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere.

P-3 Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere.

5.11.3 Environmental Impacts

The following impact analysis addresses thresholds of significance for which the Initial Study disclosed potentially significant impacts. The applicable thresholds are identified in parentheses after the impact statement.

It is important to note the differences between build-out and the SCAG projections. General Plan build-out refers to the ultimate development in the City and, since there is no schedule for when this development will occur, is not linked to a timeline. In addition, the General Plan provides policy level guidance and does not contain specific project proposals or population controls. On the other hand, the SCAG projections are based upon annual increments. Since build-out of the General Plan is not linked to a timeframe, it is impossible to make a direct comparison with the population, housing, and employment projections provided by SCAG. It is also important to note that the SCAG 2004 RTP long-range regional growth projections consider growth within San Bernardino's existing City limits through year 2025 and estimates specific to the Sphere of Influence have not been made. However, for purposes of this CEQA analysis, the 20 year SCAG projections are used for general comparison.

It is also important to note that the build-out to the maximum levels permitted by the General Plan is not anticipated to occur in the future. This is based on the fact that the City has historically experienced development intensity that is considerably less than the maximums allowed in the General Plan. The projected build-out growth in this General Plan is based upon these historic levels of development intensity and not upon the maximums allowed in the General Plan.

5.11.3.1 San Bernardino General Plan

GP IMPACT 5.11-1: BUILD-OUT OF THE SAN BERNARDINO GENERAL PLAN WOULD ALLOW FOR SUBSTANTIAL POPULATION GROWTH THROUGH DEVELOPMENT OF ADDITIONAL HOUSING UNITS. [THRESHOLD P-1]

Impact Analysis: The San Bernardino General Plan Update plans for orderly population growth. One purpose of the General Plan is to identify the locations, densities, and standards for the desired growth of the City. Accordingly, the General Plan identifies areas for very low density (estates), low density, suburban and urban levels of density, medium and medium high density, high density residential land uses, and mixed use (residential and nonresidential). These residential uses would result in a direct population growth through build-out of the prescribed land uses. In addition, the General Plan designates commercial and industrial land uses such as office, neighborhood commercial, general commercial, regional commercial, light industrial, industrial park, or heavy industrial, which could lead, indirectly, to population growth by providing employment opportunities.

As mentioned, build-out to the maximum levels permitted by the General Plan is not anticipated to occur and was not used as a basis for build-out projections. Assuming average build-out levels that are realistic for the City of San Bernardino[2], the General Plan accommodates a total of 95,664 total units, which includes 82,714 dwelling units in the incorporated City and 12,950 dwelling units in the City's sphere of influence. Based on a factor of 3.340 persons per household[3], the projected population at build-out for the entire planning area would be approximately 319,241 people, which includes 276,264 persons in the City and 42,976 persons in the City's sphere of influence. Assuming the vacancy factor of 11.3 percent from the 2000 Census, there could be 84,854 households in the existing City limits at build-out.

Within the total planning area (incorporated plus sphere of influence), the proposed land use plan provides for a total of 3,995 acres of commercial and office uses, including 257 acres of mixed use development (accommodates a mix of commercial, office, and higher density residential development), and 6,065 acres of light and general industrial uses. At build-out using the adjusted intensity factors (FARs), the land use plan could generate approximately 355,629 jobs in the total planning area and 338,712 jobs in the existing jurisdictional boundaries.

The build-out projections for population, households, and employment for the City are all greater than those projected by SCAG to occur in the year 2025. Table 5.11-3 below summarizes the population, household, and employment projections and build-out projections for the City.

Table 5.11-3
Comparison of SCAG 2025 and General Plan Build-out Projections

	SCAG Projections for City of San Bernardino		*Proposed General Plan Build-out Projections*	
	2000	*2025*	*City Only*	*City + Sphere*
Population	185,772	212,404	276,264[2]	319,241[2]
Household	56,341	64,440	73,367[1]	84,854[1]
Employment	81,115	131,943	338,712	355,629
Jobs-to-household Ratio	1.44	2.05	4.62	4.19

Sources: April 2004 RTP Population, Household, and Employment forecasts for the City of San Bernardino and SANBAG subregion.
[1] Assuming a vacancy rate of 11.3% per the 2000 Census
[2] Department of Finance (1/1/04), which utilized 3.340 persons per unit

In order to make a comparison of General Plan build-out to existing employment conditions, the 2000 employment figures from SCAG were used. As can be seen in Table 5.11-3 above, the number of jobs projected at build-out of the General Plan is significantly higher at build-out than was assumed by SCAG in the year 2000. Part of this can be attributed to the closure of Norton Air Force Base closed in 1994 and the resultant loss of thousands of jobs. The build-out of the General Plan assumes reuse of the airport. As can also be seen in Table 5.11-3 above, the jobs-to-household ratio is substantially higher at build-out than is projected by SCAG to occur in the year 2025. Again, this is not a direct comparison as build-out is not linked to a timeline but represents ultimate development of the City. By achieving a very jobs-rich 4.19 jobs/household ratio, the proposed General Plan benefits the overall County and subregional jobs/housing

[2] The build-out assumptions in the General Plan are not based upon the maximum density and intensity levels for each land use category, but on typical development levels found in the City. This accounts for variations in project design, site conditions, open spaces, and access and parking requirements. Dwelling unit projections were estimated at 85 percent of the maximum density for each land use designation. Building square footage for the non-residential land use designations were calculated at 60 percent for commercial land uses and 70 percent for industrial land uses of the maximum FAR. These adjustments account for the fact that build-out, on average, typically occurs at less than the maximum density.

[3] Department of Finance, City/County Population and Housing Estimates (1/1/2004).

balance. This reflects the desire to continue to be a center of employment and build upon the existing concentration of government offices, higher educational institutions, and improve the airport and surrounding area. Given that employees will not necessarily live and work within the same City, the concentration of jobs in the City will help more workers in the area live and work within the County and subregion, which will help address the slight imbalance at the county and subregional levels.

When compared to the proportion of population and households at the County and Subregional levels in 2025, the City build-out levels are slightly higher, as shown on Table 5.11-4. Given that build-out of the City is not limited to 2025, this proportional increase is generally consistent with SCAG's projections. However, the proportion of jobs-to-households projected at build-out of the City is significantly greater than those projected by SCAG to occur in 2025. These jobs will help the County and Subregion address the slight imbalance in the future.

Table 5.11-4
Comparison of SCAG 2025 and City Build-out Proportions

	SCAG 2025 Projections		City Build-out Projections (2005 City Boundaries)	
	City as % of SANBAG Subregion	City as % of County	City as % of SANBAG Subregion	City as % of County
Population	8.3%	22%	12%	33%
Households	8%	20%	10%	27%
Employment	12%	30%	33%	80%

It should also be noted that while statistically the employment figures for build-out of the General Plan indicate that this large portion of jobs can be accommodated, it is not realistic to assume that they will actually occur. However, given the types of employment resources existing and expected to continue to exist in the City, it can be anticipated that the City will be jobs rich in the future.

Build-out in accordance with the City of San Bernardino General Plan would accommodate substantial growth when compared to SCAG's 2025 population, household, and employment projections. As can be seen on Table 5.11-4, the build-out projections for population, households, and employment are all greater than projected by SCAG to occur in 2025. Since build-out of the General Plan is not linked to a timeframe, it is impossible to make a direct comparison with the 2025 SCAG projections. However, as seen on Table 5.115.114, the proportion of population and households at build-out of the City is generally consistent with SCAG's projections at the County and Subregional levels and the General Plan provides some additional capacity for to accommodate growth beyond the year 2025.

SCAG projects the City to be jobs-rich in 2025; however, the build-out projections for the City indicate a much greater proportion of employment and a much greater level of jobs-to-households. Considering it is not a direct comparison, the build-out of the City provides additional capacity beyond the year 2025 to accommodate additional employment. This will help the County and SANBAG Subregion address the projected regional jobs deficiency. This will allow a greater number of residents in the region to live and work in the City and surrounding areas.

GP IMPACT 5.11-2: ***BUILD-OUT OF THE SAN BERNARDINO GENERAL PLAN WOULD RESULT IN DISPLACING PEOPLE AND/OR HOUSING NECESSITATING THE CONSTRUCTION OF REPLACEMENT HOUSING ELSEWHERE. [THRESHOLDS P-2 AND P-3]***

Impact Analysis: The General Plan Land Use Element identifies two specific areas of the City where the proposed land use designations are changed from residential to non-residential and would result in the displacement of people and housing. In the first area, a 13.1 acre area west of I-215 is currently developed with and designated for residential uses (RS). In the proposed General Plan, this area is proposed to be changed to job producing industrial uses (IL). In the second area, within the Eastern Recreation Village Strategic Area, the proposed General Plan reflects an ongoing redevelopment project and non-residential land use designation. The Arden-Guthrie area is currently designated as Public Commercial Recreation (PCR) in the existing General Plan and Zoning Ordinance and is part of an existing redevelopment program to remove units, relocate tenants, and develop commercial and commercially oriented recreational uses.

While no quantitative studies have been performed, the proposed General Plan continues existing General Plan and Zoning designations that identify areas for non-residential uses where some existing and scattered residential uses currently exist. For instance, within the existing industrial designations near Tippecanoe, there are some scattered legal non-conforming residential uses. Likewise, there are a few legal non-conforming residences in commercial designated or industrial designated areas in other areas of the City, such as along commercial corridors.

The General Plan and Zoning Code assume that these existing legal non-conforming uses will remain until changes occur through voluntary means or through redevelopment efforts. In the meantime, improvements and alterations to these uses are addressed in Section 19.62, *Non-Conforming Structures and Uses*, of the City's Development Code.

The proposed General Plan Update provides for additional residential opportunities in areas that currently do not allow residential uses. Through the Corridor Improvement Program, the General Plan allows the infusion of residential uses to reduce the length of strip commercial and concentrate commercial uses at major intersections. As a result, the General Plan will not result in the displacement of a substantial number of people or existing homes.

Relevant General Plan Policies and Programs

The purpose of a general plan is to plan for and accommodate increases in population, housing and employment. The goals and policies of a general plan are intended to reduce the impacts of this growth and accommodate balanced and manage growth with adequate housing, infrastructure, services, and systems. The General Plan provides the benchmark for which to plan for infrastructure and services; however, the circulation and infrastructure systems, recreational facilities and programs, and safety and civic services will be required to accommodate the increase in population, housing, and employment as necessitated by the level of growth at the time it occurs. For instance, as described in the Circulation Element, the planned roadway systems have been sized and located to accommodate the anticipated levels of population and employment at build-out of the Land Use Plan. As individual projects occur, the street system will be developed according to the contribution of each project.

In addition to the General Plan Land Use designations, the following are examples of relevant policies in the proposed General Plan Update that balance population/housing growth with the provision of adequate services and infrastructure:

Land Use Element

Policy 2.1.1: Actively enforce development standards, design guidelines, and policies to preserve and enhance the character of San Bernardino's neighborhoods. (LU-1)

Policy 2.2.1: Ensure compatibility between land uses and quality design through adherence to the standards and regulations in the Development Code and policies and guidelines in the Community Design Element.

Policy 2.4.1: Quality infill development shall be accorded a high priority in the commitment of City resources and available funding.

Policy 2.4.2: Continue to provide special incentives and improvement programs to revitalize deteriorated housing stock, residential neighborhoods, major business corridors, and employment centers.

Policy 2.4.3: Where necessary to stimulate the desired mix and intensity of development, land use flexibility and customized site development standards shall be achieved through various master-planning devices such as specific plans, planned development zoning, and creative site planning.

Policy 2.6.2: Balance the preservation of plant and wildlife habitats with the need for new development through site plan review and enforcement of the California Environmental Quality Act (CEQA).

Policy 2.7.5: Require that development be contingent upon the ability of public infrastructure to provide sufficient capacity to accommodate its demands and mitigate its impacts.

The projected build-out population, housing, and employment growth would occur throughout the City as described on the Land Use Map. Since most of the City is already developed, the projected growth would occur in scattered undeveloped or underutilized properties throughout the City and its Sphere of Influence. The following General Plan policies emphasize infill development and revitalization of underutilized parcels within the City, ensuring quality development, and the enhancement/preservation of neighborhood character and resources:

Housing Element

Policy 3.1.1: Accommodate the production of new housing units on currently vacant or underutilized land at densities and standards designated in the Land Use Element of the General Plan.

Policy 3.1.4: Accommodate residential development in areas of the Central City designated for mixed commercial and residential use in accordance with policies in the Land Use Element.

Policy 3.3.1: In compliance with state law (Government Code Section 65915), provide density bonuses and/or regulatory and financial incentives to developers who propose to include a specified percentage of very low-income, low-income, and/or senior housing in new development projects or as part of the conversion of rental apartments to condominiums.

Community Design Element

Policy 5.3.6: Provide for streetscape improvements, landscape and/or signage that uniquely identify architecturally or historically significant residential neighborhoods. (CD-3)

Policy 5.5.1: Require new and in-fill development to be of compatible scale and massing as existing development yet allow the flexibility to accommodate unique architecture, colors, and materials in individual projects.

Programs

- Corridor Improvement Program, which is an optional package of policy, regulatory, and incentive programs that, if applied, are intended to stimulate private investment and result in desired development within the Corridor Strategic Areas. This is accomplished by providing optional incentives, in the form of density bonuses and varied development standards, to developments that qualify.

- Promote downtown revitalization by seeking and facilitating mixed-use projects (e.g., combinations of residential, commercial, and office uses).

- Accommodate residential units above the first floor of commercial structures provided that: a) The impacts of noise, odor, and other characteristics of commercial activity can be adequately mitigated; and b) A healthy, safe, and well-designed living environment with a complement of amenities can be achieved for the residential units.

As indicated by the above policies, the General Plan encourages infill and revitalization of both vacant and underutilized sites. Infill development on vacant sites would not displace residents and/or businesses; however, revitalization of underutilized sites could displace residents and businesses over time. Nevertheless, the displacement impact would not be significant because it would provide for new housing at these locations, together with complementary commercial uses. In other portions of the Planning Area, the General Plan proposes a mix of residential and non-residential uses on sites currently underutilized with exclusively non-residential uses.

5.11.3.2 Arrowhead Springs Specific Plan

AHS IMPACT 5.11-1: BUILD-OUT OF THE ARROWHEAD SPRINGS SPECIFIC PLAN WOULD RESULT IN SUBSTANTIAL POPULATION GROWTH THOUGH THE CONSTRUCTION OF ADDITIONAL HOUSING UNITS. [THRESHOLD P-1]

Impact Analysis: The Arrowhead Springs Specific Plan addresses the orderly population growth within 1,916 acres partially within and outside of the City's jurisdictional boundaries. The Specific Plan identifies areas for low density, medium density, and mixed use (residential and nonresidential). These residential uses would result in a direct population growth through build-out of the prescribed land uses. In addition, the Specific Plan designates commercial uses that allow hotel, entertainment, office, health clubs, restaurants, and a golf course, which could lead, indirectly, to population growth by providing employment opportunities.

At build-out, the Arrowhead Springs Specific Plan could accommodate 1,350 residential units. Based on a factor of 3.340 persons per household and an adjustment for senior units[4], the projected population at build-out for the Specific Plan would be approximately 4,233 people. This would account for 1.3 percent of the population and 1.4 percent of the housing units at build-out of the City's total planning area. While there is no standard for comparison, the proportions of population and housing resulting from build-out of Arrowhead Springs are not in themselves significant.

Arrowhead Springs provides new housing opportunities and a range of housing products that do not currently exist and can accommodate workers. The 1,350 new residential units would provide housing opportunities for multiple segments of the housing market, from executive homes to multi-family units. Arrowhead Springs accommodates 36 custom estates, 34 "urban" flats in Village Walk, 266 condominiums and townhomes adjacent to Village Walk, 150 upscale senior units, 150 non-age restricted attached units, 429 golf course condominiums, and 285 townhomes and condominiums.

[4] In the Senior Village (RM-SV), it is assumed that 150 units will be restricted to seniors (1.5 persons per unit) and 150 units will not be age restricted (3.340 persons per unit)

This mixture is vastly different that what exists in the City. The 2000 Decennial Census found that the housing stock in the City was 58.8 percent single-family, 4.3 percent single-family attached, 29.8 percent multi-family, 6.9 percent mobile homes, and 0.2 percent other types of units (boats, recreational vehicles, vans, etc). On the other hand, single-family homes in Arrowhead Springs account for 2.7 percent of the total units while multi-family units account for 97.3 percent of the units. The multi-family units typically provide a more affordable housing option that can be used by on-site workers and residents of San Bernardino.

The Specific Plan also accommodates the development of 1,044,646 square feet of non-residential uses, which includes 235,996 square feet of existing and 808,650 square feet of new commercial uses. At build-out, the land use plan for the total planning area could generate approximately 2,530 jobs. Based upon the 2000 Census, the City of San Bernardino has an 11.3 percent housing vacancy rate. However, due to the unique nature and mixture of product in Arrowhead Springs, a 5 percent vacancy rate has been assumed for the Specific Plan. Given the 5 percent vacancy rate, Arrowhead Springs may realize 1,283 households.

At build-out, Arrowhead Springs would have a jobs-to-household factor of 1.97. This reflects the concentration of employment in the specific plan for the hotel, health club and spa, and commercial uses. As shown on Table 5.11-3 above, SCAG projections indicate that the City as a whole will be jobs-rich in 2025 (2.05 jobs-to-household ratio) and the build-out projections for the proposed General Plan show a greater level of jobs-to-households (4.67 jobs-to-household ratio). Since, the Specific Plan improves the overall jobs-to-households imbalance at the City level and helps reduce the region-wide households to jobs imbalance, no significant impacts are anticipated.

The recent court decision in Napa Citizens for Honest Government v. Napa County Board of Supervisors, 91 Cal. App. 4th 342 (2001), confirms the importance of addressing jobs/housing location relationships as part of the environmental review process. The proposed project addresses both housing needs of proposed workers and the City's ability to provide for their housing needs. Arrowhead Springs would locate homes near job opportunities, thus addressing local and regional policies aimed at matching housing and job opportunities and reducing vehicle trips and associated congestion/emissions.

AHS IMPACT 5.11-2: BUILD-OUT OF THE ARROWHEAD SPRINGS SPECIFIC PLAN WOULD DISPLACE 11 HOUSING UNITS (THRESHOLDS P-2 AND P-3)

Impact Analysis: There are 11 units existing within the Specific Plan. Ten of these units are part of the hotel and were intended as temporary housing. Currently, however, there are nine permanent residents and their families using a few of these units, all of whom work on-site. Assuming a worst-case scenario, there could be approximately 37 people residing within the Specific Plan area that could be displaced.

However, the Arrowhead Springs Specific Plan could accommodate 1,350 new residential units, approximately 4,233 people, and approximately 2,530 jobs. Arrowhead Springs provides new housing opportunities and a range of housing products that do not currently exist in the City and could accommodate the population displaced. The housing mixture at Arrowhead Springs is 2.7 percent single-family and 97.3 percent multi-family units. Due to the high percentage of multi-family units, Arrowhead Springs is consistent with the City Housing Element's ongoing effort to boost housing production to meet its fair share of regional housing needs, as required by state law.

5.11.4 Existing Regulations and Standard Conditions

5.11.4.1 San Bernardino General Plan

- The City shall maintain its Housing Element in compliance with relevant State Law.

5.11.4.2 Arrowhead Springs

There are no existing regulations or standard conditions relating to population and housing.

5.11.5 Level of Significance before Mitigation

5.11.5.1 San Bernardino General Plan

Without mitigation the following impacts would be less than significant:

GP Impact 5.11-1: SCAG projects the City to be jobs-rich in 2025; however, the build-out projections for the City indicate a much greater proportion of employment and a much greater level of jobs-to-households. Considering it is not a direct comparison, the build-out of the City provides additional capacity beyond the year 2025 to accommodate additional employment. This will help the County and SANBAG Subregion address the projected regional jobs deficiency. This will allow a greater number of residents in the region to live and work in the City and surrounding areas, and improve the jobs/housing balance of the SANBAG Subregion consistent with the goals and policies contained in SCAG's Regional Comprehensive Plan & Guide. Therefore, potential population and housing impacts are considered substantial, but not adverse.

GP Impact 5.11-2: Less than significant. Although the General Plan Update redesignates some residential land for non-residential uses, the lost units can be accommodated in other areas of the City. The proposed General Plan Update provides for additional residential opportunities in areas that currently do not allow residential uses. Through the Corridor Improvement Program, the General Plan allows the infusion of residential uses to reduce the length of strip commercial and concentrate commercial uses at major intersections. As a result, the General Plan will not result in the displacement of a substantial number of people or existing homes.

5.11.5.2 Arrowhead Springs Specific Plan

Without mitigation the following impacts would be less than significant:

AHS Impact 5.11-1 Since the Specific Plan improves the overall jobs-to-households imbalance at the City level and helps reduce the region-wide households to jobs imbalance, no significant impacts are anticipated.

AHS Impact 5.11-2 As mentioned above, the Arrowhead Springs Specific Plan could accommodate 1,350 new residential units, approximately 4,233 people, and approximately 2,530 jobs. Arrowhead Springs provides new housing opportunities and a range of housing products that do not currently exist in the City. As a result, the loss of 11 units is not considered significant.

5.11.6 Mitigation Measures

5.11.6.1 San Bernardino General Plan

No significant impacts were identified and no mitigation measures are necessary.

5.11.6.2 Arrowhead Springs Specific Plan

No significant impacts were identified and no mitigation measures are necessary.

5.11.7 Level of Significance after Mitigation

No mitigation measures are necessary.

5.12 PUBLIC SERVICES

This section addresses public services including: Fire Protection and Emergency Services, Police Protection, School Services, and Library Services. Park Services are addressed in Section 5.14, Recreation. Public and private utilities and service systems, including water, wastewater, and solid waste services and systems; are addressed in Section 5.15. Information was provided by service questionnaires (found in Appendix E, Volume II) and the following technical document:

- *Arrowhead Springs Annexation Study: Plan for Service, City of San Bernardino*, Stanley R. Hoffman Associates, June 8, 2005.

5.12.1 Fire Protection and Emergency Services

5.12.1.1 Environmental Setting

San Bernardino

The City of San Bernardino is serviced by San Bernardino City Fire Department SBCFD). The San Bernardino City Fire Department serves a resident population of over 180,300 and covers a diverse service area of 60 square miles. In the service area there are approximately 19 miles of wildland interface area, a major rail yard, an international airport, the County Seat, a correctional facility, two major mall complexes, and two major interstate freeways.

Water Pressure System

The water pressure system that supplies emergency water for fire services is comprised of three separate, interconnected systems: a lower, an intermediate, and an upper system. These are a combination of gravity and booster pump systems that transport water up elevation differences in order to maintain adequate water pressure. Water is obtained from 35 wells using 35 turbine pumps and released into the system using 44 booster pumps and 422 miles of water mains. Twenty one strategically placed reservoirs, having a total water storage of about 75 million gallons, are in use and there is a total production capability of about 71 million gallons per day. The San Bernardino City Fire Department presently has in excess of 3,000 fire hydrants in the City.

Facilities and Staffing

The San Bernardino City Fire Department staffs twelve fire engine companies and two aerial truck companies housed in twelve stations in the City. Table 5.12-1 lists fire stations that serve the City and contract areas. In addition to stations within the City's fire department, all fire departments in the State are signatory to a master mutual aid agreement. This agreement was established to provide assistance for major incidents. The agreement states in part that "political subdivisions will reasonably exhaust local resources before calling for outside assistance." In addition to a master mutual aid agreement, the City of San Bernardino Fire Department has a joint response agreements between the neighboring cities of Rialto, Colton, and Loma Linda, where units in the these cities respond in the event of a multi-unit fire.[1] Stations that would respond in the case of a major incident are also listed in Table 5.12-1. The Fire Department also contracts with the County of San Bernardino to provide service for portions of the County.

[1] Phone conversation with Chief Allan Simpson, SBFD. February, 2004

Table 5.12-1
San Bernardino City Fire Department Fire Stations

Station	Location	Equipment	Personnel
Fire Station #221	200 E. 3rd Street	Medic Engine Aerial Ladder Truck Battalion Command Vehicle Air/Light Truck	3 4 1 (staff as needed)
Fire Station #222	1201 W. 9th Street	Medic Engine	4
Fire Station #223	2121 N. Medical Center Dr.	Medic Engine Brush Engine	4 (staff as needed)
Fire Station #224	2641 N. "E" Street	Medic Engine Aerial Ladder Truck Battalion Command Vehicle	3 4 1
Fire Station #225	1640 W. Kendall Drive	Medic Engine Brush Engine	3 (staff as needed)
Fire Station #226	1920 N. Del Rosa Avenue	Medic Engine	4
Fire Station #227	282 W. 40th Street	Medic Engine	4
Fire Station #228	3398 E. Highland Avenue	Medic Engine Brush Engine	3 (staff as needed)
Fire Station #229	202 N. Meridian Avenue	Medic Engine	3
Fire Station #230	502 S. Arrowhead Avenue	Medic Engine Brush Engine Heavy Rescue Unit	4 (staff as needed) (staff as needed)
Fire Station #231	450 Vanderbilt Way	Medic Engine HazMat Unit	3 (staff as needed)
Fire Station #232	6053 North Palm Avenue	Medic Engine Brush Engine	4 (staff as needed)
Fire Station #233	165 Lealand Norton Way SBD Airport	2 each: • 1500 Gallon ARFF Units • Quick Attack Unit	 (staff as needed) (staff as needed)
Additional Units provided by Mutual Aid Agreement			
San Manuel FS #241	26540 Indian Service Road	Medic Engine Medic Quint Battalion Command Unit	4 4 1
USDA FS #36	2586 Hillview Road	Brush Engine	5 seasonal
County FS #75	2156 W. Darby Street (Muscoy)	Engine	3
County FS #2	1511 Devore Road (Devore)	Engine	3

Notes:
Medic Engines are staffed with one Captain, Engineers, Paramedic Firefighter and, in some cases, an additional Firefighter.
Ladder Trucks are staffed with on Captain, Engineer, and 2 Firefighters.
Battalion Command Vehicles are staffed with on Battalion Chief.
Other assigned apparatus are staffed by on duty personnel on an as needed basis.
List does not include 5 reserve engines and 1 reserve truck.
Source: San Bernardino City Fire Department, 2004.

The current "On-Duty" strength per shift, total number of personnel available to respond to emergencies including two battalion Chief Officers, for the San Bernardino City Fire Department is 51, divided among the twelve stations. The department also currently has all personnel trained to the level of Emergency Medical Technician at a minimum. The department also staffs a minimum of one Advanced Life Support paramedic on each engine company. Fire related emergencies are answered by a minimum of four firefighters. Structural fires are answered by a minimum of 17 firefighters. The average work week is a 56-hour week.

Response time for a unit varies and depends on the location of the response site; however, the City's adopted response time standard is five minutes or less 90 percent of the emergency calls for service. This time is measured from when the responding unit goes en route to the call, to when it arrives on the scene of an emergency. From within the planning area, if an engine is at the closest fire station (station 227 located at 282 West 40th Street), the response time would be 8 to 12 minutes for a unit to respond from the closest fire station. With the exception of Fire Station #233, all fire stations are manned continuously. The San Bernardino International Airport Fire Station #233, consists of active personnel at designated times during the week. The station is equipped to respond to calls at the airport or to provide special services when needed by full-time personnel from other stations during off hours.

In addition, the City Council has approved a plan to relocate four of the existing fire stations within the City Limits so that fire responses by units can achieve the adopted level of five minutes or less 90 percent of the time. This project will occur as funding is identified and allocated by the Mayor and Common Council.

Services

Besides fire protection services, the San Bernardino City Fire Department also provides Fire/Arson Investigation Unit, Hazardous Materials Team and Disaster Preparedness Services. The Investigations Unit has 10 personnel staff consisting of a Senior Investigator and nine other personnel certified as Investigators. The unit is assigned to Fire Station #222 and all of its members hold Peace Officer status. Members of this unit participate on a volunteer basis with 100 hours of on-scene training. The Hazardous Materials Response Team handles hazardous materials leakage, emissions, discharge, dumps, spills, etc., within the planning area boundaries. Station #231 is designated to answer calls associated with handling of hazardous materials. The Disaster Preparedness Office, created by the City's Municipal Code, Chapter 2.46, is a division of the Fire Department. Under the direction of the Fire Chief, a major activity of the Disaster Preparedness Office is the development and approval of integrated emergency response plans for the City of San Bernardino.

Hazardous Fire Areas

San Bernardino City Fire Department is a member of the Inland Empire Fuels and Management Alliance. This is nine-member alliance developed to identify specific projects pertaining to vegetation management and wild land fuel reduction within San Bernardino and Riverside Counties. Each member participates in such projects as to prevent and minimize fire threats in and around their respective communities

As the foothill areas adjacent to the San Bernardino Mountains are considered hazardous fire areas, the City of San Bernardino has created a Foothill Fire Zone Overlay District. Within this District, the City identifies three foothill fire zones that have different degrees of hazard based on slope, type of fuel present, and natural barriers. The foothill fire zones are: A–Extreme Hazard, B–High Hazard, and C–Moderate Hazard. Fire Zone A includes areas with slopes of 30 percent or greater, Fire Zone B includes area with slopes between 15 to 30 percent and, Fire Zone C includes those areas with slopes of 0 to 15 percent.

Insurance Classification

The Insurance Service Office (ISO) Grading Schedule is a means of classifying cities with reference to their fire defenses and physical conditions. The insurance classification developed under this schedule is only one of several elements used in development of fire insurance rates. The ISO rating for the planning area is Class 3. The ISO rating is on a scale from 1 to 10, with Class 1 being the best. In most insurance rates, the fire insurance costs are the same for single-family residential structures in the 2–4 rating. Commercial, industrial, and multiple residential insurance costs can be substantially affected by ISO ratings.

Arrowhead Springs

Only a portion of the Arrowhead Springs Specific Plan area is located within the City limits of San Bernardino. While the southwestern tip of the Arrowhead Springs Specific Plan area is currently serviced by the San Bernardino City Fire Department, details of which are described above, the majority of the existing developed area currently lies outside the service boundary for the Fire Department. These areas of the Arrowhead Springs Specific Plan, designated as Community Service Area (CSA) 38, are serviced by the San Bernardino County Fire Department. Because the closest San Bernardino City Fire department resources are located significantly farther away than the closest County Fire Department resources, the County Fire Department and the San Bernardino City Fire Department have established an automatic aid agreement for this area. The agreement calls for the San Bernardino City Fire Department to be the first responding agency to these areas. The Count Fire Department will then send additional units to the area, and take over the operations when they arrive. In addition, the Arrowhead Springs Specific Plan area is considered a hazardous fire area, evidenced by the 2002 fire which affected a large portion of the planning area.

Upon implementation of the Arrowhead Springs Specific Plan, the Arrowhead Springs area would be incorporated into the City in its entirety and the Foothill Fire Zone Overlay District would be amended to include the area. Upon annexation, the City's Fire Department would provide fire services to the Arrowhead Springs area. The closest existing fire station to the Arrowhead Springs Specific Plan area is Fire Station #227, located 3.4 miles from the Arrowhead Springs area.

5.12.1.2 Thresholds of Significance

According to Appendix G of the CEQA Guidelines, a project would normally have a significant effect on the environment if the project would:

FP-1 Result in a substantial adverse physical impact associated with the provisions of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for fire protection services.

5.12.1.3 Environmental Impacts

San Bernardino General Plan

The following impact analysis addresses thresholds of significance for which the Initial Study disclosed potentially significant impacts. The applicable thresholds are identified in parentheses after the impact statement.

GP IMPACT 5.12-1: BUILD-OUT OF THE SAN BERNARDINO GENERAL PLAN WOULD INTRODUCE NEW STRUCTURES, RESIDENTS, AND WORKERS WITHIN THE CITY OF SAN BERNARDINO FIRE DEPARTMENT SERVICE BOUNDARIES, THEREBY INCREASING THE REQUIREMENT FOR FIRE PROTECTION FACILITIES AND PERSONNEL. [THRESHOLD FP-1]

Impact Analysis: Build-out of the San Bernardino General Plan would result in an increase in residents and workers in the City and Sphere of Influence (SOI) areas, which may result in an increased demand for fire protection services, resulting in the need for additional fire protection facilities and personnel. According to the San Bernardino Fire Department, the current fire service system is stressed due to a high number of emergency responses in the County Contract areas and, if appropriate action is not taken, city residents will experience a reduced level of service within the City Limits for a much greater cost than those individuals receiving service in the County Contract areas. If additional fire and emergency medical services facilities

and personnel are not added to accommodate the increase service demand brought about by the development of the project area, a similar pattern of overstressed resources and decreased levels of service to the overall community would evolve.

General Plan Relevant Policies and Programs

The following City of San Bernardino General Plan policies and programs related to fire protection include:

Public Facilities and Services Element

Policy 7.2.1: Assure that adequate facilities and fire service personnel are maintained by periodically evaluating population growth, response time, and fire hazards in the City.

Policy 7.2.2: Assess the effects of increases in development density and related traffic congestion on the provision of adequate facilities and services ensuring that new development will maintain fire protection services of acceptable levels.

Policy 7.2.3: Establish a program whereby new development projects are assessed a pro rata fee to pay for additional fire service protection to that development.

Policy 7.2.4: Coordinate inter-agency fire service protection agreements with County U.S. Forest Service, and other fire protection agencies.

Policy 7.2.5: Maintain an "ISO" fire rating of at least Class 3.

Policy 7.2.6: Require that all buildings subject to City jurisdiction adhere to fire safety codes.

Policy 7.2.7: Develop and implement a comprehensive high-rise fire safety program.

Policy 7.2.8: Promote public education regarding fire safety to address issues such as storage of flammable material and other fire hazards.

Policy 7.2.9: Continue uniform reporting of all fire emergency data including type and cause of fire alarm response time and damage/injury data.

Safety Element

Policy 10.11.1: Continue to conduct long-range fire safety planning efforts to minimize urban and wildland fires, including enforcement of stringent building, fire, subdivision and other Municipal Code standards, improved infrastructure, and mutual aid agreements with other public agencies and the private sector.

Policy 10.11.2: Work with the U.S. Forest Service and private landowners to ensure that buildings are constructed, sites are developed, and vegetation and natural areas are managed to minimize wildfire risks in the foothill areas of the City.

Policy 10.11.3: Require that development in the High Fire Hazard Area, as designated on the Fire Hazards Areas Map (Figure S-8) be subject to the provisions of the Hillside Management Overlay District (HMOD) and the Foothill Fire Zones Overlay.

Policy 10.11.4: Study the potential acquisition of private lands for establishment of greenbelt buffers adjacent to existing development, where such buffers cannot be created by new subdivision.

Policy 10.11.5: Continue to require that all new construction and the replacement of 50 percent or greater of the roofs of existing structures use fire retardant materials.

Arrowhead Springs Specific Plan

AHS IMPACT 5.12-1: ***INCORPORATION OF THE ARROWHEAD SPRINGS SPECIFIC PLAN AREA AND SUBSEQUENT DEVELOPMENT WOULD INTRODUCE NEW STRUCTURES, RESIDENTS, AND WORKERS WITHIN THE CITY OF SAN BERNARDINO FIRE DEPARTMENT SERVICE BOUNDARIES, THEREBY INCREASING THE REQUIREMENT FOR FIRE PROTECTION FACILITIES AND PERSONNEL. [THRESHOLD FP-1]***

Impact Analysis: Currently the Arrowhead Springs Specific Plan area is within the service boundary of the San Bernardino County Fire Department, CSA 38. With incorporation of this area into the City limits, protection of the Arrowhead Springs Specific Plan area would be transferred to the jurisdiction of the San Bernardino City Fire Department. Although there is a mutual fire aid agreement between these two agencies, currently the San Bernardino City Fire Department has not determined future fire services demand, however an increase in services in the fire prone Arrowhead Springs planning area is likely. Furthermore, the closest station to the Arrowhead Springs Area is located 3.4 miles away. At this distance the Department's response time to the Arrowhead Springs Specific Plan area would be 8 to 12 minutes, which exceeds the San Bernardino City Fire Department desired response time of 5 minutes on 90 percent of all emergency calls for service. In addition, the San Bernardino City Fire Department has determined that a high number of emergency responses in County contract areas could result in reduced level of service within the City limits. Build-out of the Arrowhead Springs Specific Plan area would therefore increase the need for fire protection facilities and personnel to cover the Specific Plan area.

5.12.1.4 Existing Regulations and Standard Conditions

Existing regulations and standard conditions apply to both the San Bernardino General Plan Update and the Arrowhead Springs Specific Plan.

- Fire Zones A and B within the Foothill Fire Zone Overlay District shall be determined by the slope analysis, submitted with the project application if located in the Foothills Fire Zone Overlay District. (Section 19.15.020 of the City of San Bernardino Municipal Code)

- A fee will be charged for permits, plan checks and/or inspections for construction or work which requires Fire Department approval. The amount of the fee shall be based on the City of San Bernardino Fire Department Schedule of Fees for Residential and Commercial Construction. (Section 15.16.070 of the City of San Bernardino Municipal Code)

- A fee will be charged for all permits required in Section 105.8 of the California Fire Code. Charges shall be established by Resolution of the Mayor and Common Council. FINDINGS: A, B, C, D, E, and F (Ord. MC-1048, 5-17-99; Ord. MC-984; 11-4-96). (Section 15.16.090 of the City of San Bernardino Municipal Code)

- All newly constructed buildings, structures, or appurtenances outside the Foothill Fire Zones are subject to the Building Safety Enhancement Area Building Standards. (Section 15.11.040 of the City of San Bernardino Municipal Code)

5.12.1.5 Level of Significance Before Mitigation

General Plan Update

Upon implementation of relevant General Plan policies and programs, regulatory requirements and standard conditions of approval, the impact to fire services would be less than significant.

GP Impact 5.12.-1 Build-out of the San Bernardino General Plan would result in an increased demand for fire protection services, resulting in the need for addition fire protection facilities and personnel in a stressed service system area. The City may request funding and or provision of facilities from individual new developments to provide fire protection services if needed for that development however the City's revenue sources and budgetary process would assure that sufficient funding is available when necessary to provide the appropriate fire services and facilities as growth occurs.

Arrowhead Springs

Without mitigation, the Arrowhead Springs Specific Plan project-related impacts to fire protection and emergency services would be **significant**.

AHS Impact 5.12-1 Incorporation and build-out of the Arrowhead Springs Specific Plan area would expand the service boundary for the San Bernardino City Fire Department in an area that has a high number of emergency response calls and high fire danger thereby reducing the level of service for the remainder of the City and resulting in an increased need for addition fire protection facilities and personnel.

5.12.1.6 Mitigation Measures

San Bernardino General Plan

No significant impacts were identified for the General Plan Update and no mitigation measures are required.

Arrowhead Springs Specific Plan

AHS 5.12-1 Prior to approval of any tract map or development application, the project applicant shall enter into a secured fire protection agreement with the City of San Bernardino to provide necessary fire fighting facilities, personnel, equipment for fire, and emergency services delivery, either through construction of fire facilities, funding or a combination of both. The Agreement shall also address the phasing of required fire facilities.

5.12.1.7 Level of Significance After Mitigation

The mitigation measures identified above would reduce potential impacts associated with fire protection and emergency services to a level that is less than significant. Therefore, no significant unavoidable adverse impacts relating to fire protection and emergency services have been identified.

5.12.2 Police Protection

5.12.2.1 Environmental Setting

San Bernardino

Law enforcement and crime prevention services are provided by the San Bernardino Police Department. Police services provided include patrol, investigations, traffic enforcement, School Resource Officer, forensics, and community service offices. The San Bernardino Police Department is authorized to employ approximately 312 sworn officers, and a support staff of approximately 159, including about 150 police officers assigned to the Patrol Division, and approximately 10 volunteers. Currently the San Bernardino Police Department employs one police chief, one assistant police chief, three captains, 11 lieutenants, 42 sergeants, 46 detectives, 197 police officers, 20 community service officers I, and 20 community service officers II.

The San Bernardino City Police Department consists of three divisions: Patrol, Investigations, and Services. Each division includes specialized unit (s) comprised of a variety of trained personnel and services.

Patrol Division

The Patrol Division is the largest division in the department, and under the command of the Patrol Division Commander Captain, coordinates operations of the District Command offices, Watch Commander's Office, Front Desk, and Traffic Bureau. Patrol officers operate daily from the Main Police Headquarters, assigned to four operational shifts coordinated through the Watch Commander. The Main Police Headquarters patrol an area of about 60 square miles, which includes a mix of industrial, commercial, planned unit developments, high-density and rural, unimproved, land. The Patrol Division is divided into five geographic District Command community based offices, located as follows:

- Western District Office: located at 1574 West Baseline Street, Suite 103;
- Northern District Office: located at 941 Kendall Drive;
- Eastern District Office: located at 1535 E. Highland Avenue, Suite C;
- Central District Office: located at 334 West Baseline Street; and
- Southern District Office: located at 204 Inland Center Mall.

Each District Command office is lead by a lieutenant district commander and staffed with an operations sergeant, one problem solving officer, one investigative liaison office, one Patrol Coordinator officer, one crime prevention specialist and one police service assistant. Each District Command office is divided into smaller beats, which have a patrol officers assigned 24-hours a day, seven days a week. Ultimately the Patrol Division, under the District Commands, will field 21 beats on shifts 1, 3, and 4. These officers are responsible for identifying and responding to beat crime patterns. The District Command Boundaries and beats are established by a variety of factors, including, but not limited to; call for service volume, type of call, man-hours spent per call, political boundaries, community group locations, and geographic landmarks to establish a City wide balance of service. As crime and calls for service change over time, the District beat boundaries and staffing assignments are evaluated to maintain a balance of service across the City. Staffing for the department is not based on a particular ratio of "officer per thousand" but is determined to provide the ability to conduct proactive community oriented policing and problem solving.

Investigations Division

The Investigations Division is under the command of the Investigations Division Captain and consists of five units: Specialized Crimes, Special Enforcement Bureau, District Crimes, Identification Bureau/Property Unit, and Crime Analysis.

- The Specialized Crimes Unit investigates rapes, sexual batteries, domestic violence, crimes against children, missing persons, abductions (parental and stranger), fraud, forgery, felony and/or misdemeanor weapons offenses, and crimes against persons.
- The Special Enforcement Bureau consists of the Homicide Unit, Narcotics, and the Multiple Enforcement Team (MET). The Homicide Unit investigates homicides, attempted homicides, death investigations, officer involved shootings, and some felony assaults. The Narcotics Unit conducts narcotics and vice investigations. The MET unit conducts street gang investigations and serves as the Department's Special Weapons and Tactics (SWAT) team.
- The District Crimes Unit investigates all property crimes. This includes, but is not limited to; robbery, burglary, grand theft auto, extortion, pawnshops, malicious mischief, grand theft, and petty theft.
- The Identification Bureau provides 24-hour a day, seven days a week, forensic evidence processing.
- Property manages evidence and property recovered by officers.
- Crime Analysis provides statistical data in support of patrol officers and investigations personnel.

Services Division

The Services Division is under the command of the Services Division Captain and consists of four units: the Records Bureau, Finance Unit, Personal and Training Unit, and the City Jail.

- The Records Bureau provides copies of police reports, report crime statistics, and offers fingerprinting, permits, licenses, and registration services.
- The Personnel and Training Unit coordinates the hiring and the training of law enforcement trainees, police officers, reserve police officers, dispatchers, volunteers, and Citizens Patrol individuals.
- The Finance Unit coordinates all the department expenditures and budget accounts.
- The Jail Unit provides booking and temporary custody facilities for persons arrested by officers. Staffing of the jail is set by contract with a private security firm.

Volunteer, Training and Other Programs

The San Bernardino Police Department also offers volunteer opportunities and training. The Police Department has a reserve unit consisting of approximately 27 reserve officers at various levels of training. These volunteer police officers perform many of the same tasks as the fulltime officers, including powers of arrest. The Citizen Patrol program involves members of the community in deterring crimes and to help officers in such areas as traffic control, citation writing, crime prevention programs, extra patrols, and vacation checks. These volunteers are able to assist the Community Service Officers after going through a three-month training. In addition to Citizen Patrol, Specialized Volunteers are involved in areas of firing range, detective bureau, traffic bureau, translation, property and evidence, identification bureau, crime free rental housing and personnel and training.

Additional programs offered by the Department for community development and crime prevention include the Chaplain's Program and Explorer Post. The Chaplain's Program, and Cops and Clergy represents the integration of faith and justice. The Department uses such means to share their knowledge with the population through faith-based organizations. This is also an opportunity for police officers to interact with troubled population in an informal setting. The Explorer Post program offers adolescents between the ages

of 14 and 21 a chance to interact positively with police officers and to receive training in law enforcement. This program also teaches ethics, teamwork, responsibility, self-esteem and discipline.

Arrowhead Springs

Currently, only a portion of the Arrowhead Springs Specific Plan area is located within the City limits of San Bernardino. While the southwestern portion of the Arrowhead Springs Specific Plan area is currently serviced by the San Bernardino Police Department, the majority of the area currently lies outside the service boundary for the Department. Therefore, police service in the Arrowhead Springs area is predominately served by the San Bernardino County Sheriffs Department. Upon implementation of the Arrowhead Springs Specific Plan, the Arrowhead Springs area would be incorporated into the City's boundaries in its entirety and become under the jurisdiction of the San Bernardino City Police Department. Table 5.12-2 lists the distance to the following police stations from the Arrowhead Springs Specific Plan area.

Table 5.12-2
Distance from the Arrowhead Springs Specific Plan Area to the City of San Bernardino Police Department District Offices

Police District	*Location*	*Distance from the Project Area (Miles)*
Northern	941 Kendall Drive	4.6
Eastern	1535 E. Highland Avenue	6.3
Central	334 W. Baseline Street	6.6
Western	1574 W. Baseline Street #103	8.4
Western: Main	1332 West 5th Street	8.9
Southern	204 Inland Center	10.1

Source: City of San Bernardino Police Department

5.12.2.2 Thresholds of Significance

PP-1 Result in a substantial adverse physical impact associated with the provisions of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for police protection services.

5.12.2.3 Environmental Impacts

San Bernardino General Plan

The following impact analysis addresses thresholds of significance for which the Initial Study disclosed potentially significant impacts. The applicable thresholds are identified in parentheses after the impact statement.

GP IMPACT 5.12-2: ***BUILD-OUT OF THE SAN BERNARDINO GENERAL PLAN WOULD INTRODUCE NEW STRUCTURES, RESIDENTS, AND WORKERS INTO THE CITY OF SAN BERNARDINO POLICE SERVICE BOUNDARIES, THEREBY INCREASING THE REQUIREMENT FOR POLICE PROTECTION, FACILITIES, AND PERSONNEL. [THRESHOLD PP-1]***

Impact Analysis: Build-out in accordance with the San Bernardino General Plan would result in an increase in demand for police protection services within the City of San Bernardino. As a result of an increase in demand due to future growth within the City of San Bernardino, new facilities, equipment and personnel may be necessary to maintain adequate level of service for the City. Staffing for the San Bernardino Police Department is not based on any ratio of officers per 1,000 population but District beat boundaries and staffing assignments are evaluated to maintain a balance of service across the City in order to maintain an adequate level of service. Currently the City of San Bernardino Police Department has 312 officers. Buildout of the General Plan Update would require additional police service within the City of San Bernardino Police Department. Service levels would be evaluated and District beat boundaries and staffing assignments may be modified based on an increase in population in the northern portions of the City.

Relevant General Plan Policies and Programs

The following City of San Bernardino General Plan policies and programs related to police services include:

Public Facilities and Services Element

Policy 7.1.1: Maintain a complement of personnel in the Police Department that is capable of providing a timely response to criminal activity and can equitably protect all citizens and property in the City.

Policy 7.1.2: Coordinate inter-agency agreements with the County and adjacent jurisdictions to provide assistance and cooperation on inter-jurisdictional cases.

Policy 7.1.3: Continue to support and encourage community-based crime prevention efforts through regular interaction and coordination with existing neighborhood watch programs, assistance in the formation of new neighborhood watch groups, and regular communication with neighborhood and civic organizations.

Policy 7.1.4: Assist the San Bernardino City Unified School District and other educational agencies creating a program of early intervention for students that will provide instruction, recreation, and training programs outside of the classroom.

Policy 7.1.5: Ensure that landscaping (i.e., trees and shrubbery) around buildings does not obstruct views required to provide security surveillance.

Policy 7.1.6: Require adequate lighting around residential, commercial and industrial buildings in order to facilitate security surveillance.

Policy 7.1.7: Require the provision of security measures and devices that are designed to increase visibility and security in the design of building siting, interior and exterior design, and hardware.

Arrowhead Springs Specific Plan

AHS IMPACT 5.12-2: ***INCORPORATION AND DEVELOPMENT WITHIN THE ARROWHEAD SPRINGS SPECIFIC PLAN AREA WOULD INTRODUCE NEW STRUCTURES, RESIDENTS, AND WORKERS INTO THE CITY OF SAN BERNARDINO POLICE SERVICE BOUNDARIES, THEREBY INCREASING THE REQUIREMENT FOR POLICE PROTECTION FACILITIES AND PERSONNEL. [THRESHOLD PP-1]***

Impact Analysis: Currently the Arrowhead Springs Specific Plan area is within the service boundary of San Bernardino County Sheriffs Department. With incorporation of this area into the City limits, the Arrowhead Springs Specific Plan area would be under the jurisdiction of the San Bernardino City Police Department. According to the San Bernardino City Police Department, there are currently no plans to provide facilities within the Arrowhead Springs Specific Plan area. According to Table 5.12-2, the nearest police district office is 4.6 miles away on Kendall Drive. The addition of the Arrowhead Springs Specific Plan area to the service boundary and the subsequent build-out of the area would increase the need for police services to respond to the Arrowhead Springs area. According to San Bernardino City Police Department, incorporation of this area into the department's service area could strain current resources. The distance to the nearest station may affect response times and the closest station may not have the appropriate amount of personnel. Build-out of the Arrowhead Springs Specific Plan would occur over a period of 10 years. During this time, District beat boundaries and staffing assignments may need to be modified based on an increased demand within the northern, mountainous portions of the City.

5.12.2.4 Existing Regulations and Standard Conditions

No specific existing regulations and standard conditions apply to either the San Bernardino General Plan Update or the Arrowhead Springs Specific Plan for provision of police services. However, the revenue sources and budgetary process of the City of San Bernardino would assure that sufficient funding is available when necessary to provide the appropriate police services and facilities as growth occurs.

5.12.2.5 Level of Significance Before Mitigation

San Bernardino General Plan

Upon implementation of General Plan policies, regulatory requirements, and standard conditions of approval, the following impact to police services would be less than significant.

GP Impact 5.12-2 Build-out of the San Bernardino General Plan would result in the need for additional police facilities, equipment and personnel in order to maintain adequate response times; however allocation of personnel would be adjusted to areas when and where needed and additional personnel and facilities would be funded through the normal budgetary process as growth occurs and revenue sources increase as a result of increased development.

Arrowhead Springs Specific Plan

Upon implementation of regulatory requirements and standard conditions of approval, the following impact to police services would be less than significant.

AHS 5.12-2 Incorporation and subsequent build-out of the Arrowhead Springs Specific Plan area would result a demand for additional patrols in the area; however, as development occurs resources can be shifted to a closer station and/or police officers or facilities added as needed as part of the yearly budgetary process. The

development of the Arrowhead Springs area would contribute additional revenue to the City which would partially off-set the increase in demand.

5.12.2.6 Mitigation Measures

No significant impacts were identified and no mitigation measures are necessary.

5.12.2.7 Level of Significance After Mitigation

The existing regulations and standard conditions above would reduce potential impacts associated with police protection services to a level that is less than significant, requiring no mitigation measures. Therefore, no significant unavoidable adverse impacts relating police protection services have been identified.

5.12.3 School Services

5.12.3.1 Environmental Setting

San Bernardino

The City of San Bernardino and SOI areas are served primarily by the San Bernardino City Unified School District (SBCUSD). Schools in the SBCUSD operate on a year-round track and traditional school year system. Tables 5.12-3, 5.12-4, and 5.12-5 list elementary, middle, and high schools within the SBCUSD, respectively.

Table 5.12-3
Elementary Schools Within the San Bernardino City Unified School District

Name	Location	Current Enrollment
Abraham Lincoln Elementary School	255 W. 13th Street, San Bernardino	1260
Anderson School Elementary School	24302 E. 4th Street, San Bernardino	129
Arrowhead Elementary School	3825 Mt. View Avenue, San Bernardino	460
Barton Elementary School	2214 Pumalo Street, San Bernardino	567
Belvedere Elementary School	2501 E. Marshall Boulevard, Highland	861
Bonnie Oehl Elementary School	2525 Palm Avenue, Highland	795
Bradley Elementary School	1300 Valencia Avenue, San Bernardino	983
Burbank Elementary School	198 W. Mill Street, San Bernardino	420
California Elementary School	2699 N. California Street, San Bernardino	593
Carmack Elementary School	4777 State Street, San Bernardino	90
Cole Elementary School	1331 Cole Avenue, Highland	528
Cypress Elementary School	26825 Cypress Street, Highland	816
Davidson Elementary School	2844 N. Davidson Avenue, San Bernardino	616
Del Rosa Elementary School	3395 N. Mountain Avenue, San Bernardino	1023
E. Neal Roberts Elementary School	494 East 9th Street, San Bernardino	1005
Emmerton Elementary School	1888 Arden Avenue, San Bernardino	868
Fairfax Elementary School	1362 Pacific Street, San Bernardino	510
Harmon Elementary School	3340 Pacific Street, Highland	19
Highland-Pacific Elementary School	3340 Pacific Street, Highland	421
Hillside Elementary School	4975 N. Mayfield Avenue	767
Hunt Elementary School	1342 Pumalo Street, San Bernardino	904
Inghram Elementary School	1695 W. 19th Street, San Bernardino	552

Table 5.12-3
Elementary Schools Within the San Bernardino City Unified School District

Name	Location	Current Enrollment
Kendall Elementary School	4951 State Street, San Bernardino	652
Kimbark Elementary School	18021 Kenwood Street, San Bernardino	459
Lankershim Elementary School	7499 Lankershim Avenue, Highland	943
Lytle Creek Elementary School	275 S. "K" street, San Bernardino	810
Marshall Elementary School	3288 N. "G" Street, San Bernardino	663
Monterey Elementary School	794 Monterey Street, San Bernardino	794
Mt. Vernon Elementary School	1271 W. 10th Street, San Bernardino	744
Muscoy Elementary School	2119 W. Blake Street, San Bernardino	656
Newmark Elementary School	4121 N. 3rd Avenue, San Bernardino	535
North Park Elementary School	5378 N. "H" Street, San Bernardino	903
Palm Avenue Elementary School	6565 Palm Avenue, San Bernardino	721
Parkside Elementary School	3775 N. Waterman Avenue, San Bernardino	737
Ramona Alessandro Elementary School	670 Ramona Avenue, San Bernardino	836
Riley Elementary School	1266 N. "G" Street, San Bernardino	959
Rio Vista Elementary School	1451 N. California Street, San Bernardino	703
Roosevelt Elementary School	1554 N. Garner Avenue, San Bernardino	745
Thompson Elementary School	7401 Church Avenue, Highland	828
Urbita Elementary School	771 S. "J" Street, San Bernardino	490
Vermont Elementary School	3695 Vermont Street, San Bernardino	736
Warm Springs Elementary School	7497 Sterling Avenue, San Bernardino	971
Wilson Elementary School	2894 N. Belle Street, San Bernardino	790

Source: San Bernardino Unified School District, School Accountability Report Card, 2003-2004.

Table 5.12-4
Middle Schools Within the San Bernardino City Unified School District

Name	Location	Current Enrollment
Arrowview Middle School	2299 N. "G" Street, San Bernardino	1989
Curtis Middle School	1472 E. 6th Street, San Bernardino	1191
Del Vallejo Middle School	1885 E. Lynwood Drive, San Bernardino	1532
Dr. Martin Luther King Jr. Middle School	1250 N. Medical Center Drive, San Bernardino	1420
Golden Valley Middle School	3800 N. Waterman Avenue, San Bernardino	1398
Richardson Middle School	455 S. "K" Street, San Bernardino	584
Serrano Middle School	3131 Piedmont Drive, Highland	1242
Shandin Hills Middle School	4301 Little Mountain Drive, San Bernardino	1883

Source: San Bernardino Unified School District, School Accountability Report Card, 2003-2004.

Table 5.12-5
High Schools Within the San Bernardino City Unified School District

Name	Location	Current Enrollment
Arroyo Valley High School	1881 W. Baseline Street San Bernardino	2511
Cajon High School	1200 Hill Drive, San Bernardino	2534
Pacific High School	1020 Pacific Street, San Bernardino	2486
San Andreas High School	3232 E. Pacific Street, Highland	350
San Bernardino High School	1850 North E. Street, San Bernardino	2677
San Gorgonio High School	2299 E. Pacific Street, San Bernardino	2950
Sierra High School	570 East 9th Street, San Bernardino	494

Source: San Bernardino Unified School District, School Accountability Report Card, 2003-2004.

To approximate the future need for schools, the SBCUSD uses an adjusted student generation factor based on residential units constructed in the District complied with existing school attendance. The adjusted student generation factors from SBCUSD are listed below in Table 5.12-6.

Table 5.12-6
Adjusted Student Generation Factors

School Level	Single-Family Detached Student Generation Factor (SGF)	Single-Family Attached and Multi-Family Student Generation Factor (SGF)
Elementary	0.4451	0.6200
Middle School	0.1577	0.1000
High School	0.1859	0.1800

Source: San Bernardino City Unified School District. School Facilities Needs Analysis, March 1, 2005

In addition to public schools, the San Bernardino County Superintendent of Schools (SBCSS) acts as an intermediate service agency between the California Department of Education and the 38 school districts in San Bernardino County to help meet the educational needs of all children countywide. The SBCSS runs three community day schools within the San Bernardino area, which are listed in Table 5.12-7.

Table 5.12-7
Facilities within the City of San Bernardino
Operated by the San Bernardino County Superintendent of Schools

Name	Location	Classrooms	Current Enrollment
Galaxy Community Day School	1491 E. Art Townsend Drive, San Bernardino	4	80
Tri-City Community Day School	697 S. Allen, San Bernardino	3	60
8th Street Community Day School	450 8th Street, San Bernardino	2	40

Source: San Bernardino County Superintendent of Schools

Arrowhead Springs

The Arrowhead Spring Specific Plan area is located entirely within the SBCUSD and is served by the schools within the District boundaries, as discussed above. The schools closest to the Arrowhead Springs project area include the Arrowhead Elementary School, the Arrowview Middle School and the Arroyo Valley Senior High.

5.12.3.2 Thresholds of Significance

SS-1 Result in a substantial adverse physical impact associated with the provisions of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for school services.

5.12.3.3 Environmental Impacts

San Bernardino General Plan

GP IMPACT 5.12-3: BUILD-OUT OF THE CITY OF SAN BERNARDINO GENERAL PLAN WOULD GENERATE 21,570 ADDITIONAL ELEMENTARY, MIDDLE, AND HIGH SCHOOL STUDENTS THAT WOULD IMPACT THE SCHOOL ENROLLMENT CAPACITIES OF THE CITY OF SAN BERNARDINO UNIFIED SCHOOL DISTRICT. [THRESHOLD SS-1]

Impact Analysis: Build-out of the City of San Bernardino General Plan would result in a total build-out of 46,942 single-family units and 48,692 multi-family units in the City and Sphere of Influence (SOI) areas resulting in an increase of 32,250 residential units from the year 2000 existing housing stock.[23] Currently, the SBCUSD has a 2004-2005 total student enrollment of 59,279 students. The capacity of the SBUSD for the 2004-2005 year is 46,727 students resulting in facility shortage for 12,552 students. Using the SBCUSD student generation rates, build-out of the General Plan would result in a total student population for the City and SOI areas of 51,067 elementary school students, 12,285 middle school students, and 17,497 high school students (See Table 5.12-8), an overall growth of 36.4 percent. Growth in the student population in the City of San Bernardino and SOI areas would necessitate the need for additional school facilities and personnel within the SBCUSD, Colton Unified School District, Redlands Unified School District, and Rialto Unified School District.

Table 5.12-8
Anticipated Student Enrollment for the SBCUSD

School Level	2004-2005 Student Enrollment	GP Build-out City Student Population	GP Build-out SOI Student Population	GP Build-out Total	Total Student Growth (%)
Elementary (K-5)	34,234	44,591	6,476	51,067	16,833 (49.2%)
Middle School (6-8)	9,276	10,479	1,806	12,285	3,009 (32.4%)
High School (9-12)	15,769	15,114	2,383	17,497	1,728 (10.0%)
Total	**59,279**	**70,184**	**10,665**	**80,849**	**21,570 (36.4%)**

[2] For the purposes of school generation estimation, multi-family residential units were defined as single-family attached and multi-family units.

[3] The City of San Bernardino 2000 housing stock total was 63,414 units. U.S. Census Bureau, Census 2000.

Relevant General Plan Policies and Programs

The following City of San Bernardino General Plan policies and programs related to education include:

Public Facilities and Services

Policy 7.3.1: Work with the local school districts, CSUSB, and SBVC to expand facilities and services to meet educational needs.

Policy 7.3.2: Work with the School District to ensure that new residential subdivisions dedicate land or contribute fees for the expansion of school facilities to meet the needs attributable to the new housing.

Policy 7.3.3: Work with the School District to consider alternative funding programs for school facilities construction and provision of educational programs should there be a shortfall of traditional revenue.

Policy 7.3.4: Cooperate with the San Bernardino City Unified School District, California State University, San Bernardino, and San Bernardino Valley College to integrate educational programs and facilities; ensure that adequate educational services are provided for youth; the educational needs of the students are being monitored; and the educational curricula is being designed to meet these needs.

Policy 7.3.5: Work with the Unified School District and all local educational agencies, including private schools, to provide continuing adult education courses.

Arrowhead Springs Specific Plan

AHS IMPACT 5.12-3: BUILD-OUT OF THE ARROWHEAD SPRINGS SPECIFIC PLAN WOULD GENERATE 894 NEW ELEMENTARY, MIDDLE AND HIGH SCHOOL STUDENTS THAT WOULD IMPACT THE SCHOOL ENROLLMENT CAPACITIES OF THE SAN BERNARDINO CITY UNIFIED SCHOOL DISTRICT. [THRESHOLD SS-1]

Impact Analysis: Currently the Arrowhead Springs Specific Plan area has few residential dwelling units contributing student population to area schools. Build-out of the Arrowhead Springs Specific Plan area would result in a total build-out of 1,350 units. Of these potential units, 465 are proposed single-family units, 585 are multi-family attached units and 300 are senior units. Excluding the senior units, because these units do not usually have school age children and applying the SBCUSD student generation rates per household, build-out of the Arrowhead Springs Specific Plan would result in an increase in 570 elementary school students, 132 middle school students, and 192 high school students. The schools closest to the Arrowhead Springs project area include the Arrowhead Elementary School, the Arrowview Middle School and the Arroyo Valley Senior High. However these schools are nearing capacity and may not be able to accommodate the influx of student with current facilities. Growth in the Arrowhead Springs Specific Plan area would therefore necessitate the need for additional school facilities and personnel in the SBCUSD, Colton Unified School District, Redlands Unified School District, and Rialto Unified School District.

5.12.3.4 Existing Regulations and Standard Conditions

The existing regulations and standard conditions apply to both the San Bernardino General Plan Update and the Arrowhead Springs Specific Plan.

- Senate Bill 50 (SB 50, also known as Proposition 1A, codified in Government Code Section 65995) was enacted in 1988 to address how schools are financed and how development projects may be assessed for associated school impacts. SB 50 provides three ways to determine funding levels for school districts. The default level allows school districts to levy development fees to support school construction necessitated by that development and receive a 50 percent match from State bond

money. Based on the current fee structure, any commercial or industrial construction can be assessed a maximum fee of thirty-six cents ($0.36) per square foot of chargeable covered and enclosed space. "Chargeable covered and enclosed space," is defined as, the covered and enclosed space determined to be within the perimeter of a commercial or industrial structure, not including any storage areas incidental to the principal use of the construction, garage, parking structure, unenclosed walkway, or utility or disposal area. The determination of the chargeable covered and enclosed space within the perimeter of a commercial or industrial structure would be made by the City of San Bernardino, in accordance with the building standards of the City. Based on the current fee structure for residential developments, construction can be assessed a maximum fee of two dollars and twenty-four cents ($2.24) per square foot for redevelopment or three dollars and ninety-seven cents ($3.97) per square foot for new developments. As of April 2005, the San Bernardino City Unified School District will have adopted a revised fee structure for new residential developments of four dollars and twenty-eight cents ($4.28) per square foot.

5.12.3.5 Level of Significance Before Mitigation

San Bernardino General Plan

Upon implementation of General Plan policies, regulatory requirements, and standard conditions of approval, the impact to school services would be less than significant.

GP Impact 5.12-3 Build-out of the San Bernardino General Plan would result in a substantial increase in student population necessitating the need for additional school facilities and personnel. However, construction and operation of new school facilities would be funded through school impact fees assessed on new developments and redevelopments that occur within the SBCUSD or any nearby district.

Arrowhead Springs Specific Plan

Upon implementation of regulatory requirements and standard conditions of approval, the impact to school services would be less than significant.

AHS Impact 5.12-3 Build-out of the Arrowhead Springs Specific Plan area would result in an increase in student population of 894 students, necessitating the need for additional school facilities and personnel. However, new developments and redevelopment in the Arrowhead Springs Specific Plan area are assessed a school impact fee that funds construction and operation of the SBCUSD.

5.12.3.6 Mitigation Measures

No significant impacts were identified and no mitigation measures are required

5.12.3.7 Level of Significance After Mitigation

The existing regulations and standard conditions above would reduce potential impacts associated with school services to a level that is less than significant, requiring no mitigation measures. Therefore, no significant unavoidable adverse impacts relating school services have been identified.

5.12.4 Library Services

5.12.4.1 Environmental Setting

San Bernardino General Plan

The San Bernardino City Public library system consists of a Central Library and three branches located in the planning area. According to the City of San Bernardino Public Libraries, the existing library system has over an estimated 236,000 volumes.

Norman F. Feldheym Central Library

The Feldheym Central Library, built in 1985 and located at 555 West 6th Street, is the largest library in the San Bernardino system and contains a comprehensive collection of fiction and nonfiction books. Central Library's service area consists of the entire city of San Bernardino. The 64,800-square-foot Central Library houses a collection of approximately 156,817 volumes including 350 periodical subscriptions, and 20 newspaper subscriptions. Feldheym Branch also serves as a location for administrative services for all the San Bernardino City libraries. The facility offers three meeting rooms: Bing Wong auditorium, Mary Belle Kellogg Rooms A and B; California Room, which holds research material on the City's past; Technical Services Center, which processes books for all branches before they are placed on shelves; and administrative offices.

The Feldheym Branch Library offers a variety of programs and facilities for public use. This facility has six computers with Internet for reference purposes, a typewriter, a Public Address system, a piano, and databases that can be accessed from home or the library for research purposes. In addition, this branch provides Cosand Computer Learning Center with 24 computer workstations and workshops and classes on basic computer usage; and a Literacy Center that provides small group tutoring and classes in Adult Basic Education (ABE), English as a Second Language (ESL), Families for Literacy (FFL), After School Homework Assistance, and Citizenship preparation to individuals who would like assistance in such areas.

Dorothy Ingram Public Library

Dorothy Ingram Library, built in 1977 and located at 1505 West Highland, serves the west end of San Bernardino. The 3,000-square-foot library houses a collection of approximately 16,630 volumes including, twenty-nine periodical subscriptions, and two newspaper subscriptions, including a large number of books of interest to the Black community. The video collection has over 800 titles available for checkout, and the Branch also has books in Spanish for both adults and juveniles. There are six public use computers, all with Internet access, word processing, and learning games for children. One computer has a "homework help" tutor program that is available during afternoon hours.

Howard M. Rowe Library

Howard M. Rowe Library, built in 1968 and located at 108 East Marshall Boulevard, serves the northern area of San Bernardino. The 5,655-square-foot library houses a collection of approximately 41,080 volumes including, 67 periodical subscriptions, four newspaper subscriptions, and books in Spanish. Rowe Branch library resources include audio books, large print books, Young adult books, videos, DVDs, four computers equipped with Internet, word processing, maps, encyclopedia research and other educational programs for public use. This facility also hosts Thursday morning story time, Summer Reading Game, Arts and Craft time in July and August and a Teen Night each spring and fall. Rowe Library encourages young adults to read through a Readers' Theatre during the summer, for those 11 through 16 years of age. Currently, the City's long-range plans include the expansion of the Howard M. Rowe Branch.

Paul Villaseñor Library

Paul Villaseñor Library, built in 1980 and located at 525 North Mt. Vernon Avenue, serves the west San Bernardino area. The 7,500-square-foot library houses a collection of approximately 22,299 volumes, of which over 3,500 are Spanish titles for both adults and children. This facility also holds Spanish music cassettes, English and Spanish videos for checkout and six computers equipped with Internet, word processing programs, educational programs etc. for public use.

In addition to City's public library system, the San Bernardino planning area is also served by the San Bernardino County Library and the library at California State University of San Bernardino.

San Bernardino County Library

Library services outside the City (in the SOI) are provided by the San Bernardino County Libraries. Residents of unincorporated areas of San Bernardino and from cities such as Highland, Rialto, Lake Arrowhead, and Fontana have access to 29 County branches and over 1,167,000 volumes. Services offered include Youth Services, Book Mobiles, Books by Mail, Interlibrary Loan, and Library Literacy among other programs.

All libraries in the planning area provide patron access to catalog via home computer, automated library circulation system, and automated catalog for accurate, efficient control of materials, and handicap access to library facilities. Because the City libraries and the San Bernardino County library system, is part of the Inland Valley Library System, residents can use any of the City or County libraries within the County boundaries.

California State University of San Bernardino

The California State University of San Bernardino's John M. Pfau Library located on 5500 University Parkway, services the north area of the City. This is a 49,205-square-foot facility with more than 610,000 books, bound periodicals, and other print items. Community members not enrolled at this University can access library services through a membership fee.

Arrowhead Springs Specific Plan

Unincorporated areas of the Arrowhead Springs Specific Plan area are currently served by the San Bernardino County Library, as discussed above. Although portions of the Arrowhead Springs Specific Plan area are served by the City of San Bernardino Public Library system, upon annexation into City, the Arrowhead Springs Specific Plan area would also have access to the collections contained within the City's public library system. The closest public library to the Arrowhead Springs Specific Plan area is the Howard M. Rowe Branch, located 8.9 miles from the Arrowhead Springs Specific Plan area.

5.12.4.2 Thresholds of Significance

LS-1 Result in a substantial adverse physical impact associated with the provisions of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for library services.

5.12.4.3 Environmental Impacts

San Bernardino General Plan

GP IMPACT 5.12-4: BUILD-OUT OF THE CITY OF SAN BERNARDINO IN ACCORDANCE WITH THE GENERAL PLAN WOULD GENERATE ADDITIONAL POPULATION, INCREASING THE SERVICE NEEDS FOR THE SAN BERNARDINO PUBLIC LIBRARY SYSTEM. [THRESHOLD LS-1]

Impact Analysis: Build-out of the City of San Bernardino General Plan would result in an increase in population in the City of San Bernardino which is served by the City of San Bernardino Public Library system. Currently, the City of San Bernardino Library system houses over 276,000 volumes. Based on the Division of Library Development Services of the State of California's standard of 1.5 volumes per capita, the existing volumes within the City's public library system can serve a population of about 184,000, which is less the City's population projection of approximately 196,300 in 2004[4]. According to this level of service standard, there is not sufficient capacity within the existing library system. The American Library Association rates the San Bernardino Public Library at a 30th percentile based on the existing circulation, staffing, volumes in the collection, reference transactions, and funding levels compared to the City's population.

In addition, the Library has determined that new branches are desirable in both the Mountain Shadows and Verdemont/Devore areas of the City and expansion would be necessary for the Howard M. Rowe Branch. Upon build-out of the General Plan there is an anticipated population of people living in the City of San Bernardino and SOI areas. Therefore, build-out in accordance with the General Plan would necessitate the need for the addition of 202,862 volumes of books, nearly double that of the existing collection, to support future populations.

Relevant General Plan Policies and Programs

The following City of San Bernardino General Plan policies and programs related to library services include:

Public Facilities and Services Element

Policy 7.4.14: Construct new libraries and rehabilitate and expand existing library facilities and programs as required to meet the needs of existing and future residents.

Policy 7.4.15: Acquire materials for the library facilities that reflect the needs and interests of the City residents.

Policy 7.4.16: Provide outreach services for seniors and the handicapped, if they cannot visit library facilities.

Policy 7.4.17: Provide appropriate linkages for the library's use of telecommunication and computer-based data for the storage, retrieval, and display of information including online access and CD Rom, as technologies develop and are standardized.

Policy 7.4.18: Continue to provide funding for library facilities and activities, examining other potential funding sources, including state and federal and corporate and private contributions.

Policy 7.4.19: Develop and install automated library circulation system and automated catalog for accurate and efficient control of materials.

[4] 2004 Population obtained from the California Department of Finance Demographic Research Unit.

Arrowhead Springs Specific Plan

AHS IMPACT 5.12-4: ***BUILD-OUT IN ACCORDANCE WITH THE ARROWHEAD SPRINGS SPECIFIC PLAN WOULD GENERATE ADDITIONAL POPULATION INCREASING THE SERVICE NEEDS FOR THE HOWARD M. ROWE BRANCH LIBRARY WITHIN THE CITY OF SAN BERNARDINO PUBLIC LIBRARY SYSTEM. [THRESHOLD LS-1]***

Impact Analysis: As stated above, the existing library collections of the City of San Bernardino Public Library are not sufficient to serve the City's existing population. Upon annexation into the City of San Bernardino, the residents of the Arrowhead Springs Specific Plan area would strain the City's existing public library system. The anticipated future population of Arrowhead Springs is 4,233 persons resulting in a need of 6,350 volumes of books for the library collection based upon American Library Association rates. Population increases in the Arrowhead Springs area from build-out in accordance with the Arrowhead Springs Specific Plan, would result in an increased demand for library services primarily affecting the Howard M. Rowe Branch Library, which is the closest library to the Arrowhead Springs Specific Plan area. .

5.12.4.4 Existing Regulations and Standard Conditions

No existing regulations and standard conditions apply to either the San Bernardino General Plan Update or the Arrowhead Springs Specific Plan for provision of library services. However, the library services within the City are funded through normal revenue sources and the yearly budgetary process. As growth increases so will revenues.

5.12.4.5 Level of Significance Before Mitigation

San Bernardino General Plan

Upon implementation of General Plan policies, the impact to library services would be less than significant.

GP Impact 5.12-4 Build-out of the San Bernardino General Plan would result in an increase in population within the City necessitating the need for additional collections for the public libraries within the City of San Bernardino Public Library system. However, capitol costs to provide additional facilities and improvements would be funded by the State Library Fund bond measure and operating costs through the normal City revenue sources and budgetary process

Arrowhead Springs Specific Plan

Upon implementation of regulatory requirements and standard conditions of approval, the impact to library services would be less than significant.

AHS Impact 5.12-4 Incorporation and subsequent build-out of the Arrowhead Springs Specific Plan area into the City of San Bernardino would strain the City's existing public library system and place additional use on the Howard M. Rowe Branch Library. Currently, expansion of the Howard M. Rowe Branch Library is incorporated into the City of San Bernardino Public Library's long-range plans. Capitol costs to provide improvements to this branch would be funded by the State Library Fund bond measure and additional operation and maintenance costs would be funded through normal City revenue sources and the yearly budgetary process.

5.12.4.6 Mitigation Measures

No significant impacts have been identified and no mitigation measures are required.

5.12.4.7 Level of Significance After Mitigation

Impacts on library services are considered less than significant and mitigation measures are not necessary. Therefore, no significant unavoidable adverse impacts relating to library services have been identified.

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5.13 RECREATION

5.13.1 Environmental Setting

5.13.1.1 San Bernardino General Plan

Open space provides a multitude of functions that are beneficial to the community; including park and recreation areas, recreational trails, conservation of natural and significant resources, buffers between land uses, and the preservation of scenic views. The City of San Bernardino has convenient access to several active and passive open space areas. Active recreation areas typically include facilities such as tailored playing surfaces, buildings, parking areas and similar modifications to a natural site. Passive recreation areas accommodate less structured recreational pursuits and typically include minor modifications such as trails, service vehicle access improvements, enhanced landscape materials and similar non-intrusive changes to the site.

There are a total of 52 developed parks and recreational facilities in the city, encompassing 539.98 acres. Table 5.13-1 lists the park facilities and special recreational facilities within the City of San Bernardino.

Table 5.13-1
Park Facilities within the City of San Bernardino

Public Park and Recreation Facility	Location	Type	Size (Acres)
Mini-Parks			
Newberry Park	560 Hill Drive	Mini-Park	1.53
Unnamed	SWC Magnolia Avenue and Meyers Road	Mini-Park	0.5
Unnamed	NWC Kendall Dr. and Campus Parkway	Mini-Park	1.6
Unnamed	SWC Christine St. and Christopher St.	Mini-Park	1.3
Tom Gould Park	240 W. 40th Street	Mini-Park	0.51
Sierra Park	3800 Sierra Way	Mini-Park	1.13
Sonora Tot Lot	1286 Sonora Street	Mini-Park	0.17
Center for Individual Development	8088 Palm Lane	Mini-Park	5.00
Campo Santo Memorial Park	2651 “D” Street	Mini-Park	5.50
Meadowbrook Field House and Park	179 E. Rialto	Mini-Park	4.96
Del Rosa School Field	3395 N. Mountain Avenue	Mini-Park	0.50
Gutierrez Field	14th & Mt. Vernon	Mini-Park	1.98
Golden Valley School Field	3800 N. Waterman Avenue	Mini-Park	1.00
Ninth Street Park	2391 Garner	Mini-Park	3.62
Guadalupe Field	780 Roberds	Mini-Park	2.25
La Plaza Park	685 Mt. Vernon Avenue	Mini-Park	2.04
Richardson School Field	455 South ‘K’ Street	Mini-Park	1.00
		Total City Mini-Park	34.59
Neighborhood Parks			
Newark Field (Karl Karper)	3898 Pershing	Neighborhood Park	5.02
Littlefield/Shultis Park	Buckboard & Kendell Way	Neighborhood Park	15.00
Hudson Park	4365 Park Drive	Neighborhood Park	10.10
Horine Park	3150 Waterman	Neighborhood Park	5.67
Harrison Canyon Park	39th & Golden	Neighborhood Park	6.00
Del Vallejo School Field	Sterling and Lynwood	Neighborhood Park	6.00
Meadowbrook Park/Hernandez Center	2nd and Sierra	Neighborhood Park	14.12
Colony Park	Weir Road and Heritage Drive	Neighborhood Park	6.40
Unnamed	SWC Chestnut Ave. and Washington St.	Neighborhood Park	3.7

Table 5.13-1
Park Facilities within the City of San Bernardino

Public Park and Recreation Facility	Location	Type	Size (Acres)
Unnamed	NWC Palm Ave. and Irvington Ave.	Neighborhood Park	5.4
Unnamed	SWC Pine Ave. and Belmont Ave.	Neighborhood Park	3.4
Unnamed	NW of Pine Ave. and Ohio Ave.	Neighborhood Park	4.8
Anne Shirrells Park	1367 N. California	Neighborhood Park	12.00
Pioneer Park	565 "F" Street	Neighborhood Park	5.00
Encanto Park	1180 W. 9th Street	Neighborhood Park	8.90
Nicholson Park	2750 W. 2nd Street	Neighborhood Park	9.52
Unnamed Park in New Development	SEC Northpark Blvd. & Campus Pkwy.	Neighborhood Park	2.4
Unnamed Park in New Development	SEC Northpark Blvd. & Campus Pkwy.	Neighborhood Park	3.5
Blake Street Park	NEC Blake St. and Bronson St. in the Muscoy Unincorporated Area	Neighborhood Park	8.7
		Total City Neighborhood Parks	130.33
Community Parks			
Blair Park	1466 W. Marshall Boulevard	Community Park	34.00
Al Guhn/Verdemont Park	3650 Little League	Community Park	28.00
Wildwood Park	536 E. 40th Street	Community Park	24.20
Speicher Park/Patton South	1535 North Arden	Community Park	28.00
Palm Field	888 E. 6th Street	Community Park	22.30
Mill Park	503 Central	Community Park	14.30
Delmann Heights Park	2969 Flores	Community Park	19.70
Norton Gym/Galaxy Ballroom	1554 Art Townsend Drive	Community Park	3.72
Nunez Park	1717 W. 5th Street	Community Park	22.04
Lytle Creek Park	380 S. "K" Street	Community Park	17.90
		Total City Community Parks	214.16
Regional Parks			
Perris Hill Park	607 E. Highland	Regional Park	64.40
Seccombe Lake Park	160 E. 5th Street	Regional Park	44.00
San Bernardino Soccer Complex	2500 E. Pacific	Regional Park	50.00
		Total City Regional Parks	158.40
Special Facilities – Community Centers and Senior Centers			
Fifth Street Senior Center	600 W. 5th Street	Senior Center	0.50
Perris Hill Senior Center	780 W. 21st Street	Senior Center	1.00
North Norton Community Center	24424 Monterey	Community Center	1.00
		Total Special Facilities	2.50
		Total Acres in City	539.98

Source: San Bernardino City Parks, Recreation, and Community Services Department

Mini-parks

Mini-parks are the smallest type of park, usually less than five acres, and serve a relatively small area with a service radius of one-quarter to one-half mile. They often consist of passive recreational uses and provide little to no parking. The City of San Bernardino currently has 17 mini-parks totaling 34.59 acres.

Neighborhood Parks

Neighborhood parks are intended to serve the needs of the surrounding and/or adjacent neighborhoods. Park sizes range from approximately 10 to 15 acres and serve users within a walking or bicycling radius of

approximately one-half to one mile. Typical neighborhood park facilities include play apparatus areas, court games, limited family picnic areas and open space for informal field sports. The City of San Bernardino currently has 19 neighborhood parks totaling 130.33 acres.

Community Parks

Community parks serve several neighborhoods and have a service radius of one to two miles. Their size ranges from 15 to 30 acres and they provide similar and larger amenities than a neighborhood park. These amenities generally include lighted ball fields, tennis courts, and community centers or recreation buildings. Community parks are also designed for vehicular as well as pedestrian access. Community parks are located adjacent to middle or high schools, when possible, in an attempt to facilitate joint-use with local school districts. The City of San Bernardino currently has 10 community parks totaling 214.16 acres.

Regional Parks

Regional parks are at least 50 acres in size and offer a wide range of amenities to attract the greatest range of users and interests within and outside of the city. Regional parks provide significant natural features and passive and active recreational features such as sports fields/courts, picnicking, fishing, hiking, and camping. The City of San Bernardino has 3 regional parks totaling 158.40 acres.

In addition to City facilities, the County Regional Parks system includes Glen Helen, Yucaipa, Lake Gregory, Cucamonga, Guasti, Prado, and Mojave Narrows, all within a range of approximately 10 to 40 miles of the City of San Bernardino. The nearest to the City is Glen Helen Park, which provides a multi-faceted recreation area for fishing, boating, picnicking and other activities for many City dwellers.

Multi-Purpose Trails and Bikeways

The City of San Bernardino hosts an on-street and off-street recreational trail system. The off-street recreational trail system combines hiking, equestrian, and bike trails into Multi-Purpose trails. The on-street trail system consists of dedicated bike lanes along the pavement edge of streets while pedestrian access and recreation is provided through the City's sidewalks and hiking trails. The on-street and off-street recreation system provides a system that interconnects parks, schools, and civic facilities with each other and with the surrounding area.

Other Public Recreational Facilities

In addition to mini, neighborhood, community, and regional parks, there are individual regional facilities such as the Shandin Hills Golf Course that is a professional class, 18-hole course. This public course is owned by the City and leased to a private company for operation and maintenance. The planning area also contains the Western Regional Little League Headquarters and stadium on land owned by the City but used almost exclusively for Little League ball play.

The City also provides recreational services at the local schools, under a joint resolution adopted by the Common Council and the school district. It provides that schoolyard facilities will remain open in the daytime hours after school for recreational use of the community. The City Parks, Recreation, and Community Services Department operates a variety of recreational programs on school grounds, including the Tiny Tot program, Senior Citizen leisure programs, and active and passive programs for all age groups including after school activities during the regular school year. For the use of school building facilities and pools, the City pays rental fees. The school district reserves the right for first priority for the use of all school areas.

City of San Bernardino Park Standards

The City of San Bernardino has an adopted park standard of five acres per 1,000 residents. These define acceptable ratios of per capita park space for local parkland including a proportion of neighborhood and mini-parks based on national averages. Because these acreages are intended to accommodate different types of parks, no single set of accepted standards exist. The National Recreation and Parks Association (NRPA) has published benchmark guidelines for communities to consider for different park needs. Regional parks are not included in the NRPA standard because of their variation in size and type. The standard for the neighborhood park portion is one to two acres per 1,000 population, for mini-parks one-quarter to one-half acre per 1,000 population, and for the community park is two to three acres per 1,000 residents.

5.13.1.2 Arrowhead Springs Specific Plan

The Arrowhead Springs Specific Area is located in the San Bernardino Mountains, adjacent the San Bernardino National Forest. While regional parks, community parks and other recreational facilities located within the City of San Bernardino are available for the few current residents who live in the Arrowhead Springs Specific Plan area, the area's main recreational resource is found within the unique geologic setting of the Arrowhead Springs area. The Arrowhead Springs area has been utilized as a private resort built up around the unique geothermal resource within the Arrowhead Springs Area. Recreational facilities associated with the private resort which utilize the geothermal resources that are unique to Arrowhead Springs include the historic steam caves, mineral hot springs, and the famous Esther Williams swimming pool.

5.13.2 Thresholds of Significance

According to Appendix G of the CEQA Guidelines, a project would normally have a significant effect on the environment if the project:

R-1 Would Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated.

R-2 Includes recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment.

The following impact analysis addresses thresholds of significance for which the Initial Study, included in Appendix A, disclosed as potentially significant impacts. The applicable thresholds are identified in parentheses after the impact statement.

5.13.3 Environmental Impacts

5.13.3.1 San Bernardino General Plan

GP IMPACT 5.13-1: BUILDOUT OF THE GENERAL PLAN WOULD GENERATE ADDITIONAL RESIDENTS THAT WOULD INCREASE THE USE OF EXISTING PARK AND RECREATIONAL FACILITIES. [THRESHOLD R-1]

Impact Analysis: Buildout of the San Bernardino General Plan would generate additional residents in the San Bernardino area, which would increase the demand for parks and park usage. Based on the City's future parkland needs of 5 acres per 1,000 residents, buildout of the City's General Plan of would result in an a need for approximately 1,596 acres of parkland including, 215 acres in the unincorporated area. Currently the City provides for 379.1 acres of mini-parks, neighborhood parks, and community parks within the City and 8.7 acres in the SOI area. The General Plan Update designates 469 acres for public parks. Therefore, future buildout would result in a shortfall of 1,127 acres. Using the high end values of the NRPA guidelines, this equates to an additional need of 125 acres for mini-parks; 508 acres for neighborhood parks; and

744 acres of community parks. While buildout of the General Plan does not assume parks that may be acquired by the City or provided in new subdivisions, buildout of the General Plan will require additional parkland to accommodate growth in the City of San Bernardino and SOI areas.

Although the City has a shortfall of 1,127 acres, the projected shortfall in parks is lessened somewhat to a need for 969 acres by the fact that there are three regional parks totaling 158 acres that have active recreation facilities. In addition, many school sites, community centers and senior centers within the City are available for recreational activities. Furthermore, in addition to developed parkland, the City designates approximately 618.7 acres of undeveloped open space parkland and 664 acres of public and commercial recreation, which includes private recreational facilities, in the City, and an additional 1,312 acres of undeveloped open space and parkland and 57 acres of public and commercial recreation in the SOI areas.

GP IMPACT 5.13-2: BUILDOUT OF THE GENERAL PLAN WOULD RESULT IN ENVIRONMENTAL IMPACTS TO EXPANDED RECREATIONAL FACILITIES. [THRESHOLD R-2]

Impact Analysis: The General Plan Update is not a development project, and therefore, does not include or require the construction of recreational facilities. However, implementation of the General Plan Update may result in the construction or expansion of existing recreational facilities. The City of San Bernardino General Plan includes extension of the existing multi-purpose trails and bicycle routes. Some proposed recreational facilities and trails, if expanded, have the potential to impact sensitive biological areas within San Bernardino Mountains and Santa Ana River Watershed area.

Relevant Policies and Programs

The following General Plan policies and programs pertain to active and passive recreational facilities within the City of San Bernardino

Parks and Recreation Element

Policy 8.8-1: Establish a comprehensive parks master plan, which accomplishes the following:

- Establishes the standard of 5 acres of parkland for every 1,000 residents;
- Establishes guidelines for the types and amounts of recreational facilities and services necessary to adequately serve future residents;
- Defines park development standards based on types and sizes of parks (mini, neighborhood, community, regional) and their service area (e.g., Mini – one-quarter to one-half service radius);
- Describes the steps necessary to achieve the park standards and guidelines;
- Defines existing and anticipated recreational needs (based on population size, density, demographics, and types of facilities);
- Identifies areas in need of new or expanded recreational facilities and the types of facilities needed;
- Disperses park facilities and equipment throughout the City to prevent an undue concentration at any location; including sports fields, basketball courts, tennis courts, swimming pools, picnic areas, and other facilities;
- Identifies potential locations and types of new or expanded facilities; and
- Identifies potential funding sources.

Policy 8.1.2: Provide a variety of park "experiences", including those developed for intense recreational activity, passive open space enjoyment, and a mixture of active and passive activities.

Policy 8.1.3: Pursue the development of portions of the Santa Ana River, Lytle Creek, and flood control drainages and detention basins for recreational uses that will not inhibit flood control purposes or be adversely impacted by flooding.

Policy 8.1.4: Examine the potential use of geothermal resources for recreational use (e.g., pools).

Policy 8.1.5: Integrate parks and recreation facilities with the Master Plan for Trails and Bikeways.

Policy 8.1.6: Accommodate the recreational needs of the City's residents reflecting their unique social, cultural, ethnic, and physical limitations in the design and programming of recreational spaces and facilities.

Policy 8.1.7: Continue to evaluate the community's recreational needs and the adequacy of the City's recreational facilities and programs in meeting these needs.

Policy 8.1.8: Inform the City residents of recreational programs through the internet, cable television, newsletters, and other publications.

Policy 8.1.9: Initiate and attend joint meetings with the Forest Service, County Parks and Recreation Department, and the state to coordinate the joint use of recreational facilities, and parkland acquisition, and establish new recreational programs.

Policy 8.1.10: Maintain and expand cooperative arrangements with the San Bernardino Unified School District, City Municipal Water Department, Cal State San Bernardino and San Bernardino Valley College for after hour and summertime use of parks, pools, concert halls, and other facilities.

Policy 8.2.1: Parks shall be designed in accordance with contemporary safety standards and "CPTED" (Crime Prevention Through Environmental Design) principles.

Policy 8.2.2: Each park within the City shall be evaluated for safety and maintenance on an established schedule.

Policy 8.2.3: Encourage local individuals and groups to contribute or plant trees (in accordance with a prescribed tree planting plan) in neighborhood and community parks.

Policy 8.2.4: Develop master plans for each park to ensure that (a) the siting of buildings, open air facilities, and landscape are unified, functionally related to efficiency, and compatible with adjacent uses; and (b) landscape locations and species are coordinated with architectural and site design.

Policy 8.2.5: Design and develop parks to complement and reflect their natural environmental setting and maximize their open space character.

Policy 8.2.6: Design and improve our parks according to the following:

- Locate parks on collector or neighborhood streets, so they are easily accessible to adjacent residential neighborhoods;
- Site uses so that they do not adversely impact adjacent residences (e.g., locating high activity, noise generating, and nighttime uses away from residences);
- Fulfill the particular needs of residents of the area they serve (i.e., senior citizens, and families with children);

- Provide for parking so that it does not disrupt abutting residences; and
- Incorporate landscape that "fits" with adjacent areas.

Policy 8.2.7: Install new and replace existing landscaping where it is severely deteriorated, inappropriately located for park activities, and incompatible with other landscape and adjacent uses.

Policy 8.2.8: Ensure that all parks are adequately illuminated for safe use at night.

Policy 8.2.9: Provide for the supervision of park activities and promote enforcement of codes restricting illegal activity.

Policy 8.2.10: Restrict and control nighttime park use so that adjacent residences are not adversely affected.

Policy 8.3.1: Work cooperatively with appropriate regional agencies to facilitate development of trails that tie into other facilities such as the Santa Ana River Trail system and provide facilities along the base of the foothills, as well as connections between these facilities.

Policy 8.3.2: Establish multi-purpose trail system, along the foothills of the San Bernardino Mountains, Santa Ana River, Cajon and Lytle Creeks, and interconnecting linkages in collaboration with the U.S. Forest Service, County of San Bernardino, City of Highland, Loma Linda, and other adjacent communities.

Policy 8.3.3: Establish a recreational greenbelt system linking the river and drainage corridors with the mountains.

Policy 8.3.4: All new developments on designated routes shall provide bicycle and pedestrian routes linked to adjacent facilities.

Policy 8.3.5: Provide routes accessible for disabled persons that link public facilities and commercial areas to residential neighborhoods.

Policy 8.3.6: Adequate and secure bicycle storage facilities shall be provided for new institutional and non-residential development.

Policy 8.3.7: Provide bicycle racks in public facilities and in activity centers.

Policy 8.3.8: Install of sidewalks and wheelchair ramps in existing neighborhoods.

Policy 8.3.9: Separate bikeway and trail systems from traffic and roadways wherever possible.

Policy 8.3.10: Provide clear separation of hikers, joggers, and equestrians where possible.

Policy 8.3.11: Seek the use of easements and rights-of-way from owners and continue to negotiate agreements for the use of utility easements, flood controls channels, and railroad rights-of-way to expand its park and trail system.

Policy 8.3.12: Incorporate the following features in multi-purpose trails, bike routes, and pedestrian paths:

- Special paving or markings at intersections,
- Clear and unobstructed signing and trail/lane markings,
- Improved signal phasing,
- Vehicular turning restrictions at intersections,
- Hearing impaired cross walk signals,

- Trees to provide shade,
- Safe and well lighted rest areas, and
- Coordinated street furniture including signs, trash receptacles, newspaper stands, and drinking fountains.

Policy 8.4.1: Pursue the acquisition of surplus federal, state, and local lands to meet present and future recreation and community service needs.

Policy 8.4.2: Continue to require developers of residential subdivisions to provide fee contributions based on the valuation of the units to fund parkland acquisition and improvements.

Policy 8.4.3: Fund new neighborhood parks from Quimby fees in residential areas of the City.

Policy 8.4.4: Grant Quimby fee waivers only when parklands in excess of five contiguous and usable acres are received and when such waivers are determined to be in the best interest of City residents as certified by the Mayor and Common Council on recommendation of the Parks and Recreation Department.

Policy 8.4.5: Continue and expand mechanisms by which the City may accept gifts and dedications of parks, trails, open space, and facilities.

Policy 8.4.6: Consider the use of special taxes, sale of bonds, or assessment districts for park and trail development and maintenance.

Policy 8.4.7: Solicit funding for parkland and trail acquisition, improvement, maintenance, and programming from state and federal agencies, as available.

Policy 8.4.8: Continue to provide financial support, including user fees and in-lieu fees, for summer lunch, playground, swimming pool programs and recreational facilities, and other appropriate programs.

Policy 8.4.9: Solicit state, federal and other agency revenue to fund recreational programs, as it is available.

Policy 8.4.10: The City shall not construct facilities without funding resources for long-term maintenance and replacement costs.

Policy 8.4.11: Installation and/or replacement of the recreational facilities and equipment and the bikeway and trail system shall be carried out as part of the City's Capital Improvement Plan.

Natural Resources and Conservation Element

Policy 12.2.3: Pursue voluntary open space or conservation easements to protect sensitive species or their habitats.

Policy 12.3.1: Identify areas and formulate recommendations for the acquisition of property, including funding, to establish a permanent corridor contiguous to the National Forest via Cable Creek and/or Devil Canyon. The City shall consult with various federal, state and local agencies and City departments prior to the adoption of any open space corridor plan.

Policy 12.3.2: Seek to acquire real property rights of open space corridor parcels identified as being suitable for acquisition.

Policy 12.3.3: Establish the following habitat types as high-priority for acquisition as funds are available:

- Habitat of endangered species;
- Alluvial fan scrub vegetation;

- Riparian vegetation dominated by willow, alder, sycamore, or native oaks; and native walnut woodlands

Policy 12.3.4: Preserve and enhance the natural characteristics of the Santa Ana River, City Creek, and Cajon Creek as habitat areas.

Policy 12.3.5: Delineate the habitats of the Santa Ana River Sucker (*Catastomus santaanae*) and Pacific Speckled Dace (*Rhinichthys osculus carringtoni)*; develop recommendations for preservation and enhancement of these habitats; and develop standards for development of adjacent lands.

5.13.3.2 Arrowhead Springs Specific Plan

Development of the Arrowhead Springs Specific Plan would include construction of 21.0 acres of private parkland for future and surrounding area residents. Table 5.13-2 lists future parks that would be provided by the Arrowhead Springs Specific Plan. In addition to private parks, the Arrowhead Springs Specific Plan would also provide for a proposed private trail system restricted to the Arrowhead Springs community. Development of the Arrowhead Springs Specific plan also incorporates 199 acres of the site for an 18-hole public golf course. This golf course would also provide open space areas for active recreation within the planning area. In addition to active open space areas, the Arrowhead Springs Specific Plan would set aside a total of 1,400 acres as open space/watershed. The Specific Plan would take advantage of existing trails and fire roads to provide access to the San Bernardino National Forest.

Table 5.13-2
Proposed Park Facilities in the Arrowhead Springs Specific Plan

Parks	*Acreage*
Botanical Garden	13.9
Village Walk Park	2.2
Fountain Park	0.2
Mudbath Park	0.7
Amphitheater Park	2.9
Oppidan Park	0.3
Hilltown Park	0.8
Total	21.0

AHS IMPACT 5.13-1: INCORPORATION AND SUBSEQUENT BUILDOUT OF THE ARROWHEAD SPRINGS SPECIFIC PLAN WOULD GENERATE ADDITIONAL RESIDENTS THAT WOULD INCREASE THE USE OF EXISTING PARK AND RECREATIONAL FACILITIES WITHIN THE CITY OF SAN BERNARDINO. [THRESHOLD R-1]

Impact Analysis: Annexation and subsequent development of the Arrowhead Springs Specific Plan would create additional demand for park space and increase the use of existing park and recreational facilities within the City of San Bernardino. The anticipated future population of the Arrowhead Springs Specific Plan area would be 4,233 residents, which would result in the need for approximately 21 acres of parkland to satisfy the City requirement for parks in new developments. The closest existing park to the Arrowhead Springs area is 24.2 acre Wildwood Park. This community park could serve the parkland needs of the future residents located within the Arrowhead Springs development causing an increase in the use of this existing park if no parks were built within the development. To satisfy neighborhood demand for parks, the Arrowhead Springs Specific Plan incorporates a total of 21 acres of private parkland available for residents of

the residential community and their guests, which satisfies the City requirement for parkland in the Arrowhead Springs area. Furthermore, the Arrowhead Springs Specific Plan area is nestled in the San Bernardino Mountains, which is a vast resource for passive open space. The Specific Plan alone would provide approximately 1,400 acres of open space much of it adjacent to the San Bernardino National Forest.

AHS IMPACT 5.13-2: BUILDOUT OF THE ARROWHEAD SPRINGS SPECIFIC PLAN AREA WOULD RESULT IN ENVIRONMENTAL IMPACTS TO PROVIDE NEW AND/OR EXPANDED RECREATIONAL FACILITIES. [THRESHOLD R-2]

Impact Analysis: Buildout of the Arrowhead Springs Specific Plan area includes plans and guidelines for future construction of private parkland and trails. Some proposed recreational facilities and trails have the potential to impact sensitive biological areas within San Bernardino Mountains and the Specific Plan area either directly or through improved access and increased use. The Arrowhead Springs Specific Plan also includes 199-acres for the development of a commercial recreational use: The golf course along the drainage of West Twin Creek. Development of the golf course would result in modification of the existing natural environment. Additional discussion on environmental effects of golf course construction can be found in Section 5.3, *Biological Resources* and Section 5.7, *Hydrology*.

5.13.4 Existing Regulations and Standard Conditions

- The City of San Bernardino has implemented a Park and Recreation construction fee on new mobile home and residential dwelling units constructed in the City, as allowed under the Quimby Act. Any person securing a building permit to construct a residential dwelling unit, or install electrical and/or plumbing equipment to provide service to a mobile home shall pay the following rates: (1) one percent of the cost of the improvements for each single family dwelling constructed, as determined by the building permit; (2) one percent of the cost of the improvements for each residential dwelling unit constructed in a multi-family dwelling containing two or more residential dwelling units, as determined by the building permit; or (3) one percent of the cost of the improvements of $650.00 for each mobile home park subdivision, as determined by the building permit. This fee is assessed on new construction or modification of existing structures. Fees are to be paid to the Development Services Department. Fees collected are placed in a special fund known as the Park and Recreation Construction Fee Fund. (Chapter 19.30.320 of the City of San Bernardino Development Code)

- Chapter 19.30.320 of the City of San Bernardino Development Code also allows for credit for land and improvements which are dedicated in fee to public recreation and park purposes, in place of Park and Recreation Construction fees, where a public park or recreational facility has been designated in the General Plan and is to be located in whole or in part within the proposed subdivision and is reasonably related to serving the needs of the residents of that subdivision. Under these conditions, the subdivider shall dedicate land for park and recreational facilities sufficient in size and physical characteristics to meet that purpose. This Chapter of the Development Code also provides for the requirement of land dedication or acceptance of in-lieu fees pursuant to Section 66477 of the State Subdivision Map Act (the Quimby Act). The amount of dedicated land and any conditions are determined by mutual agreement between the City and the dedicator. (Chapter 19.30.320 of the City of San Bernardino Development Code)

5.13.5 Level of Significance Before Mitigation

5.13.5.1 San Bernardino General Plan

Upon implementation of General Plan policies and programs, regulatory requirements, and standard conditions of approval, the following impacts would be less than significant:

GP Impact 5.13-1 Buildout of the San Bernardino General Plan would result in an increased demand for parkland and increased usage of existing parkland within the City of San Bernardino and SOI areas. However, each development within the City would be required to assess their contribution to the need for parkland and pay the appropriate Park and Recreation construction fee or dedicate land as mandated by Section 19.30 of the City of San Bernardino Municipal Code for future acquisition and construction of parkland.

GP Impact 5.13-2 Implementation of the General Plan is not a construction project. Although extension of the multi-use trails and bicycle system may result in impacts to sensitive biological areas within the City, individual projects would be subject to independent review under CEQA to identify potential impacts and provide mitigation if necessary.

5.13.5.2 Arrowhead Springs Specific Plan

Upon implementation of regulatory requirements and standard conditions of approval, the following impacts would be less than significant:

AHS Impact 5.13-1 Annexation and subsequent development of the Arrowhead Springs Specific Plan would increase demand for parkland in the City of San Bernardino. However, the Arrowhead Springs Specific Plan provides for approximately 1,400 acres of passive open space in addition to 21 acres of private parkland for area residents.

The following impacts would be **potentially significant** without mitigation:

AHS Impact5.13-2 Implementation of the Arrowhead Springs Specific Plan would result in improved access to the recreation areas and development of a 199-acre public golf course. Development of the golf course would result in direct impacts to West Twin Creek and its natural biotic community. A discussion these impacts can be found in Section 5.3, *Biological Resources*.

5.13.6 Mitigation Measures

Impacts GP 5.13-1, GP 5.13-2, and AHS 5.13-1 were found to be less than significant and therefore no mitigation measures are required.

AHS 5.13-2 Project applicant shall adhere to mitigation measures (AHS 5.3-1, AHS 5.3-2A, AHS 5.3-2B, AHS 5.3-2C, AHS 5.3-4A, AHS 5.3-4B) as detailed in Section 5.3 which are established to reduce the impact to the biological resources of West Twin Creek.

5.13.7 Level of Significance After Mitigation

Impacts GP 5.13-1, GP 5.13-2 and AHS 5.13-1 were found to be less than significant and would not require mitigation measures. The mitigation measure identified above for Impact AHS 5.3-2 would reduce the one potential impact associated with recreation to a level that is less than significant. Therefore, no significant unavoidable adverse impacts relating to recreation have been identified.

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5.14 TRANSPORTATION AND TRAFFIC

This section of the EIR evaluates traffic and transportation impacts of the General Plan update and the Arrowhead Springs Specific Plan based upon an analysis for each project prepared by Transtech Engineers which can be found in Appendix F of Volume II (General Plan) and Appendix H of Volume III for the Specific Plan.

Standards and Definitions

Level of Service and V/C Ratio

An important "standard" referred to throughout this document relates to the ability of a roadway and/or intersection to accommodate traffic. This level of service standard may be used to describe both existing and future traffic conditions. Level of service (LOS) is a qualitative ranking that characterizes traffic congestion on a scale of A to F with LOS A being a free-flow condition and LOS F representing extreme congestion.

In addition to the LOS definition, a volume to capacity ratio or V/C ratio is used to provide a more quantified description of traffic conditions at intersections. The V/C ratio is the ratio of existing or projected traffic volumes to an intersection's design capacity. A V/C ratio of 0.90 for an intersection means that the traffic volumes at the intersection represent 90 percent of its design capacity. The V/C ratio can also be related to the above LOS definitions. For example, an intersection with a V/C ratio exceeding 0.95 is handling traffic volumes that approach design capacity. The V/C ratio of 0.95 corresponds to LOS E, which indicates an unacceptable level of service at that particular intersection.

The thresholds corresponding to each level of service and V/C ratios for unsignalized and signalized intersections are shown in the following table:

Table 5.14-1
Level of Service and V/C Standards

Level of Service	V/C Ratio (Volume to Capacity)	Two–Way or All–Way Stop Controlled Intersection Average Delay per Vehicle (sec)	Signalized Intersection Average Delay per Vehicle (sec)
A	0.0–0.60	0–10	≤ 10
B	0.61–0.70	> 10–15	> 10–20
C	0.71–0.80	> 15–25	> 20–35
D	0.81–0.90	> 25–35	> 35–55
E	0.91–1.00	> 35–50	> 55–80
F	> 1.00	> 50	> 80 or a V/C ratio equal or greater than 1.0

Source: City of San Bernardino General Plan Update: 2004, Circulation Impact & Mitigation Measures; Transtech Engineers

LOS D is the minimum acceptable threshold at all key intersections in the City of San Bernardino. However, for roadways, the City's minimum threshold is LOS C. The traffic study guidelines require that traffic mitigation measures be identified to provide for operations at the minimum threshold levels.

Roadway Capacity Standards and Passenger Car Equivalents

The following is a list of roadway capacity standards for various types of facilities, used in the roadway capacity analysis for the General Plan:

- 4-lane Major Arterial: 40,000 vehicles per day
- 2-lane Major Arterial: 15,000 vehicles per day
- 4-lane Secondary Arterial: 30,000 vehicles per day
- 2-lane Secondary Arterial: 12,000 vehicles per day
- 4-lane Collector Street: 25,000 vehicles per day
- 2-lane Collector Street: 10,000 vehicles per day

Also, in determining passenger car equivalent (PCE) factors for various trucks, the following factors were used:

- 2-axle Trucks: Equivalent to 2.0 passenger cars
- 3-axle Trucks: Equivalent to 2.5 passenger cars
- 4- or more axle Trucks: Equivalent to 3.0 passenger cars

San Bernardino County Congestion Management Program (CMP)

Proposition 111, passed in June 1990, provided additional transportation funding through a $.09 per gallon increase in the state gas tax. This equates to an estimated annual return of more than $6.25 per person for cities within San Bernardino County, and $7.1 million for the County. Included with the provision for additional transportation funding was a requirement to undertake a Congestion Management Program within each county with an urbanized area of more than 50,000 population, to be developed and adopted by a designated Congestion Management Agency (CMA). Within San Bernardino County, SANBAG was designated the CMA by the County Board of Supervisors and a majority of the cities representing a majority of the incorporated population. CMP Roadways and Intersections in the City are identified throughout this analysis with the “CMP” identifier.

5.14.1 Environmental Setting

5.14.1.1 San Bernardino General Plan

Roadways

The City of San Bernardino has a circulation system consisting of major and secondary arterial roadways, collector roadways, and local streets.

Major Arterials accommodate six or eight travel lanes and may have raised medians. These facilities carry high traffic volumes and are the primary thoroughfares linking San Bernardino with adjacent cities and the regional highway system. Driveway access to these roadways is typically limited to provide efficient high volume traffic flow. Major Arterials include Waterman Avenue, Mount Vernon Avenue, Highland Avenue, and Baseline Street.

Secondary Arterials are typically four-lane streets, providing two lanes in each direction. These highways carry traffic along the perimeters of major developments, provide support to the major arterials, and are also through streets enabling traffic to travel uninterrupted for longer distances through the City. Secondary Arterials Include Little Mountain Drive, 9th Street, Arrowhead Avenue (North of 5th Street), and Sierra Way.

Collector Streets are typically two-lane streets that connect the local streets with the secondary arterials allowing local traffic to access the regional transportation facilities. Collector Streets include California Street, 6th Street, Arrowhead Avenue (north of 30th Street) and Meridian Avenue.

Local Streets are typically two-lane streets that are designed to serve neighborhoods within residential areas. There are several variations on local streets depending on location, length of the street, and type of land use.

Freeways and Highways

Freeways/Highways are controlled-access, separated roadways that provide for high volumes of vehicular traffic at high speeds. There are three freeways within the City of San Bernardino and one State highway:

The San Bernardino Freeway (I-10) is the major east-west freeway providing access west to Los Angeles and east to the desert communities and beyond.

Interstate 215 provides north-south freeway access to Riverside and San Diego counties to the south and the high desert communities to the north.

Interstate 210 provides local east-west service between I-215 and State Route 330 (SR-330). As of 2005, this freeway was under construction and was also known as State Route 30 (SR-30) and will become the future I-210 when completed.

State Route 18 (SR-18) provides a connection from I-210 to the mountain resorts/communities of Lake Gregory.

Rail

San Bernardino includes both major (main line) and minor (spurs) railroads that accommodate both freight and passenger rail services. Both Amtrak and Metrolink provide long-distance passenger train service from the Historic Depot in San Bernardino.

Amtrak trains operate west to Los Angeles; southeast to Palm Springs on to Florida; and northeast to Needles on to Illinois.

Commuter Rail service is provided by the Southern California Regional Rail Authority (SCRRA), which operates the Metrolink train service. The City of San Bernardino is served by the San Bernardino Line, which is Metrolink's busiest line, with a station located at the historic Santa Fe Depot. The San Bernardino Line connects rapidly growing San Bernardino County with the communities of the San Gabriel Valley and downtown Los Angeles. The San Bernardino Line is currently the only line with service seven days a week. On weekdays, there are 15 round trips per day on the San Bernardino Line with about half of them during commute hours, but with close to hourly service in the mid-day.

Transit

Bus Service

Public transportation in the San Bernardino area is provided by Omnitrans, the regional Public Transit operator for San Bernardino County. Omnitrans operates 21 local-fixed routes, 14 of which serve the San Bernardino Planning Area. General service hours are between 6:00 a.m. and 8:00 p.m., Monday through Saturday.

The Southern California Rapid Transit District provides express bus service between San Bernardino-Riverside and Los Angeles (Line 496) under contract with Omnitrans and the Riverside Transit Agency. Service is provided Sunday through Saturday.

Intercity bus service is provided to downtown San Bernardino by Greyhound and Continental Trailways that recently merged. The Greyhound bus depot is at 6th and G Streets.

Omnitrans periodically updates its service plan through the preparation of a Short Range Transit Plan (SRTP), which evaluates service for a five-year period. A SRTP for the years 2004-2009 has recently been adopted and includes some changes in routes within San Bernardino. A current route, schedule, and rate map can be obtained from Omnitrans.

Demand/Response System

Omnitrans provides San Bernardino residents that qualify for service under the Americans with Disabilities Act with a demand/response transportation system known as "Access." A resident may call and request a pick-up and delivery to a requested destination on a space-available basis with a reservation made 24 hours in advance.

Existing Traffic Conditions

This section summarizes the existing circulation conditions in the City of San Bernardino. Eighty intersections, 23 roadway segments and 12 freeway segments were included in the study area for analysis. The analysis is based on the existing amount of traffic volume on various street corridors and the capacity of the streets and intersections to carry traffic. The capacity measures the ability of the street system to meet and serve the demands from traffic. The capacity of a roadway is affected by a number of factors, e.g., the street width, the number of travel lanes, the number of crossing streets, the type of traffic control devices, the presence of on-street parking, the number of access driveways, the streets horizontal and vertical alignments, etc.

For the study area intersections, the TRAFFIX computer software, Version 7.6 has been utilized to determine intersection levels of service. Levels of service are presented for the entire intersection, consistent with the Highway Capacity Manual's Operation Delay (HCM) methodology. While the level of service concepts and analysis methodology provide an indication of the performance of the entire intersection, the single letter grade A through F cannot describe specific operational deficiencies at intersections. Progression, queue formation, and left-turn storage are examples of the operational issues that affect the performance of an intersection, but do not factor into the strict calculation of level of service. However, the TRAFFIX software does provide an output that quantifies operational features at intersections, such as vehicle clearance, queue formation, and left-turn storage requirements.

Existing LOS and V/C Ratios

Existing traffic counts were conducted at various roadway segments and major intersections in 2003 to determine existing V/C and LOS at these facilities. The LOS of roadway segments is based on average daily traffic (ADT) volumes and their traffic handling capacities on a daily basis. The LOS of intersections is based on traffic volumes at the intersections during the AM and PM peak hours and the traffic handling capacity of the intersection's critical lane. Truck trips have been converted to passenger car equivalents (PCE) for consistency of analysis. The results are shown in Table 5.14-2 for intersections and Table 5.14.3 for local roadway segments. CMP intersections and local roadway segments are noted in bold typeface. Intersection peak hour volumes and LOS calculation sheets are shown in Appendix F of Volume II. Most 24-hour volumes were based on existing vehicle classification counts conducted for this study and converted into passenger equivalents (pce) using appropriate factors for various types of trucks. Some volumes were obtained from various sources in pce.

Existing (1999) traffic volume, V/C ratio and LOS for various freeway segments is shown in Table 5.14-4. This information was obtained from the 2003 San Bernardino County CMP Update.

Table 5.14-2
Intersection Level of Service Summary
Existing (2003) Conditions

Intersection	Peak Hour	LOS	Delay sec/veh	V/C Ratio
30th Street @ Lynwood Drive	AM	B	11.3	–
	PM	A	7.2	–
Arden Avenue @ Highland Avenue	AM	D	39.1	0.687
	PM	C	34.2	0.633
Arden Avenue @ SR–30 EB Ramps	AM	B	16.5	0.339
	PM	B	14.2	0.345
Arden Avenue @ SR–30 WB Ramps	AM	A	0	–
	PM	A	0	–
Arrowhead Avenue @ Baseline Street	AM	B	14.7	0.724
	PM	D	38.3	1.043
Belmont Avenue @ Palm Avenue	AM	B	10.1	0.354
	PM	A	8.5	0.232
Boulder Avenue @ Highland Avenue	AM	C	33.8	0.245
	PM	C	34.6	0.490
Del Rosa Avenue @ Baseline Street	AM	C	21.4	0.395
	PM	C	24.7	0.396
Del Rosa Avenue @ Date Street	AM	B	20	0.380
	PM	C	23	0.527
Del Rosa Avenue @ Foothill Drive	AM	B	11.2	–
	PM	B	11.5	–
Del Rosa Avenue @ Lynwood Drive	AM	B	14.8	0.270
	PM	B	13.9	0.339
Del Rosa Avenue @ SR–30 EB Ramp	AM	C	24.4	0.579
	PM	C	29	0.810
Del Rosa Avenue @ SR–30 WB Ramp	AM	C	22.8	0.795
	PM	C	27.4	0.855
Del Rosa Avenue @ Third Street	AM	C	27.5	0.398
	PM	C	31.1	0.469
E Street @ 2nd Street	AM	C	24.3	0.505
	PM	C	34.2	0.576
E Street @ 30th Street	AM	B	14.8	0.476
	PM	B	12.6	0.562
E Street @ Baseline Street	AM	B	18	0.407
	PM	B	19.4	0.566
E Street @ Highland Avenue	AM	B	18.6	0.765
	PM	C	21.7	0.400
E Street @ Orange Show Road	AM	C	27.2	0.423
	PM	D	37.5	0.631
Harrison Street @ 40th Street	AM	B	12.1	–
	PM	B	13.3	–
Hospitality Lane @ Carnegie Drive	AM	C	27	0.536
	PM	D	41.1	0.906
Hunts Lane @ E Street	AM	F	OVL	–
	PM	F	OVL	–
I Street @ 2nd Street	AM	B	14.1	0.189

Table 5.14-2
Intersection Level of Service Summary
Existing (2003) Conditions

Intersection	Peak Hour	LOS	Delay sec/veh	V/C Ratio
	PM	B	13.6	0.221
K Street @ 3rd Street	AM	A	9.8	–
	PM	A	9.3	–
Kendall Drive @ 40th Street	AM	C	21.7	0.169
	PM	C	25.9	0.436
Kendall Drive @ Palm Avenue	AM	C	26.2	0.572
	PM	C	23.9	0.480
Kendall Drive @ University Parkway	AM	C	32.2	0.490
	PM	C	28.6	0.595
Lena Road @ Mill Street	AM	B	18.1	0.178
	PM	B	18	0.206
Leroy/SR–30 WB On-Ramp @ 30th Street	AM	B	17.2	0.598
	PM	B	17.4	0.401
Meridian Avenue @ Rialto Avenue	AM	E	36.3	–
	PM	F	75.1	–
Mt. Vernon Avenue @ Baseline	AM	C	20.1	0.458
	PM	C	23.3	0.532
Mt. Vernon Avenue @ 2nd Street	AM	B	19.8	0.454
	PM	C	30	0.643
Mt.. Vernon Avenue @ 5th Street	AM	C	22.5	0.405
	PM	C	22.5	0.489
Mt. Vernon Avenue @ Highland Avenue	AM	C	27.8	0.617
	PM	C	27.5	0.679
Mt. Vernon Avenue @ Mill Street	AM	C	30.4	0.520
	PM	C	31.7	0.677
Mt. Vernon Avenue @ Rialto Avenue	AM	B	14.5	0.292
	PM	B	14	0.384
Mountain View Avenue @ San Bernardino	AM	B	12.9	0.535
	PM	F	90.2	1.36
Northpark Boulevard @ Fairview Drive	AM	A	9	–
	PM	A	9.6	–
Northpark Boulevard @ Sierra Way	AM	B	10.4	–
	PM	C	16.1	–
Northpark Boulevard @ University Parkway	AM	C	21.4	0.284
	PM	D	39.6	0.689
Ohio Avenue @ Palm Avenue	AM	A	9.9	
	PM	A	9.6	–
Palm Avenue @ Highland Avenue	AM	D	35.8	0.288
	PM	C	32.4	0.520
Pepper Avenue @ Mill Street	AM	C	33.1	0.465
	PM	C	30.4	0.450
Pepper Avenue @ Rialto Avenue	AM	B	14.6	0.366
	PM	B	16.4	0.496
Pepper Avenue @ Valley Boulevard	AM	C	31.2	0.746
	PM	C	31.7	0.755

Table 5.14-2
Intersection Level of Service Summary
Existing (2003) Conditions

Intersection	Peak Hour	LOS	Delay sec/veh	V/C Ratio
Rancho Avenue @ 5th Street/Foothill	AM	F	119.6	–
	PM	F	OVL	–
Sierra Way @ 30th Street	AM	B	15	0.255
	PM	B	15	0.361
Sierra Way @ 40th Street	AM	B	19	0.270
	PM	C	21.3	0.432
SR-30 EB Ramps @ Highland Avenue	AM	D	35.8	0.288
	PM	B	18.5	0.464
SR-30 WB Off-Ramp @ 30th Street	AM	F	298.3	–
	PM	F	946.1	–
SR-30 WB Ramps @ Highland Avenue	AM	B	15.7	0.385
	PM	B	14.2	0.469
State Street @ Baseline Street	AM	B	15.4	0.480
	PM	A	5.5	0.335
State Street @ Highland Avenue	AM	A	8.7	0.499
	PM	A	9.3	0.594
Sterling Avenue @ Foothill Drive	AM	A	7.8	0.156
	PM	A	7.9	0.131
Sterling Avenue @ Highland Avenue	AM	C	29.6	0.328
	PM	A	7.9	0.131
Sterling Avenue @ Lynwood Drive	AM	B	12.5	0.463
	PM	B	12.6	0.437
Tippecanoe Avenue @ 3rd Street	AM	C	26.5	0.464
	PM	C	32.5	0.698
Tippecanoe Avenue @ Harry Shepard	AM	C	22.7	0.482
	PM	C	20.2	0.828
Tippecanoe Avenue @ Hospitality Lane	AM	B	12.2	–
	PM	C	25.3	0.621
Tippecanoe Avenue @ Mill Street	AM	B	13.4	0.454
	PM	C	22.2	0.790
Tippecanoe Avenue @ Rialto Avenue	AM	D	25.6	–
	PM	F	102.6	–
Tippecanoe Avenue @ San Bernardino	AM	C	33.1	0.421
	PM	D	42.1	0.828
Valencia Avenue @ 30th Street	AM	B	14.7	0.233
	PM	B	14.8	0.257
Valencia Avenue @ 40th Street	AM	A	9.9	0.305
	PM	B	11.5	0.412
Victoria Avenue @ Highland Avenue	AM	D	36.1	0.602
	PM	D	39.9	0.683
Waterman Avenue @ 30th Street	AM	C	27.1	0.801
	PM	C	23.4	0.654
Waterman Avenue @ 34th Street	AM	D	26.2	–
	PM	D	29.9	–
Waterman Avenue @ 36th Street	AM	E	37.9	–
	PM	C	23.8	–

Table 5.14-2
Intersection Level of Service Summary
Existing (2003) Conditions

Intersection	Peak Hour	LOS	Delay sec/veh	V/C Ratio
Waterman Avenue @ 40th Street	AM	C	26.1	0.637
	PM	C	24.8	0.506
Waterman Avenue @ Barton Road	AM	C	25.7	0.663
	PM	D	40.3	0.944
Waterman Avenue @ 5th Street	AM	E	63	1.081
	PM	F	256.2	1.593
Waterman Avenue @ Highland Avenue	AM	D	36.4	0.482
	PM	D	39.2	0.650
Waterman Avenue @ Hospitality Lane	AM	C	30.5	0.715
	PM	D	46.8	0.984
Waterman Avenue @ Marshall Boulevard	AM	A	3.2	0.507
	PM	A	4.0	0.451
Waterman Avenue @ Mill Street	AM	C	29.8	0.354
	PM	D	35.2	0.540
Waterman Avenue @ Orange Show Road	AM	C	38	0.425
	PM	D	35.7	0.652
Waterman Avenue @ Parkdale Avenue	AM	B	10.4	0.592
	PM	B	11.1	0.501
Waterman Avenue @ SR-30 EB Ramp	AM	C	32.3	0.852
	PM	F	90.4	1.171
Waterman Avenue @ Vanderbilt Way	AM	B	19.6	0.358
	PM	C	23.3	0.584

As shown in Table 5.14-2, the following intersections are currently operating at an unacceptable LOS, i.e., the LOS at these intersections is worse than LOS D (LOS E or F):

- Hunts Lane @ E Street
- Meridian Avenue @ Rialto Avenue
- Mountain View Avenue @ San Bernardino Avenue
- Rancho Avenue @ 5th Street/Foothill Boulevard
- SR-30 WB Off-Ramp @ 30th Street
- Tippecanoe Avenue @ Rialto Avenue
- Waterman Avenue @ 36th Street
- Waterman Avenue @ 5th Street (CMP intersection)
- Waterman Avenue @ SR-30 EB Ramp (CMP intersection)

Table 5.14-3
Existing 24 Hour Volumes and LOS on Roadway Segments

Location	Date	Dir	2 axle	3 axle	4 axle	5 or more	Total Volume with PCE	No. of Lanes	Facility Type	V/C	LOS
2nd Street: E/O I-215 NB On-Ramp	1/22/2002	EB	11,324	182	16	336	25,136	4	Major	0.63	B
	1/22/2002	WB	10,425	218	45	730	–	–	–	–	
3rd Street: W/O Tippecanoe Avenue	1/22/2002	EB	4,008	65	9	65	8,773	4	Major	0.22	A
	1/22/2002	WB	4,132	43	10	108	–	–	–	–	
5th Street: W/O Mt. Vernon Avenue	1/24/2002	EB	7,626	180	19	130	16,500	4	Major	0.41	A
	1/24/2002	WB	7,459	143	16	214	–	–	–	–	
40th Street: W/O Waterman Avenue	1/22/2002	EB	9,331	193	23	209	18,879	4	Major	0.47	A
	1/22/2002	WB	7,673	119	8	329	–	–	–	–	
Alabama Street: S/O San Bernardino Avenue	1/22/2002	NB	4,569	70	2	322	12,133	4	Major	0.30	A
	1/22/2002	SB	5,174	97	5	528	–	–	–	–	
Baseline Street: W/O Waterman Avenue	1/24/2002	EB	10,647	139	10	353	24,141	4	Major	0.60	A
	1/24/2002	WB	10,886	227	28	440	–	–	–	–	
Boulder Avenue: at Pacific Street	–	–	–	–	–	–	10,910	4	Major	0.27	a
California Street: S/O Lugonia Avenue	1/22/2002	NB	2,405	23	2	71	5,073	4	Secondary	0.17	A
	1/22/2002	SB	2,309	46	2	28	–	–	–	–	
Del Rosa Avenue: N/O Highland Avenue	1/22/2002	NB	9,595	135	15	362	21,158	4	Secondary	0.71	C
	1/22/2002	SB	9,067	148	12	445	–	–	–	–	
E Street: S/O Orange Show Road	1/22/2002	NB	8,217	117	9	326	18,134	4	Major	0.45	A
	1/22/2002	SB	7,912	131	10	312	–	–	–	–	
Highland Avenue: W/O I-215 Freeway	1/24/2002	EB	12,137	198	20	400	26,028	4	Major	0.65	B
	1/24/2002	WB	10,869	201	49	514	–	–	–	–	
Inland Center Drive: E/O I-215 Ramps	1/22/2002	EB	6,015	193	6	236	13,826	4	Major	0.35	A
	1/22/2002	WB	6,277	97	11	190	–	–	–	–	
Kendall Drive: N/O Revere Avenue	2/4/2003	NB	8,372	–	–	–	–	–	–	–	A
	2/4/2003	SB	8,595	–	–	–	–	–	–	–	
Kendall Drive: S/O University Parkway	1/22/2002	NB	9,295	79	5	113	18,752	4	Major	0.47	A
	1/22/2002	SB	8,325	111	7	216	–	–	–	–	
Mill Street: E/O I-215 NB On-Ramp	1/22/2002	EB	7,207	108	12	403	16,179	4	Major	0.40	A
	1/22/2002	WB	6,679	169	18	324	–	–	–	–	
Mount Vernon Avenue: N/O 2nd Street	1/24/2002	NB	8,719	468	79	509	18,026	4	Major	0.45	A
	1/24/2002	SB	6,069	262	20	269	–	–	–	–	

Table 5.14-3
Existing 24 Hour Volumes and LOS on Roadway Segments

Location	Date	Dir	2 axle	3 axle	4 axle	5 or more	Total Volume with PCE	No. of Lanes	Facility Type	V/C	LOS
Mountain View Avenue: S/O Lugonia Avenue	1/22/2002	NB	4,369	47	0	74	8,313	4	Major	0.21	A
	1/22/2002	SB	3,447	65	2	56	–	–	–	–	
Northpark Boulevard: N/O University Parkway	2/4/2003	NB	4,221	–	–	–	8,327	4	Major	0.21	A
	2/4/2003	SB	4,106	–	–	–	–	–	–	–	
Palm Avenue: N/O Pacific Street	–	–	–	–	–	–	9,940	4	Major	0.25	A
Pepper Avenue: S/O Foothill Boulevard	–	–	–	–	–	–	13,600	4	Major	0.34	A
Rancho Avenue: S/O Mill Street	1/24/2002	NB	5,096	42	3	71	10,566	4	Major	0.26	A
	1/24/2002	SB	4,829	39	4	131	–	–	–	–	
Redlands Blvd.: E/O I-10 Freeway Ramp	1/22/2002	EB	4,151	135	18	238	14,554	4	Major	0.36	A
	1/22/2002	WB	8,071	246	12	442	–	–	–	–	
San Bernardino Avenue: E/O Tippecanoe	1/22/2002	EB	4,864	65	5	227	11,200	4	Major	0.28	A
	1/22/2002	WB	5,104	75	1	177	–	–	–	–	
University Parkway: W/O Northpark Boulevard.	2/4/2003	EB	13,761	–	–	–	28,400	4	Major	0.71	C
	2/4/2003	WB	14,639	–	–	–	–	–	–	–	
Tippecanoe Avenue: S/O Hospitality Lane	1/22/2002	NB	14,949	351	38	535	33,387	4	Major	0.83	D
	1/22/2002	SB	13,450	523	48	867	–	–	–	–	
Waterman Avenue: N/O I-10 Freeway	1/22/2002	NB	8,792	355	80	310	22,144	4	Major	0.55	A
	1/22/2002	SB	10,006	200	48	593	–	–	–	–	

Only the following roadway segments shows an unacceptable LOS (i.e., LOS D or worse) based on capacity analysis of 24-hour volumes:

- Tippecanoe Avenue South of Hospitality Lane

The CMP standard for acceptable LOS at intersections and roadway segments is LOS E or better. No local roadway segment falls into this category. The City uses a higher Standard of LOS D as a minimum acceptable service level for intersections and LOS C for roadway segments.

Table 5.14-4
Existing (1999) Freeway Segments Volume/Capacity and LOS

Freeway Segment			Peak Hour	Dir.	Capacity	Existing Conditions		
Freeway	From	To				Volume	V/C	LOS
I-10	Jct. I-215	Waterman Avenue	AM	EB	11,000	7,753	0.705	C
				WB	11,000	10,482	0.953	E
			PM	EB	11,000	10,482	0.953	E
				WB	11,000	7,753	0.705	C
I-10	Waterman Avenue	Tippecanoe Avenue	AM	EB	8,800	6,347	0.721	C
				WB	8,800	8,600	0.977	E
			PM	EB	8,800	8,600	0.977	E
				WB	8,800	6,347	0.721	C
I-10	Tippecanoe Avenue	Mountain View	AM	EB	8,800	6,305	0.716	C
				WB	8,800	8,537	0.970	E
			PM	EB	8,800	8,537	0.970	E
				WB	8,800	6,305	0.716	C
SR-30	Highland Avenue	Jct. I-215	AM	EB	4,400	684	0.155	A
				WB	4,400	842	0.191	A
			PM	EB	4,400	842	0.191	A
				WB	4,400	684	0.155	A
SR-30	Jct. I-215	H Street	AM	EB	4,400	1,421	0.323	A
				WB	4,400	1,737	0.395	A
			PM	EB	4,400	1,737	0.395	A
				WB	4,400	1,421	0.323	A
SR-30	H Street	SR-259	AM	EB	4,400	1,463	0.333	A
				WB	4,400	1,800	0.409	A
			PM	EB	4,400	1,800	0.409	A
				WB	4,400	1,463	0.333	A
SR-30	SR-259	Waterman Avenue	AM	EB	6,600	3,000	0.455	A
				WB	6,600	3,667	0.556	A
			PM	EB	6,600	3,667	0.556	A
				WB	6,600	3,000	0.455	A
SR-30	Waterman Avenue	Del Rosa Drive	AM	EB	6,600	3,000	0.455	A
				WB	6,600	3,667	0.556	A
			PM	EB	6,600	3,667	0.556	A
				WB	6,600	3,000	0.455	A
I-215	Jct. I-10	Orange Show Road	AM	NB	8,800	7,211	0.819	D
				SB	8,800	7,211	0.819	D
			PM	NB	8,800	7,211	0.819	D
				SB	8,800	7,211	0.819	D
I-215	Orange Show Road	Inland Center Drive	AM	NB	8,800	6,789	0.771	C
				SB	8,800	6,789	0.771	C
			PM	NB	8,800	6,789	0.771	C
				SB	8,800	6,789	0.771	C
I-215	Jct. Route 66	Baseline Street	AM	NB	6,600	5,116	0.775	C
				SB	6,600	6,253	0.947	E
			PM	NB	6,600	6,253	0.947	E
				SB	6,600	5,116	0.775	C
I-215	Jct. SR-30	University Parkway	AM	NB	4,400	2,232	0.507	A
				SB	4,400	3,347	0.761	C
			PM	NB	4,400	3,347	0.761	C
				SB	4,400	2,232	0.507	A

Note: Existing volumes are taken from the San Bernardino County CMP, 2003 Update.

All freeway segments are currently operating at the CMP acceptable LOS of E or better.

5.14.1.2 Arrowhead Springs Specific Plan

The existing Arrowhead Springs resort area is accessed from SR-18 (Rim of the World Highway) via Old Waterman Canyon Road and Arrowhead Springs Road. Entrance to the gated private property is restricted to employees and business guests. Old Waterman Canyon Road is a two-lane roadway with access currently restricted to local residents while on-going flood repairs are taking place. All roadways within the Arrowhead Springs property are two-lane.

Existing Traffic Conditions within the Study Area

The traffic study area for potential impacts due to the Arrowhead Springs project was determined to include 8 roadway sections and 14 intersections in San Bernardino south of the Arrowhead Springs property. The analysis of existing conditions is based on the existing amount of traffic volume on various street corridors and the capacity of the streets and intersections to carry traffic. Capacity measures the ability of the street system to meet and serve the demands from traffic. The capacity of a roadway is affected by a number of factors, e.g., the street width, the number of travel lanes, the number of crossing streets, the type of traffic control devices, the presence of on-street parking, the number of access driveways, the streets horizontal and vertical alignments, etc.

Existing LOS and V/C Ratios

Daily traffic (ADT) counts as well as peak hour traffic counts of turn movements were conducted during the months of March and April, 2003 to determine existing traffic volume conditions. The capacity and level of service (LOS) calculations were also conducted for peak hour traffic conditions at these mid-block locations. The TRAFFIX intersection capacity software version 7.6, based on Highway Capacity Manual's Operation Delay methodology was used in intersection LOS calculations. The results are shown in Table 5-14-5 for roadway segments and Table 5.14-6 for intersections. CMP roadway segments are shown in bold type face. No CMP intersections are located in the study area for Arrowhead Springs. Intersection peak hour volumes and LOS calculation sheets are shown in Appendix F of Volume II.

Table 5.14-5
Existing 2003 Average Daily Traffic (ADT) Volumes and LOS on Roadways in the Vicinity of Arrowhead Springs

Roadways	Facility Type	No. of Lanes	Capacity Veh/Day (C)	Existing 2003 Conditions		
				Volume, Veh/Day (V)	V/C Ratio	LOS
Highway 18 N/O Waterman Avenue	Major Arterial	4	40,000	19,194	0.480	A
Waterman Avenue S/O 40th Street	Major Arterial	4	40,000	17,170	0.429	A
Waterman Avenue N/O 30th Street	Major Arterial	4	40,000	21,220	0.531	A
40th Street E/O Waterman Avenue	Major Arterial	4	40,000	10,150	0.254	A
Harrison Street S/O 40th Street	Secondary Arterial	2	12,000	960	0.080	A
Sterling Avenue S/O Foothill Drive	Major Arterial	2	15,000	1,510	0.101	A
Valencia Avenue S/O 40th Street	Secondary Arterial	2	12,000	4,110	0.343	A
Valencia Avenue N/O 30th Street	Secondary Arterial	2	12,000	4,320	0.360	A

Note: Existing ADT volumes were determined based on Caltrans publications, existing 24-hour traffic counts or peak hour traffic counts, assuming that PM peak hour volume represents approx. 10% of ADT volumes.

Table 5.14-6
Existing 2003 Intersection Level of Service Conditions

Intersection	Peak Hour	Existing Conditions		
		LOS	Delay	V/C
Waterman Avenue at 40th Street	AM	C	25.3	0.592
	PM	C	29.3	0.47
Waterman Avenue at Parkdale Drive	AM	B	10.5	0.573
	PM	B	11.3	0.485
Waterman Avenue at 36th Street (Unsignalized)	AM	D	33.6	–
	PM	C	21.6	–
Waterman Avenue at 34th Street (Unsignalized)	AM	D	26.0	–
	PM	D	29.4	–
Waterman Avenue at Marshall Boulevard	AM	A	3.2	0.486
	PM	A	4.0	0.433
Waterman Avenue at 30th Street	AM	C	25.5	0.747
	PM	C	22.9	0.609
Valencia Avenue at 40th Street	AM	B	9.9	0.300
	PM	B	11.3	0.332
Harrison Street at 40th Street (Unsignalized)	AM	B	12.1	–
	PM	B	13.3	–
Del Rosa Avenue at Foothill Boulevard (Unsignalized)	AM	B	11.2	–
	PM	B	11.5	–
Sterling Avenue at Foothill Boulevard	AM	A	7.8	0.156
	PM	A	7.9	0.131
Valencia Avenue at 30th Street	AM	B	14.7	0.231
	PM	B	14.9	0.255
Del Rosa Avenue at Lynwood Drive	AM	B	15.8	0.429
	PM	B	15.3	0.556
Sterling Avenue at Lynwood Drive	AM	B	12.5	0.462
	PM	B	12.6	0.437
30th Street at Lynwood Drive (Unsignalized)	AM	B	13.3	–
	PM	B	14.2	–

Note: V/C ratios are not calculated for unsignalized intersections.

As Tables 5.14-5 and 5.14-6 show, there are no signalized intersections that operate below the acceptable LOS D (i.e., LOS E or F); however, three intersections currently operate at the threshold (LOS D). Similarly, all roadway segments operate above the acceptable LOS C.

5.14.2 Thresholds of Significance

According to Appendix G of the CEQA Guidelines, a project would normally have a significant effect on the environment if the project could:

T-1 Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections).

T-2	Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways.
T-3	Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks.
T-4	Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).
T-5	Result in inadequate emergency access.
T-6	Result in inadequate parking capacity.
T-7	Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks).

The Initial Study, included as Appendix A, Volume II, substantiates that impacts associated with the following thresholds would be less than significant: **T-7**. Therefore, this topic will not be addressed in the following analysis.

A project's traffic impact is determined based upon whether or not traffic volume associated with the project deteriorates the level of service at an intersection location to an unacceptable LOS E or F and for roadway segments below LOS C.

According to the City of San Bernardino Traffic Impact Study Guidelines, traffic impacts at an intersection are to be considered "significant" when any of the following changes in the volume to capacity (V/C) ratios occur between the "without project" and the "with project" conditions:

LOS	*V/C with Project Increases*
C	> 0.0400
D	> 0.0200
E and F	> 0.0100

The LOS and V/C ratios above are based on the delay methodology outlined in the Highway Capacity Manual.

5.14.3 Environmental Impacts

The following impact analysis addresses thresholds of significance for which the Initial Study disclosed potentially significant impacts. The applicable thresholds are identified in parentheses after the impact statement.

5.14.3.1 San Bernardino General Plan

Through the General Plan update, the City has identified a number of roadway improvements, reclassification, and addition/deletion of certain roadway segments in order to improve its circulation conditions to handle existing as well as future traffic volumes. There are approximately 64 changes throughout the City that are proposed as part of the Circulation Element for General Plan, which are listed in Volume II, Appendix F. For the future traffic conditions analysis, these improvements have been assumed to be in place in the circulation system. The proposed *Circulation Plan* for the General Plan update is shown on Figure 5.14-1.

Focused Travel Demand Model

As part of this circulation system analysis, a focused travel demand model was developed to analyze the traffic impacts of projected development within the City, including Arrowhead Springs, at "build-out" of the proposed General Plan. The latest version of the RIVSAN CTP Model, which has a year 2000 base-year and year 2030 as the horizon year, was used. The City and its Sphere of Influence are comprised of approximately 564 traffic analysis zones (TAZs) in this model.

Land use quantities (in acres) were estimated for the build-out conditions for each of the TAZs. These land use quantities were then converted to the number of single and multiple dwelling units, population, retail, and total employment. The CTP model highway network was also obtained from SCAG and refined by adding secondary and collector streets and zonal connectors (per the City's recommended network modification/improvement list) to represent a more detailed network consistent with the finer zone system.

The model input data for the disaggregated TAZs were submitted to SCAG Inland Empire Office. From these data, SCAG generated trips for all study area zones. The EVTM model was run using these new build-out trips in the project area. Trip generation, distribution, and mode choice functions for the model were carried out and the four-period trip tables (AM, PM peak, mid-day and night-time) were provided to the General Plan team. The team performed traffic assignments for all four periods and combined them to generate total daily volumes. These daily trip volumes were assigned to the City of San Bernardino's future planned circulation network with the total trips shown below:

Table 5.14-7
Total Daily Trips at General Plan Buildout

Daily Trips at Build-out	*Proposed General Plan*
From San Bernardino TAZs **to** All SCAG TAZs	793,557
To San Bernardino TAZs **from** All SCAG TAZs	797,888
Total	1,591,445

Source: City of San Bernardino General Plan Update: 2004, Circulation Impact & Mitigation Measures; Transtech Engineers

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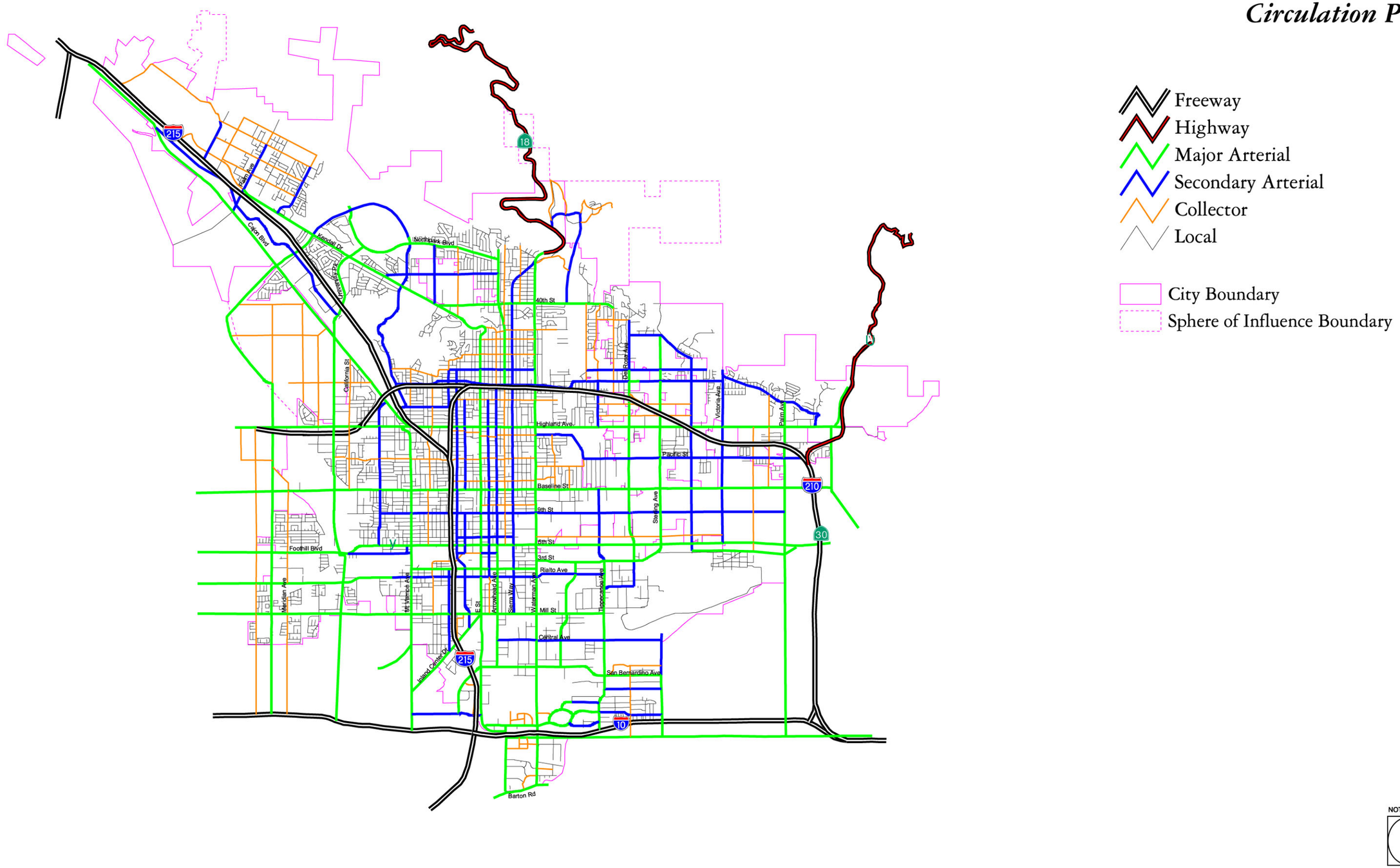
Circulation Plan



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GP IMPACT 5.14-1: TRIP GENERATION AT BUILD-OUT OF THE GENERAL PLAN WOULD IMPACT LEVELS OF SERVICE FOR THE EXISTING AREA ROADWAY SYSTEM. [THRESHOLD T-1]

Impact Analysis: The future build-out traffic conditions within the City were analyzed based on the traffic volume data obtained from EVTM runs. The traffic volume data were post-processed using the "B-Turns" program per SANBAG's requirement. The year 2030 was considered to determine the impacts of the proposed General Plan in comparison with existing conditions.

Tables 5.14-8 and 5.14-9 show the results of intersection and roadway LOS analysis for 2030 under existing conditions and with proposed General Plan. This table shows the roadway segments LOS for 2030 under existing conditions and with the proposed General Plan. The projected volumes were divided by the assumed future capacities to identify the future volume/capacity ratios, LOS, potential future capacity deficiencies and expected congestion problems. Intersection peak hour volumes and LOS calculation sheets are shown in Volume II, Appendix F. CMP intersections are shown in bold typeface in Table 5.14-7. Table 5.14-10 shows the results of the freeway segments analysis with existing conditions and buildout of the General Plan update.

Table 5.14-8
Intersection Level of Service Summary for Future Conditions (2030)

Intersection	Peak Hour	Existing Conditions 2003			Gen. Plan Conditions 2030			G.P. Impact
		LOS	Delay, sec/veh	V/C Ratio	LOS	Delay, sec/veh	V/C Ratio	
30th Street @ Lynwood Drive	AM	B	11.3	–	A	9.7	0	
	PM	A	7.2	–	B	11.5	0	
Arden Avenue @ Highland Avenue	AM	D	39.1	0.687	C	34.9	0.707	
	PM	C	34.2	0.633	D	46.1	0.892	
Arden Avenue @ SR-30 EB Ramps	AM	B	16.5	0.339	B	15.7	0.417	
	PM	B	14.2	0.345	B	18.2	0.583	
Arden Avenue @ SR-30 WB Ramps	AM	0.0	–	–	A	0.0	0.000	
	PM	0.0	–	–	A	0.0	0.000	
Arrowhead Avenue @ Baseline Street	AM	B	14.7	0.724	B	12.6	0.430	
	PM	D	38.3	1.043	B	16.5	0.531	
Belmont Avenue @ Palm Avenue	AM	B	10.1	0.354	A	8.1	0.178	
	PM	A	8.5	0.232	A	7.9	0.147	
Boulder Avenue @ Highland Avenue	AM	C	33.8	0.245	C	25.0	0.320	
	PM	C	34.6	0.490	C	29.3	0.658	
Del Rosa Avenue @ 3rd Street	AM	C	27.5	0.398	D	39.5	0.679	
	PM	C	31.1	0.469	D	47.4	0.839	
Del Rosa Avenue @ Base Line Street	AM	C	21.4	0.395	D	36.2	0.869	
	PM	C	24.7	0.396	C	33.0	0.823	
Del Rosa Avenue @ Foothill Drive	AM	B	11.2	–	B	14.8	–	
	PM	B	11.5	–	C	17.5	–	
Del Rosa Avenue @ Lynwood Drive	AM	B	14.8	0.270	B	16.6	0.558	
	PM	B	13.9	0.339	B	12.7	0.612	
Del Rosa Avenue @ SR-30 EB Ramps	AM	C	24.4	0.579	C	26.5	0.695	
	PM	C	29.0	0.810	C	28.5	0.748	
Del Rosa Avenue @ SR-30 WB Ramps	AM	C	22.8	0.795	B	18.9	0.740	
	PM	C	27.4	0.855	E	57.0	1.088	

Table 5.14-8
Intersection Level of Service Summary for Future Conditions (2030)

Intersection	Peak Hour	Existing Conditions 2003			Gen. Plan Conditions 2030			G.P. Impact
		LOS	Delay, sec/veh	V/C Ratio	LOS	Delay, sec/veh	V/C Ratio	
Del Rosa Avenue @ Dale Street	AM	B	20.0	0.380	B	11.7	0.342	
	PM	C	23.0	0.527	B	12.1	0.465	
E Street @ 2nd Street	AM	C	24.3	0.505	C	29.5	0.654	
	PM	C	34.2	0.576	D	40.3	0.816	
E Street @ 30th Street	AM	B	14.8	0.476	B	15.3	0.449	
	PM	B	12.6	0.562	B	14.8	0.754	
E Street @ Baseline Street	AM	B	18.0	0.407	C	23.1	0.593	
	PM	B	19.4	0.566	C	24.9	0.686	
E Street @ Highland Avenue	AM	B	18.6	0.765	B	16.6	0.428	
	PM	C	21.7	0.400	B	16.5	0.475	
E Street @ Orange Show Road	AM	C	27.2	0.423	C	33.4	0.660	
	PM	D	37.5	0.631	D	49.7	0.945	
Harrison Street @ 40th Street	AM	B	12.1	–	D	26.6	–	
	PM	B	13.3	–	F	OF	–	Yes
Hospitality Lane @ Carnegie Drive	AM	C	27.0	0.536	C	28.9	0.565	
	PM	D	41.1	0.906	C	30.7	0.649	
Hunts Lane @ E Street	AM	F	OVF	–	F	744.5	–	Yes
	PM	F	OVF	–	F	OVF	–	Yes
Kendall Drive @ 40th Street	AM	C	26.2	0.572	B	12.8	0.285	
	PM	C	23.9	0.480	B	18.2	0.542	
Kendall Drive @ Palm Avenue	AM	C	32.2	0.490	B	17.0	0.071	
	PM	C	28.6	0.595	B	17.7	0.072	
Kendall Drive @ University Parkway	AM	C	32.2	0.490	C	30.5	0.513	
	PM	C	28.6	0.595	C	30.6	0.501	
Lena Road @ Mill Street	AM	B	18.1	0.178	C	22.2	0.377	
	PM	B	18.0	0.206	C	22.6	0.502	
Leroy Street/SR-30 WB On-Ramp @ 30th Street	AM	B	17.2	0.598	B	10.2	0.520	
	PM	B	17.4	0.401	B	17.5	0.594	
Meridian Avenue @ Rialto Avenue	AM	E	36.3	–	C	16.5	–	
	PM	F	75.1	–	F	65.6	–	Yes
Mountain View Avenue @ San Bernardino Road	AM	B	12.9	0.535	F	107.1	1.372	Yes
	PM	F	90.2	1.360	F	308.8	2.440	Yes
Mt. Vernon Avenue @ 2nd Street	AM	B	191.8	0.454	B	17.6	0.325	
	PM	C	30.0	0.643	C	31.2	0.682	
Mt. Vernon Avenue @ 5th Street	AM	C	22.5	0.405	C	25.4	0.486	
	PM	C	22.5	0.489	C	24.7	0.611	
Mt. Vernon Avenue @ Base Line Street	AM	C	20.1	0.458	C	22.0	0.527	
	PM	C	23.3	0.532	C	22.8	0.531	
Mt. Vernon Avenue @ Highland Avenue	AM	C	27.8	0.617	C	22.0	0.488	
	PM	C	27.5	0.679	C	31.7	0.598	
Mt. Vernon Avenue @ Mill Street	AM	C	30.4	0.520	C	34.7	0.673	
	PM	C	31.7	0.677	D	35.1	0.799	
Mt. Vernon Avenue @ Rialto Avenue	AM	B	14.5	0.292	B	16.6	0.355	
	PM	B	14	0.384	B	17.0	0.502	

Table 5.14-8
Intersection Level of Service Summary for Future Conditions (2030)

Intersection	Peak Hour	Existing Conditions 2003			Gen. Plan Conditions 2030			G.P. Impact
		LOS	Delay, sec/veh	V/C Ratio	LOS	Delay, sec/veh	V/C Ratio	
Waterman Avenue @ Mill Street	AM	C	28.8	0.354	D	38.6	0.533	
	PM	D	35.2	0.540	D	47.2	0.889	
Northpark Boulevard @ University Parkway	AM	C	21.4	0.284	C	28.0	0.091	
	PM	D	39.6	0.689	C	26.0	0.142	
Ohio Avenue @ Palm Avenue	AM	A	9.9	–	A	9.3	0.000	
	PM	A	9.6	–	A	9.3	0.000	
Palm Avenue @ Highland Avenue	AM	D	35.8	0.288	D	39.7	0.725	
	PM	C	32.4	0.520	D	42.0	0.665	
Pepper Avenue @ Mill Street	AM	C	33.1	0.465	D	37.1	0.525	
	PM	C	30.4	0.450	D	37.2	0.730	
Pepper Avenue @ Rialto Avenue	AM	B	14.6	0.366	B	17.5	0.574	
	PM	B	16.4	0.496	C	20.6	0.728	
Rancho Avenue @ 5th Street/Foothill Boulevard	AM	F	119.6	–	F	OF	0.000	Yes
	PM	F	OVF	–	F	OF	0.000	Yes
SR-30 EB Ramps @ Highland Avenue	AM	D	35.8	0.288	C	20.3	0.600	
	PM	B	18.5	0.464	C	20.8	0.625	
SR-30 WB ramps @ Highland Avenue	AM	B	15.7	0.385	B	13.5	0.317	
	PM	B	14.2	0.469	B	14.5	0.562	
SR-30 WB Off-Ramp @ 30th Street	AM	F	298.3	–	F	465.7	–	Yes
	PM	F	946.1	–	F	OVF	–	Yes
Sterling Avenue @ Foothill Drive	AM	A	7.8	0.156	A	8.1	0.245	
	PM	A	7.9	0.131	B	10.2	0.419	
Sterling Avenue @ Highland Avenue	AM	C	29.6	0.328	C	28.8	0.58	
	PM	A	7.9	0.131	C	31.8	0.606	
Sterling Avenue @ Lynwood Drive	AM	B	12.5	0.463	B	11.2	0.366	
	PM	B	12.6	0.437	C	20.0	0.775	
Sierra Way @ 30th Street	AM	B	15.0	0.255	B	13.9	0.530	
	PM	B	15.0	0.361	B	17.6	0.764	
Sierra Way @ 40th Street	AM	B	19.0	0.270	C	26.0	0.626	
	PM	C	21.3	0.432	C	34.6	0.920	
State Street @ Baseline Street	AM	B	15.4	0.480	B	19.3	0.516	
	PM	A	5.5	0.335	B	19.2	0.560	
State Street @ Highland Avenue	AM	A	8.7	0.499	B	15.2	0.539	
	PM	A	9.3	0.594	B	16.3	0.510	
Tippecanoe Avenue @ Harry Sheppard Boulevard	AM	C	22.7	0.482	A	6.7	0.516	
	PM	C	20.2	0.828	B	11.6	0.683	
Tippecanoe Avenue @ Rialto Avenue	AM	D	25.6	–	F	91.7	0.000	Yes
	PM	F	102.6	–	F	242.1	0.000	Yes
Tippecanoe Avenue @ 3rd Street	AM	C	26.5	0.464	C	30.8	0.573	
	PM	C	32.5	0.698	D	49.0	0.882	
Tippecanoe Avenue @ Hospitality Lane	AM	B	12.2	0.258	B	17.9	0.432	
	PM	C	25.3	0.621	C	24.5	0.505	
Tippecanoe Avenue @ Mill Street	AM	B	13.4	0.454	C	24.0	0.629	
	PM	C	22.2	.0790	B	19.5	0.747	

Table 5.14-8
Intersection Level of Service Summary for Future Conditions (2030)

Intersection	Peak Hour	Existing Conditions 2003			Gen. Plan Conditions 2030			G.P. Impact
		LOS	Delay, sec/veh	V/C Ratio	LOS	Delay, sec/veh	V/C Ratio	
Tippecanoe Avenue @ San Bernardino Road	AM	C	33.1	0.421	D	37.6	0.698	
	PM	D	42.1	0.828	D	48.1	0.863	
Valencia Avenue @ 30th Street	AM	B	14.7	0.233	A	1.0	0.137	
	PM	B	14.8	0.257	B	12.7	0.304	
Valencia Avenue @ 40th Street	AM	A	9.9	0.305	C	15.0	0.667	
	PM	B	11.5	0.412	F	72.4	1.129	Yes
Victoria Avenue @ Highland Avenue	AM	D	36.1	0.602	C	26.0	0.382	
	PM	D	39.9	0.683	C	31.6	0.610	
Waterman Avenue @ 5th Street	AM	E	63	1.081	D	36.6	0.797	
	PM	F	256.2	1.593	D	40.2	0.811	
Waterman Avenue @ 30th Street	AM	C	27.1	0.801	F	138.9	1.215	Yes
	PM	C	23.4	0.654	F	96.5	1.180	Yes
Waterman Avenue @ 34th Street	AM	D	26.2	–	D	26.7	–	
	PM	D	29.9	–	F	110.6	–	Yes
Waterman Avenue @ 36th Street	AM	E	37.9	–	F	54.8	–	Yes
	PM	C	23.8	–	F	87.5	–	Yes
Waterman Avenue @ 40th Street	AM	C	26.1	0.637	C	28.5	0.820	
	PM	C	24.8	0.506	D	42.9	0.982	
Waterman Avenue @ Barton Road	AM	C	25.7	.0663	C	27.7	0.885	
	PM	D	40.3	0.944	C	31.7	0.972	
Waterman Avenue @ Hospitality Lane	AM	C	30.4	0.715	C	30.7	0.637	
	PM	D	46.8	0.984	C	33.4	0.762	
Waterman Avenue @ Marshall Boulevard	AM	A	3.2	0.507	A	4.6	0.626	
	PM	A	4.0	0.451	A	5.0	0.633	
Waterman Avenue @ Parkdale Avenue	AM	B	10.4	0.592	A	3.7	0.553	
	PM	B	11.1	0.501	A	5.3	0.651	
Waterman Avenue @ Orange Show Road	AM	C	38.0	0.442	D	35.1	0.648	
	PM	D	35.7	0.652	D	40.1	0.832	
Waterman Avenue @ SR-30 EB Ramps	AM	C	32.3	0.852	E	60.9	1.053	Yes
	PM	F	90.4	1.171	F	127.9	1.288	Yes
Waterman Avenue @ Vanderbilt Way	AM	B	19.6	0.358	B	10.3	0.391	
	PM	C	23.3	0.584	B	13.7	0.641	
Waterman Avenue @ Highland Avenue	AM	D	36.4	0.482	D	37.3	0.628	
	PM	D	39.2	0.650	D	40.0	0.707	

As shown on the preceding table, the following 12 intersections are expected to perform at an unacceptable level of service at build-out of the General Plan:

- Harrison Street @ 40th Street
- Hunts Lane @ E Street
- Meridian Avenue @ Rialto Avenue
- Mountain View @ San Bernardino Road
- Rancho Avenue @ 5th Street/Foothill Boulevard

- SR-30 WB Off-ramp @ 30th Street
- Tippecanoe Avenue @ Rialto Avenue
- Valencia Avenue @ 40th Street
- Waterman Avenue @ 30th Street
- Waterman Avenue @ SR-30 EB Ramps
- Waterman Avenue @ 34th Street
- Waterman Avenue @ 36th Street

Table 5.14-9 shows the future local roadway segment conditions at build-out of the proposed General Plan.

Table 5.14-9
Future Roadway LOS with Proposed General Plan Volumes

Roadway	Segment	CMP Street (Y/N)?	FUTURE CONDITIONS WITH PROPOSED GP						
			Facility Type	No. of Lanes	Capacity (C)	Build-out ADT (V)	V/C	LOS	Mitigation Required?
East-West Streets									
2ND Street	E/O I-215 NB On Ramp	Y	Major	6	60,000	19,608	0.323	A	
3rd Street	W/O Tippecanoe	Y	Major	4	40,000	25842	0.671	C	
4th Street	I-215–Arrowhead	N	Major	4	40,000	24,633	0.616	B	
5th Street	Pepper–I-215	N	Major	4	40,000	19,238	0.481	A	
5th Street	I-215–Waterman	N	Major	4	40,000	24,007	0.600	A	
5th Street	Waterman–Victoria	Y	Major	4	40,000	17,878	0.447	A	
5th Street	Victoria–Palm	Y	Major	4	40,000	14,370	0.359	A	
9th Street	Medical Center–I-215	N	Secondary	4	30,000	5,219	0.174	A	
9th Street	I-215–Waterman	N	Secondary	4	30,000	8,367	0.279	A	
9th Street	Waterman–Tippecanoe	N	Secondary	4	30,000	5,927	0.198	A	
9th Street	Tippecanoe–Del Rosa	N	Secondary	2	12,000	5,712	0.476	A	
40th Street	Valencia–Waterman	N	Major	4	40,000	17,908	0.448	A	
40th Street	Waterman–Sierra	Y	Major	4	40,000	22,625	0.566	A	
40th Street	Sierra–Mountain View	Y	Major	4	40,000	31,279	0.782	C	
Baseline Street	SR-30–Palm	Y	Major	4	40,000	25,185	0.630	B	
Baseline Street	Palm–Valencia	Y	Major	4	40,000	34,286	0.857	D	Yes
Baseline Street	Valencia–I-215	Y	Major	4	40,000	23,585	0.590	A	
Baseline Street	I-215–Riverside	Y	Major	4	40,000	18,194	0.455	A	
Highland Ave.	Riverside–I-215	Y	Major	4	40,000	8,447	0.211	A	
Highland Ave.	I-215–Victoria	Y	Major	4	40,000	26,775	0.669	B	
Highland Ave.	Victoria–SR-30	Y	Major	4	40,000	27,788	0.695	B	
Highland Ave.	SR-30–E. City Limit	N	Major	4	40,000	23,666	0.592	A	
Hospitality Lane	E Street–Hunts	N	Secondary	4	30,000	13,972	0.466	A	
Hospitality Lane	Hunts–Waterman	N	Secondary	4	30,000	18,460	0.615	B	
Inland Center Dr.	E/O I-215 Ramps	N	Major	4	40,000	11,861	0.296	A	
Mill Street	Tippecanoe–Waterman	N	Major	4	40,000	19,150	0.479	A	
Mill Street	Waterman–Mt Vernon	Y	Major	4	40,000	30,155	0.754	C	
Mill Street	Mt Vernon–Bordwell	Y	Major	4	40,000	31,126	0.778	C	
Redlands Blvd.	I-215–Waterman	Y	Secondary	4	30,000	18,011	0.600	A	
Rialto Ave.	Riverside–Rancho	N	Major	4	40,000	16,287	0.407	A	
Rialto Ave.	Rancho–I Street	N	Major	4	40,000	16,970	0.424	A	
Rialto Ave.	I St–Sierra	N	Major	4	40,000	8,628	0.216	A	

Table 5.14-9
Future Roadway LOS with Proposed General Plan Volumes

Roadway	Segment	CMP Street (Y/N)?	FUTURE CONDITIONS WITH PROPOSED GP						
			Facility Type	No. of Lanes	Capacity (C)	Build-out ADT (V)	V/C	LOS	Mitigation Required?
Rialto Ave.	Sierra–Tippecanoe	N	Major	4	40,000	7,688	0.192	A	
San Bernardino road	E/O Tippecanoe	Y	Major	4	40,000	16,742	0.419	A	
North-South Streets									
Alabama Street	S/O San Bernardino	Y	Major	4	40,000	19,463	0.419	A	
Boulder Ave.	Atlantic–Pacific	N	Major	4	40,000	14,853	0.371	A	
California Street	S/O Lugonia	Y	Major	6	60,000	14,691	0.245	A	
Del Rosa Drive	3rd St–Paloma	Y	Secondary	4	30,000	14,877	0.496	A	
Del Rosa Drive	Baseline–SR-30	Y	Secondary	4	30,000	21,995	0.733	C	
Del Rosa Drive	SR-30–Quail Canyon	N	Secondary	4	30,000	1,445	0.048	A	
E Street	I-10- Fairway	Y	Major	4	40,000	23,208	0.580	A	
E Street	Fairway–9th Street	Y	Major	4	40,000	18,814	0.470	A	
E Street	9th St–Kendall	Y	Major	4	40,000	35,103	0.878	D	Yes
Kendall Drive	S/O University Pkwy.	Y	Major	4	40,000	18,915	0.473	A	
Kendall Drive	N/O Revere	N	Major	4	40,000	13,142	0.328	A	
Mountain View Ave.	S/o Lugonia	Y	Major	4	40,000	16,962	0.424	A	
Mount Vernon Ave.	N/O 2nd Street	Y	Major	4	40,000	13,052	0.326	A	
Northpark Blvd.	N/O University Pkwy	N	Major	6	60,000	3,273	0.055	A	
Palm Ave.	Pacific–Highland	Y	Major	4	40,000	19,826	0.496	A	
Pepper Ave.	I-10–Foothill	Y	Major	4	40,000	44,034	1.101	F	Yes
Rancho Ave.	I-10–Mill	Y	Major	4	40,000	21,870	0.547	A	
Rancho Ave.	Mill–Rialto	Y	Major	4	40,000	23,685	0.592	A	
Rancho Ave.	Rialto–Foothill	Y	Major	4	40,000	20,783	0.520	A	
Sierra Way	Waterman–40th Street	N	Major	4	40,000	37,828	0.946	E	Yes
Sierra Way	40th Street–5th Street	N	Major	2	15,000	2,112	0.141	A	
Sierra Way	5th Street–2nd Street	N	Major	4	40,000	5,505	0.138	A	
Sierra Way	2nd Street–Mill	N	Major	4	40,000	5,789	0.145	A	
Tippeecanoe	S/O Hospitality Lane	Y	Major	6	60,000	32,065	0.534	A	
University Pkwy.	W/O Northpark Blvd.	N	Major	6	60,000	7,834	0.131	A	
Victoria Ave.	Lynwood–Baseline	N	Secondary	4	30,000	9,412	0.314	A	
Victoria Ave.	Baseline–3rd Street	Y	Secondary	4	30,000	6,158	0.205	A	
Waterman Ave.	I-10–Highland	Y	Major	6	60,000	26,590	0.443	A	
Waterman Ave.	Highland–Sierra	Y/N	Major	4	40,000	24,062	0.602	A	

As shown on the preceding table, the following 4 roadway segments are expected to perform at an unacceptable level of service (LOS D or worse) at build-out of the General Plan according to standards established by the City:

- Baseline Street between Palm Avenue and Valencia Avenue
- E Street between 9th Street and Kendall Drive
- Pepper Avenue between I-10 and Foothill Boulevard
- Sierra Way between Waterman Avenue and 40th Street

Table 5.14-10
Future (2030) Freeway Segments Volume/Capacity and LOS

Freeway Segment			Peak Hour	Dir.	Existing Conditions			2030 With GP Update			Mitigation Required	2030 Post-Mitigation		
Freeway	From	To			Volume	V/C	LOS	Volume	V/C	LOS		Capacity	V/C	LOS
I-10	Jct. I-215	Waterman Avenue	AM	EB	7,753	0.705	C	11,225	1.020	F	Add 2 lanes	15,400	0.729	C
				WB	10,482	0.953	E	9,753	0.887	D	None	–	–	–
			PM	EB	10,482	0.953	E	13,682	1.244	F	Add 2 lanes	15,400	0.888	D
				WB	7,753	0.705	C	11,918	1.083	F	Add 1 lane	13,200	0.903	E
I-10	Waterman Ave.	Tippecanoe Ave.	AM	EB	6,347	0.721	C	8,654	0.983	E	None	–	–	–
				WB	8,600	0.977	E	10,655	1.211	F	Add 2 lanes	13,200	0.807	D
			PM	EB	8,600	0.977	E	12,314	1.399	F	Add 2 lanes	13,200	0.933	E
				WB	6,347	0.721	C	11,479	1.304	F	Add 2 lanes	13,200	0.870	D
I-10	Tippecanoe Ave.	Mountain View	AM	EB	6,305	0.716	C	6,965	0.791	C	None	–	–	–
				WB	8,537	0.970	E	10,726	1.219	F	Add 2 lanes	13,200	0.813	D
			PM	EB	8,537	0.970	E	12,212	1.388	F	Add 2 lanes	13,200	0.925	E
				WB	6,305	0.716	C	10,545	1.198	F	Add 2 lanes	13,200	0.799	C
SR-30	Highland Ave.	Jct. I-215	AM	EB	684	0.155	A	4,707	1.070	F	Add 2 lanes	8,800	0.535	A
				WB	842	0.191	A	4,732	1.075	F	Add 1 lane	6,600	0.717	C
			PM	EB	842	0.191	A	7,108	1.615	F	Add 2 lanes	8,800	0.808	D
				WB	684	0.155	A	6,414	1.458	F	Add 1 lane	6,600	0.972	E
SR-30	Jct. I-215	H Street	AM	EB	1,421	0.323	A	3,560	0.809	D	None	–	–	–
				WB	1,737	0.395	A	5,216	1.185	F	Add 1 lane	6,600	0.790	C
			PM	EB	1,737	0.395	A	6,451	1.466	F	Add 1 lane	6,600	0.977	E
				WB	1,421	0.323	A	6,025	1.369	F	Add lane	6,600	0.913	E
SR-30	H Street	SR-259	AM	EB	1,463	0.333	A	3,560	0.809	D	None	–	–	–
				WB	1,800	0.409	A	5,216	1.185	F	Add 1 lane	6,600	0.790	C
			PM	EB	1,800	0.409	A	6,451	1.466	F	Add 1 lane	6,600	0.977	E
				WB	1,463	0.333	A	6,025	1.369	F	Add 1 lane	6,600	0.913	E
SR-30	SR-259	Waterman Ave.	AM	EB	3,000	0.455	A	3,973	0.602	B	None	–	–	–
				WB	3,667	0.556	A	5,897	0.893	D	None	–	–	–
			PM	EB	3,667	0.556	A	7,060	1.070	F	Add 1 lane	8,800	0.802	D
				WB	3,000	0.455	A	6,501	0.985	E	None	–	–	–
SR- 30	Waterman Ave.	Del Rosa Drive	AM	EB	3,000	0.455	A	4,082	0.618	B	None	–	–	–
				WB	3,667	0.556	A	4,798	0.727	C	None	–	–	–
			PM	EB	3,667	0.556	A	6,476	0.981	E	None	–	–	–
				WB	3,000	0.455	A	5,873	0.890	D	None	–	–	–

Table 5.14-10
Future (2030) Freeway Segments Volume/Capacity and LOS

Freeway Segment			Peak Hour	Dir.	Existing Conditions			2030 With GP Update			Mitigation Required	2030 Post-Mitigation		
Freeway	From	To			Volume	V/C	LOS	Volume	V/C	LOS		Capacity	V/C	LOS
I-215	Jct. I-10	Orange Show Road	AM	NB	7,211	0.819	D	6,256	0.711	C	None	–	–	–
				SB	7,211	0.819	D	8,946	1.017	F	Add 1 lane	11,000	0.813	D
			PM	NB	7,211	0.819	D	10,312	1.172	F	Add 1 lane	11,000	0.937	E
				SB	7,211	0.819	D	8,545	0.971	E	None	–	–	–
I-215	Orange Show Road	Inland Center Drive	AM	NB	6,789	0.771	C	4,996	0.568	A	None	–	–	–
				SB	6,789	0.771	C	8,762	0.996	E	None	–	–	–
			PM	NB	6,789	0.771	C	8,576	0.975	E	None	–	–	–
				SB	6,789	0.771	C	6,643	0.755	C	None	–	–	–
I-215	Jct. Route 66	Baseline Street	AM	NB	5,116	0.775	C	4,134	0.626	B	None	–	–	–
				SB	6,253	0.947	E	10,194	1.545	F	Add 2 lanes	11,000	0.927	E
			PM	NB	6,253	0.947	E	11,693	1.772	F	Add 3 lanes	13,200	0.886	D
				SB	5,116	0.775	C	8,242	1.249	F	Add 2 lanes	11,000	0.749	C
I-215	Jct. SR-30	University Parkway	AM	NB	2,232	0.507	A	2,003	0.455	B	None	–	–	–
				SB	3,347	0.761	C	4,633	1.053	F	Add 1 lane	6,600	0.702	C
			PM	NB	3,347	0.761	C	5,127	1.165	F	Add 1 lane	6,600	0.777	C
				SB	2,232	0.507	A	3,122	0.710	C	None	–	–	–

Notes:
– 2030 Base volumes are taken from 2030 Base ADT model runs and by multiplying ADT volumes by a factor of 0.10 peak hour volume to ADT ratio.
– 2030 with GP Update volumes are taken from 2030 AM and PM peak hour model runs and by post-processing with a 0.38 AM peak hourly to peak period factor and a 0.28 PM peak hourly to peak period factor
– Capacity for each lane is 2,200 vphpl per CMP guidelines.

As can be seen from the preceding table a number of freeway segments would be affected by the buildout of the General Plan Update.

GP IMPACT 5.14-2: ***GENERAL PLAN RELATED TRIP GENERATION IN COMBINATION WITH EXISTING AND PROPOSED CUMULATIVE DEVELOPMENT WOULD RESULT IN DESIGNATED INTERSECTIONS, ROAD AND/OR HIGHWAYS EXCEEDING COUNTY CONGESTION MANAGEMENT AGENCY SERVICE STANDARDS. [THRESHOLD T-2]***

Impact Analysis: The CMP intersections and roadway segments have been noted in GP Impact 5.14-1. Table 5.14-8 indicates that only one CMP intersection would not meet an acceptable LOS of E or better: Waterman Avenue @ SR-30 EB ramps. Table 5.14-9 indicates that one CMP roadway segment (Pepper Avenue between I-10 and Foothill) would function at an unacceptable LOS F and several freeway segments would function at an unacceptable LOS F as indicated in Table 5.14-10.

GP IMPACT 5.14-3: ***THE PROPOSED GENERAL PLAN WOULD NOT CHANGE AIR TRAFFIC PATTERNS THAT WOULD RESULT IN SUBSTANTIAL SAFETY RISKS. [THRESHOLD T-3]***

Impact Analysis: As discussed in Section 5.8, *Land Use and Planning*, the proposed General Plan will incorporate the Airport Master Plan and the Comprehensive Land Use Plan (CLUP) for the San Bernardino International Airport (SBIA). Please note that as of the writing of this report, the CLUP for SBIAA were in the process of being prepared and the Airport was operating under an Interim Airport Operating Plan. As a consequence, the precise noise contours and safety zones were not available. However, relative policies have been included in the General Plan. In addition, the Airport Land Use Compatibility Plan for the SBIA was not available for use in this Plan. Upon adoption of the Airport Master Plan and CLUP, the new noise and safety zones will be incorporated into the General Plan and the Airport Land Use Compatibility Plan analyzed for relative information.

GP IMPACT 5.14-4: ***PROJECT CIRCULATION IMPROVEMENTS HAVE BEEN DESIGNED TO ADEQUATELY ADDRESS POTENTIALLY HAZARDOUS CONDITIONS (SHARP CURVES, ETC), POTENTIAL CONFLICTING USES, AND EMERGENCY ACCESS. [THRESHOLDS T-4 AND T-5]***

Impact Analysis: The proposed Circulation Element of the General Plan includes several changes in roadway classifications and alignments. These changes are intended to address issues of capacity, access, and safety and are detailed in Appendix F. With one exception (Harrison Parkway), the changes to the General Plan circulation system are only depicted at a policy level to show classification and general alignment. When the roadways are designed, they will comply with City and/or Caltrans standards for design, sight lines, access, speeds, and emergency access.

GP IMPACT 5.15-5: ***ADEQUATE PARKING WOULD BE PROVIDED WITH IMPLEMENTATION OF THE GENERAL PLAN UPDATE. [THRESHOLD T-6]***

Impact Analysis: The proposed General Plan update does not fundamentally change the current land use patterns but does encourage improvement in quality of life which may include revitalization of some areas and the introduction of infill development. It also stresses pedestrian friendly development with use of mass transit which could reduce the need for abundant parking. The General Plan update includes goals and polices to achieve balance between parking and demand. New developments would be required to provide adequate parking to meet the parking demand generated.

General Plan Policies and Programs

Land Use Element

Proposed General Plan policies related to the provision/accommodation of alternative transportation options:

Policy 2.2.5: Establish and maintain an ongoing liaison with Caltrans, the railroads, and other agencies to help minimize impacts and improve aesthetics of their facilities and operations; including possible noise walls, berms, limitation on hours and types of operations, landscaped setbacks and decorative walls along its periphery.

Proposed General Plan policies related to general circulation issues:

Policy 2.3.6: Circulation system improvements shall continue to be pursued that facilitate connectivity across freeway and rail corridors.

Policy 2.3.7: Improvements shall be made to transportation corridors that promote physical connectivity and reflect consistently high aesthetic values.

Policy 2.7.4: Reserve lands for the continuation and expansion of public streets and highways in accordance with the Master Plan of Highways.

Proposed General Plan policies related to air traffic:

Policy 2.9.1: Require that all new development be consistent with the adopted Comprehensive Land Use Plan for the San Bernardino International Airport and ensure that no structures or activities encroach upon or adversely affect the use of navigable airspace.

Policy 2.9.2: Refer any adoption or amendment of this General Plan, specific plan, zoning ordinance, or building regulation within the planning boundary of the adopted Comprehensive Airport Master Plan for the SBIA to the airport authority as provided by the Airport Land Use Law.

Policy 2.9.3: Limit the type of development, population density, maximum site coverage, and height of structures as specified in the applicable safety zones in the Comprehensive Land Use Plan for the SBIA and as shown on Figure LU-4.

Policy 2.9.4: Limit the development of sensitive land uses (e.g., residential, hospitals, schools) within the 65 decibel (dB) Community Noise Equivalent Level (CNEL) contour, as shown on Figure LU-4.

Policy 2.9.5: Ensure that the height of structures do not impact navigable airspace, as defined in the Comprehensive Land Use Plan for the SBIA.

Policy 2.9.6: As required by State Law for real estate transactions within the Airport Influence Area, as shown on Figure LU-4, require notification/disclosure statements to alert potential buyers and tenants of the presence of and potential impacts from the San Bernardino International Airport.

Circulation Element

Proposed General Plan policies related to design of roadways, safety, and the elimination/mitigation of impacts:

Policy 6.3.3: Require that all City streets be constructed in accordance with the Circulation Plan (Figure C-2) and the standards established by the Development Services Director.

Policy 6.3.4: Require appropriate right-of-way dedications of all new developments to facilitate construction of roadways shown on the Circulation Plan.

Policy 6.3.5: Limit direct access from adjacent private properties to arterials to maintain an efficient and desirable quality of traffic flow.

Policy 6.3.6: Locate new development and their access points in such a way that traffic is not encouraged to utilize local residential streets and alleys.

Policy 6.3.7: Require that adequate access be provided to all developments in the City including secondary access to facilitate emergency access and egress

Proposed General Plan policies related to mass transit and rail:

Policy 6.6.1: Support the efforts of regional, state, and federal agencies to provide additional local and express bus service in the City.

Policy 6.6.2: Create a partnership with Omnitrans to identify public transportation infrastructure needs that improve mobility.

Policy 6.6.3: In cooperation with Omnitrans, require new development to provide transit facilities, such as bus shelters and turnouts, as necessary and warranted by the scale of the development.

Policy 6.6.4: Ensure accessibility to public transportation for seniors and persons with disabilities.

Policy 6.6.5: In cooperation with Omnitrans, explore methods to improve the use, speed, and efficiency for transit services. These methods might include dedicated or priority lanes/signals, reduced parking standards for selected core areas, and incorporating Intelligent Transportation System architecture.

Policy 6.6.6: Support and encourage the provision of a range of paratransit opportunities to complement bus and rail service for specialized transit needs.

Policy 6.6.7 Encourage measures that will reduce the number of vehicle-miles traveled during peak periods, including the following examples of these types of measures:

- Incentives for car-pooling and vanpooling.
- Preferential parking for car-pools and vanpools.
- Conveniently located bus stops with shelters.
- An adequate, safe, and interconnected system of pedestrian and bicycle paths

Policy 6.6.8: Promote the use of car-pools and vanpools by providing safe, convenient park-and-ride facilities.

Policy 6.7.1: Accommodate railroad services that allow for the movement of people and goods while minimizing their impact on adjacent land uses.

Policy 6.7.2: Coordinate with SANBAG, SCAG, the County and other regional, state or federal agencies and the railroads regarding plans for the provision of passenger, commuter, and high-speed rail service.

Policy 6.7.3: Encourage the provision of a buffer between residential land uses and railway facilities and encourage the construction of sound walls or other mitigating noise barriers between railway facilities and adjacent land uses.

Policy 6.7.4: Identify existing and future high volume at-grade railroad crossings and pursue available sources of funding (e.g., California Public Utilities Commission) to implement grade separations where appropriate.

General Plan policies relating to parking:

Policy 6.9.1: Ensure that developments provide an adequate supply of parking to meet the needs, on-site or within close proximity to the developments generating the demand for parking.

Policy 6.9.2: Study the parking standards in the Development Code to determine if they accurately reflect demand and if adequate flexibility is available to accommodate certain situations, such as shared parking, senior housing, or transit oriented developments.

Policy 6.9.3: Require that all new developments provide adequate parking to meet their parking demands on-site or in consolidated parking facilities within close proximity to their site, except for developments within the Central City Parking District.

Policy 6.9.4: Continue to expand the supply of public parking in off-street parking facilities in downtown San Bernardino.

Policy 6.9.5: Continue to provide an in-lieu parking fee option for developments in the downtown area to satisfy all or part of their parking requirement through the payment of an in-lieu fee which will be utilized to provide parking in consolidated public parking facilities.

Policy 6.9.6: Require that new developments submit a parking demand analysis to the City Engineer for review and approval whenever a proposal is made to provide less than the full code requirement of parking for each individual land use on-site at the proposed development.

Policy 6.9.7: Consider all concepts relating to joint use, shared parking, and off-peak demand to maximize the utilization of existing and proposed parking in the Central Business District.

Policy 6.9.8: Develop parking and traffic control plans for those neighborhoods adversely impacted by spillover parking and traffic.

5.14.3.2 Arrowhead Springs Specific Plan

The traffic analysis for the Arrowhead Springs Specific Plan was calculated for two phases of development. Phase one was assumed to be completed by the year 2007, prior to construction of the secondary access shown on figures as (Arrowhead Springs) Village Parkway or improvements to Harrison Boulevard. Until construction of Village Parkway, traffic to/from Arrowhead Springs would use the existing external circulation network by accessing the development from SR-18. Within Arrowhead Springs, site-specific roadway and intersection improvements would be completed based on project-related impacts expected with Phase one traffic volumes. Therefore, roadway and intersection traffic analysis was conducted separately for Phase one development and the 2030 build-out development, which includes completion of Village Parkway. This analysis is very conservative in that development included in Phase I for the traffic analysis would in fact take longer than the year 2007.

AHS IMPACT 5.15-1: PROJECT-RELATED TRIP GENERATION WOULD IMPACT LEVELS OF SERVICE FOR THE EXISTING AREA ROADWAY SYSTEM. [THRESHOLD T-1]

Impact Analysis: At build-out, the Arrowhead Springs Specific Plan is expected to generate approximately 24,412 new vehicular trips per day on an average weekday, of which approximately 1,329 trips would be during the AM commuter peak hour (one hour between 7 a.m. and 9 a.m.) and 2,075 trips will be during the PM commuter peak hour (one hour between 4:00 p.m. and 6:00 p.m.). These estimates are based on the proposed land uses for the Arrowhead Springs development and trip generation rates for these land uses published by the Institute of Transportation Engineers (ITE, 2004) and other applicable trip generation data and information. Table 5.14-11 shows traffic generation estimates for the Arrowhead Springs development.

Table 5.14-11
Trip Generation by Arrowhead Springs Development at Phase I And Full Project Build-Out

Land Use & ITE Code	Size & Unit	Traffic Composition		Rates & Vol	Average Daily Traffic Volume			AM Peak Hour Traffic Volume			PM Peak Hour Traffic Volume		
		Type	%		Total	IN	OUT	Total	IN	OUT	Total	IN	OUT
PHASE I													
1a. Hotel and Spa (330)*:	193	Cars & Trucks	100%	Rate	8.00	50%	50%	0.37	72%	28%	0.49	43%	57%
Conf.Ctr./Bungalows/Spa	Room			Vol	1,544	772	772	71	51	20	95	41	54
1b. Hotel (330):	115	Cars & Trucks	100%	Rate	8.00	50%	50%	0.37	72%	28%	0.49	43%	57%
Annex	Room			Vol	920	460	460	43	31	12	56	24	32
3a. Condo (230):	285	Cars & Trucks	100%	Rate	5.86	50%	50%	0.44	17%	83%	0.54	67%	33%
Townhomes/ Hilltown	DU			Vol	1,670	835	835	125	21	104	154	103	51
3b. Commercial (820):		Cars & Trucks	100%	Rate	42.92	50%	50%	1.03	61%	39%	3.74	48%	52%
Golf-related:22,000 sf	34,167			Vol	1,466	733	733	35	21	14	128	61	66
Chapel*: 1,500 sf	GSF	Pass-By Trips	34%	Rate	14.59	50%	50%	0.35	61%	39%	1.27	48%	52%
Spring House*: 2,667 sf				Vol	499	249	249	12	7	5	43	21	23
Hilltown Shops: 8,000 sf		Net Trips			968	484	484	23	14	9	84	40	44
4. Golf Course (430)	199	Cars & Trucks	100%	Rate	5.04	50%	50%	0.21	74%	26%	0.30	34%	66%
	Acre			Vol	1,003	501	501	42	31	11	60	20	39
5a. Estate Homes (210):	24	Cars & Trucks	100%	Rate	9.57	50%	50%	0.75	25%	75%	1.01	64%	36%
Res. North	DU			Vol	230	115	115	18	5	14	24	16	9
6a. Estate Homes (210):	12	Cars & Trucks	100%	Rate	9.57	50%	50%	0.75	25%	75%	1.01	64%	36%
Res. South	DU			Vol	115	57	57	9	2	7	12	8	4
6b. Senior Housing (253)	300	Cars & Trucks	100%	Rate	3.48	50%	50%	0.07	63%	37%	0.10	59%	41%
	DU			Vol	1,044	522	522	21	13	8	30	18	12
PHASE II													
5b. Condo (230):	429	Cars & Trucks	100%	Rate	5.86	50%	50%	0.44	17%	83%	0.54	67%	33%
Townhomes/ Res. North	DU			Vol	2,514	1,257	1,257	189	32	157	232	155	76
7. Hotel (330):	300	Cars & Trucks	100%	Rate	8.00	50%	50%	0.37	72%	28%	0.49	43%	57%
IHEI	Room			Vol	2,400	1,200	1,200	111	80	31	147	63	84
8. Office (710)	250,000	Cars & Trucks	100%	Rate	11.01	50%	50%	1.56	88%	12%	1.49	17%	83%
	GSF			Vol	2,753	1,376	1,376	390	343	47	373	63	309
9a. Commercial (820):		Cars & Trucks	100%	Rate	42.92	50%	50%	1.03	61%	39%	3.74	48%	52%
Village Walk:200,000 sf	200,000			Vol	8,584	4,292	4,292	206	126	80	748	359	389
	GSF	Pass-By Trips	34%	Rate	14.59	50%	50%	0.35	61%	39%	1.27	48%	52%

Table 5.14-11
Trip Generation by Arrowhead Springs Development at Phase I And Full Project Build-Out

Land Use & ITE Code	Size & Unit	Traffic Composition		Rates & Vol	Average Daily Traffic Volume			AM Peak Hour Traffic Volume			PM Peak Hour Traffic Volume		
		Type	%		Total	IN	OUT	Total	IN	OUT	Total	IN	OUT
				Vol	2,919	1,459	1,459	70	43	27	254	122	132
		Net Trips			5,665	2,833	2,833	136	83	53	494	237	257
9b. Condo (230):	266	Cars & Trucks	100%	Rate	5.86	50%	50%	0.44	17%	83%	0.54	67%	33%
Village Walk	DU			Vol	1,559	779	779	117	20	97	144	96	47
9c. Apartments (220)	34	Cars & Trucks	100%	Rate	6.72	50%	50%	0.51	20%	80%	0.62	65%	35%
Village Walk	DU			Vol	228	114	114	17	3	14	21	14	7
10. Restaurant (831):	20,000	Cars & Trucks	100%	Rate	89.95	50%	50%	0.81	50%	50%	7.49	67%	33%
Windy Point	GSF			Vol	1,799	900	900	16	8	8	150	100	49
TOTAL NET TRIPS BY ALL USES IN PHASE II					16,918	8,459	8,459	977	570	407	1,560	729	830
TOTAL NET TRIPS BY ALL USES AT BUILD-OUT					**24,412**	**12,206**	**12,206**	**1,329**	**738**	**591**	**2,075**	**999**	**1,076**

Land Use Codes/notes:
820 = Shopping Center; 330 = Resort Hotel; 430 = Golf Course; 253 = Senior Housing, 831 = Quality Restaurant; 710 = Office; 220 = Apartments, 230 = Condo/Townhouse, 210 = Single Family Detached Houses; * = Existing Land Uses

Figure 5.14-2 illustrates the distribution of traffic from the project and how traffic disperses at any given intersection after the construction of Village Parkway. Appendix H of Volume III contains specific information on the number trips dispersed along these roadways.

Table 5.14-12 shows the results of roadway LOS analysis with and without Phase one development by 2007.

Table 5.14-12
2007 Average Daily Traffic (ADT) Volumes and LOS on Roadways Within the Arrowhead Springs Study Area

				2007 W/O Project Conditions			2007 With Project Conditions			
Roadways	Facility Type	No. of Lanes	Capacity, Veh/Day (C)	Volume, Veh/Day (V)	V/C Ratio	LOS	Volume, Veh/Day (V)	V/C Ratio	LOS	Diff. in V/C by Project
Highway 18 N/O Waterman Avenue	Major Arterial	4	40,000	20,730	0.518	A	27,474	0.687	B	0.169
Waterman Avenue S/O 40th Street	Major Arterial	4	40,000	18,544	0.464	A	23,789	0.595	A	0.131
Waterman Avenue N/O 30th Street	Major Arterial	4	40,000	22,918	0.573	A	28,163	0.704	B	0.131
40th Street E/O Waterman Avenue	Major Arterial	4	40,000	10,962	0.274	A	11,711	0.293	A	0.019
Harrison Street S/O 40th Street	Secondary Arterial	2	12,000	1,037	0.086	A	1,412	0.118	A	0.031
Sterling Avenue S/O Foothill Drive	Major Arterial	2	15,000	1,631	0.109	A	2,006	0.134	A	0.025
Valencia Avenue S/O 40th Street	Secondary Arterial	2	12,000	4,439	0.370	A	4,439	0.370	A	0.000
Valencia Avenue N/O 30th Street	Secondary Arterial	2	12,000	4,666	0.389	A	4,666	0.389	A	0.000

Note: A 2% per year traffic growth factor was assumed through year 2025 due to normal traffic growth in the area. The 2% yearly growth rate assumption was made per discussion with City staff. Bold typeface indicates CMP roadway.

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Arrowhead Springs Trip Distribution

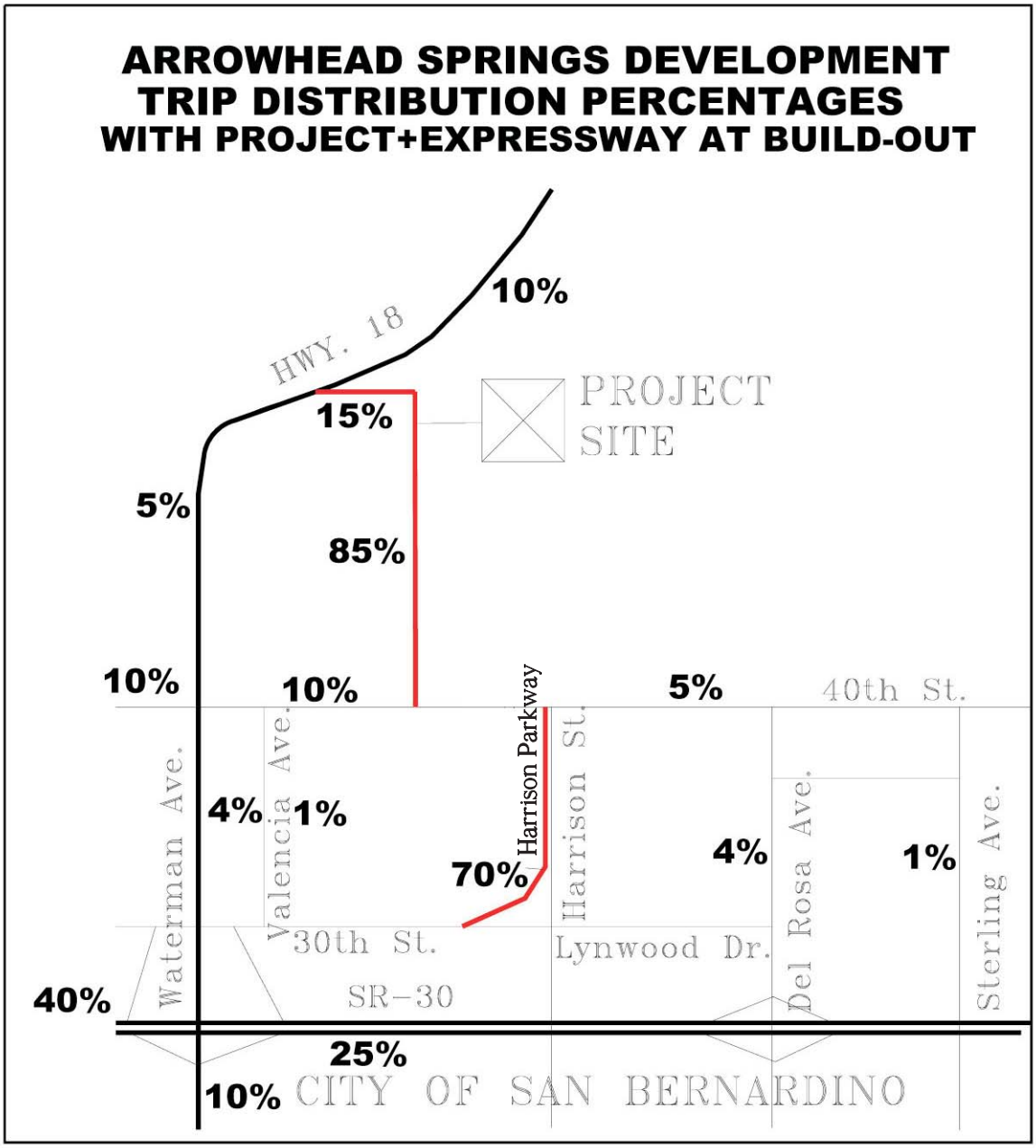

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Table 5.14-13 below shows the results of intersection LOS analysis with and without Phase one development by 2007.

Table 5.14-13
Intersection Level of Service Summary
(Future 2007 Conditions With and Without Project Phase I)

Intersection	Peak Hour	2007 Conditions Without Project			2007 Conditions With Phase I		
		LOS	Delay	V/C	LOS	Delay	V/C
Waterman Avenue at 40th Street	AM	C	26.8	0.670	C	26.5	0.677
	PM	C	25.2	0.528	C	26.0	0.599
Waterman Avenue at Parkdale Drive	AM	B	11.2	0.641	B	11.0	0.693
	PM	B	11.7	0.543	B	11.2	0.604
Waterman Avenue at 36th Street (Unsignalized)	AM	E	45.1	–	F	64.9	–
	PM	D	26.9	–	E	43.7	–
Waterman Avenue at 34th Street (Unsignalized)	AM	F	81.1	–	A	1.3	–
	PM	F	55.9	–	F	73.6	–
Waterman Avenue at Marshall Boulevard	AM	A	3.4	0.544	A	3.5	0.586
	PM	A	4.2	0.486	A	4.1	0.547
Waterman Avenue at 30th Street	AM	C	29.0	0.843	C	30.7	0.885
	PM	C	24.2	0.693	C	24.8	0.725
Valencia Avenue at 40th Street	AM	–	–	–	B	12.3	0.460
	PM	–	–	–	C	19.0	0.653
Village Parkway at 40th Street	AM	NA	–	–	C	21.5	0.335
	PM	NA	–	–	C	20.2	0.493
Harrison Street at 40th Street (Unsignalized)	AM	B	12.8	–	B	13.0	–
	PM	B	14.4	–	B	14.7	–
Del Rosa Avenue at Foothill Boulevard (Unsignalized)	AM	B	11.9	–	B	12.1	–
	PM	B	12.3	–	B	12.5	–
Sterling Avenue at Foothill Boulevard	AM	A	7.9	0.176	A	7.9	0.179
	PM	A	8.0	0.149	A	8.1	0.154
Valencia Avenue at 30th Street	AM	–	–	–	B	14.9	0.54
	PM	–	–	–	B	15.0	0.280
Del Rosa Avenue at Lynwood Drive	AM	B	15.1	0.308	B	15.1	0.310
	PM	B	14.2	0.374	B-	14.1	0.377
Sterling Avenue at Lynwood Drive	AM	B	14.1	0.509	B	14.0	0.545
	PM	B	12.6	0.437	B	14.2	0.513
30th Street at Lynwood Drive (Unsignalized)	AM	B	12.4	–	B	12.4	–
	PM	A	7.5	–	A	7.5	–

The following intersections are expected to be impacted by Phase I Project related traffic:

- Waterman Avenue and 36th Street
- Waterman Avenue and 34th Street

Table 5.14-14 shows the results of roadway LOS analysis with and without Project build-out by 2030.

Table 5.14-14
2030 Average Daily Traffic (ADT) Volumes and LOS on Roadways in the Arrowhead Springs Study Area

Roadways	Facility Type	No. of Lanes	Capacity, Veh/Day (C)	2030 W/O Project Conditions			2030 With Project Conditions			Diff. in V/C by Project
				Volume, Veh/Day (V)	V/C Ratio	LOS	Volume, Veh/Day (V)	V/C Ratio	LOS	
40th Street E/O Waterman Avenue	Major Arterial	4	40,000	17,908	0.448	A	19,129	0.478	A	0.031
Harrison Street S/O 40th Street	Secondary Arterial	2	12,000	0	0.000	A	NA	NA	NA	NA
Harrison Parkway (40th Street to 30th Street with improvements)	Major Arterial	4	40,000	NA	NA	NA	18,309	0.458	A	0.458
Highway 18 N/O Waterman Avenue	Major Arterial	4	40,000	24,062	0.602	A	25,283	0.632	B	0.031
Village Parkway	Major Arterial	4	40,000	0	0.000	A	20,750	0.519	A	0.519
Sterling Avenue S/O Foothill Drive	Major Arterial	2	15,000	2,166	0.144	A	3,387	0.226	A	0.081
Waterman Avenue N/O 30th Street	Major Arterial	4	40,000	24,062	0.602	A	24,062	0.602	A	0.000
Waterman Avenue S/O 40th Street	Major Arterial	4	40,000	24,062	0.602	A	24,062	0.602	A	0.000
Valencia Avenue N/O 30th Street	Secondary Arterial	2	12,000	5,039	0.420	A	6,259	0.522	A	0.102
Valencia Avenue S/O 40th Street	Secondary Arterial	2	12,000	4,794	0.399	A	6,015	0.501	A	0.102

Notes:
The 2030 condition assumes that Harrison Street improvements have been constructed between 30th Street with 40th Street. The new roadway is projected to attract approximately 70% of existing traffic from Highway 18, 40th Street and Waterman Avenue. CMP roadway segments are shown in bold typeface.

The project generated traffic is assumed to be distributed as follows: 15% to and from Highway 18 north of the site, 5% to and from 40th Street west of Waterman Avenue, 70% to and from SR-30 using the new roadway connecting 30th Street with 40th Street, and 10% to and from 40th Street east of the new roadway connecting the site with 40th Street. Without new roadway, project traffic will be distributed 75% to the west on 40th Street and 10% to the east on 40th Street (using Harrison Street, Del Rosa Avenue or Sterling Avenue).

Table 5.14-15 shows the results of intersection LOS analysis with and without Project build-out by 2030.

Table 5.14-15
Intersection Level of Service Summary
(Build-out 2030 Conditions With and Without Project)

Intersection	Peak Hour	2030 Base Conditions			2030 Base + Project Conditions		
		LOS	Delay	V/C	LOS	Delay	V/C
30th Street at Lynwood Drive (Unsignalized)	AM	A	9.7	–	D	25.8	–
	PM	B	11.5	–	F	185.3	–
Village Parkway at 40th Street	AM	NA	–	–	C	22.4	0.784
	PM	NA	–	–	F	143.5	1.271
Del Rosa Avenue at Foothill Boulevard(Unsignalized)	AM	B	14.8	–	C	15.7	–
	PM	C	17.5	–	C	20.2	–
Del Rosa Avenue at Lynwood Drive	AM	B	16.6	0.558	B	16.5	0.564
	PM	B	12.7	0.612	B	12.6	0.623
Harrison Street (Harrison Parkway) at 40th Street (Unsignalized)	AM	D	26.6	–	F	Overflow	–
	PM	F	Overflow	–	F	Overflow	–
Sterling Avenue at Foothill Boulevard	AM	A	8.1	0.245	A	8.2	0.253
	PM	B	10.2	0.419	B	10.4	0.436
Sterling Avenue at Lynwood Drive	AM	B	11.2	0.366	B	11.2	0.372
	PM	C	20.0	0.775	C	20.5	0.781
Waterman Avenue at 30th Street	AM	F	138.9	1.215	F	115.6	1.222
	PM	F	96.5	1.180	F	88.8	1.200
Waterman Avenue at 34th Street (Unsignalized)	AM	D	26.7	–	D	27.5	–
	PM	F	110.6	–	F	125.2	–
Waterman Avenue at 36th Street (Unsignalized)	AM	F	54.8	–	F	58.4	–
	PM	F	87.5	–	F	99.1	–
Waterman Avenue at 40th Street	AM	C	28.5	0.820	C	30.8	0.856
	PM	D	42.9	0.982	D	51.5	1.033
Waterman Avenue at Marshall Boulevard	AM	A	4.6	0.626	A	4.6	0.633
	PM	A	5.0	0.633	A	5.0	0.644
Waterman Avenue at Parkdale Drive	AM	A	3.7	0.553	A	3.7	0.559
	PM	A	5.3	0.651	A	5.3	0.662
Valencia Avenue at 40th Street	AM	C	15.0	0.667	C	17.3	0.731
	PM	F	72.4	1.129	F	107.1	1.260
Valencia Avenue at 30th Street	AM	A	1.0	0.137	A	1.4	0.251
	PM	B	12.7	0.304	A	8.5	0.496

The following intersections are expected to be impacted by the Project related traffic at build-out:

- Waterman Avenue and 40th Street
- Waterman Avenue and 36th Street
- Waterman Avenue and 34th Street
- Waterman Avenue and 30th Street
- Harrison Parkway and 40th Street
- 30th Street and Lynwood Drive
- Village Parkway and 40th Street
- Valencia Avenue and 40th Street

AHS IMPACT 5.14-2: ***ARROWHEAD SPRINGS RELATED TRIP GENERATION IN COMBINATION WITH EXISTING AND PROPOSEDCUMULATIVE DEVELOPMENT WOULD NOT RESULT IN DESIGNATED ROAD AND/OR HIGHWAYS EXCEEDING COUNTY CONGESTION MANAGEMENT AGENCY SERVICE STANDARDS. [THRESHOLD T-2]***

Impact Analysis: As discussed in impact analysis 5.15-1 above, the CMP roadway segments would meet both the City and County CMP standards for Intersection Level of Service. There are no designated CMP intersections in the Arrowhead Springs Specific Plan study area.

AHS IMPACT 5.14-3: ***THE PROPOSED PROJECT WOULD NOT CHANGE AIR TRAFFIC PATTERNS THAT WOULD RESULT IN SUBSTANTIAL SAFETY RISKS. [THRESHOLD T-3]***

Impact Analysis: The proposed Arrowhead Springs development does not include structures/features that would impact traffic patterns; and is not located within airport noise or safety zones, nor does it include airports or heliports. The project would not impact or be impacted by air traffic patterns.

AHS IMPACT 5.14-4: ***PROJECT CIRCULATION IMPROVEMENTS HAVE BEEN DESIGNED TO ADEQUATELY ADDRESS POTENTIALLY HAZARDOUS CONDITIONS (SHARP CURVES, ETC), POTENTIAL CONFLICTING USES, AND EMERGENCY ACCESS. [THRESHOLD T-4, T-5]***

Impact Analysis: The circulation plan for the Arrowhead Springs project would be required to meet the roadway design standards of the City of San Bernardino which would address any potential hazardous conditions. Preliminary consultations with the City regarding the circulation plan and a subsequent alignment study established the need for a secondary emergency access, which became part of the project design (Village Parkway) reducing the potential for hazardous conditions.

AHS IMPACT 5.14-5: ***ADEQUATE PARKING WOULD BE PROVIDED BY THE PROPOSED PROJECT. [THRESHOLD T-6]***

Impact Analysis: All new development planned for the Arrowhead Springs Specific Plan would be required to meet the parking standards contained in the Municipal Code (Chapter 19.24). These parking standards are reflected in the Development Standards of the specific plan, which will be adopted by ordinance ensuring that adequate parking would be provided for the development.

5.14.4 Existing Regulations and Standard Conditions

Portions of Title 12, *Streets, Sidewalks and Public Places,* and Title 19, *Land Use and Subdivision Regulations,* Chapter 19.24, *Off-Street Parking Standards,* would apply to both the General Plan update and the Arrowhead Springs specific Plan.

5.14.5 Level of Significance before Mitigation

5.14.5.1 San Bernardino General Plan

Upon implementation of General Plan policies, regulatory requirements, and standard conditions of approval, the following impacts would be less than significant:

GP Impact 5.14-3

GP Impact 5.14-4

GP Impact 5.14-5

Without mitigation, the following impacts would be **significant**:

GP Impact 5.14-1 Twelve intersections were determined to function at an unacceptable LOS of E or worse and 4 roadway segments were determined to function at an unacceptable LOS of D or worse at build-out of the General Plan. Numerous freeway segments would also function at and unacceptable LOS F.

GP Impact 5.14-2 One CMP intersection and one CMP roadway segment were determined to function at an unacceptable LOS of F as well as numerous freeway segments.

5.14.5.2 Arrowhead Springs Specific Plan

Upon implementation of regulatory requirements, and standard conditions of approval, the following impacts would be less than significant:

AHS Impact 5.14.2

AHS Impact 5.14.3

AHS Impact 5.14.4

AHS Impact 5.14.5

Without mitigation, the following impacts would be **significant**:

AHS Impact 5.14.1 Two intersections were determined to be impacted by Phase I traffic and 7 intersections would be impacted by full build-out of the project or by the year 2030. No roadway segments would be impacted after Phase I or full build-out of the project.

5.14.6 Mitigation Measures

5.14.6.1 San Bernardino General Plan

GP 5.14-1 Prior to adoption of the General Plan Update the City of San Bernardino shall add the following recommendations to the Circulation Element of the General Plan update:

- **Signalize the intersection of Meridian Avenue @ Rialto Avenue**. With signalization and permitted phasing the intersection will operate at LOS A during both peak hours.
- **Signalize the intersection of Hunts Lane @ E Street.** With signalization and protected phasing, and the addition of one NB left-turn lane the intersection will operate at LOS B and C during the AM and PM peak hours, respectively.
- **Add an additional westbound right-turn lane at the intersection of Waterman Avenue @ 30th Street.** With one additional WB right-turn lane the intersection will operate at LOS D and C during the AM and PM peak hours, respectively.

- **Add an additional northbound right-turn lane at the intersection of Waterman Avenue @ SR-30 EB Ramps.** With one additional NB right-turn lane and one additional EB left-turn lane the intersection will operate at LOS D during both peak hours.

- **Signalize the intersection of SR-30 WB Off-ramp @ 30th Street.** With signalization and protected phasing, the intersection will operate at LOS C during both peak hours.

- **Signalize the intersection of Harrison Street @ 40th Street.** With signalization and permitted phasing the intersection will operate at LOS A and C during the AM and PM peak hours, respectively.

- **Signalize the intersection of Waterman Avenue @ 36th Street.** With signalization and permitted phasing the intersection will operate at LOS A and B during the AM and PM peak hours, respectively.

- **Signalize the intersection of Waterman Avenue @ 34th Street.** With signalization and permitted phasing the intersection will operate at LOS A during both peak hours.

- **Signalize the intersection of Valencia Avenue @ 40th Street.** With signalization and permitted phasing the intersection will operate at LOS A during both peak periods.

- **Add an additional westbound right-turn lane at the intersection of Del Rosa Avenue @ SR-30 WB Ramps.** With one additional WB right-turn lane the intersection will operate at LOS B and C during AM and PM peak hours, respectively.

- **Signalize the intersection of Tippecanoe Avenue @ Rialto Avenue.** With signalization and permitted phasing the intersection will operate at LOS A and B during AM and PM peak hours, respectively.

- **Signalize and add one northbound exclusive left-turn lane and one exclusive northbound right-turn lane at the intersection of Rancho Avenue @ 5th Street/Foothill Road.** With signalization and E/W protective phasing, N/S split phasing, one NB exclusive left-turn lane and one NB exclusive right-turn lane the intersection will operate at C and D during AM and PM peak hours, respectively.

- **Signalize and add one additional through lane in each direction at the intersection of Mount View Avenue @ San Bernardino Road.** With signalization, protective phasing and one exclusive left, thru and right-turn lane in each direction, and EB right turn overlap phasing the intersection will operate at LOS C and D during AM and PM peak hours, respectively.

GP 5.14-2 The City of San Bernardino shall cooperate with regional transportation agencies toward mitigating impacts to regional transportation facilities by measures such as securing fair share contributions from future projects impacting mainline freeway

segments. Mitigation of impacts to regional transportation facilities would require the following freeway improvements:

- I-10 EB from Jct. I-21 to Waterman Avenue, add two lanes.
- I-10 WB from Jct. I-21 to Waterman Avenue, add one lane.
- I-10 EB and WB from Waterman Avenue to Tippecanoe Avenue, add two lanes each direction.
- I-10 EB and WB from Tippecanoe to Mountain View, add two lanes each direction.
- SR-30 EB from Highland Avenue to Jct. I-215, add two lanes.
- SR-30 WB from Highland Avenue to Jct. I-215, add one lane.
- SR-30 EB and WB from Jct. I-215 to H Street, add one lane each direction.
- SR-30 EB and WB from H Street to SR-259 add one lane each direction.
- SR-30 EB from SR-259 to Waterman Avenue, add one lane.
- I-215 NB and SB from Jct. 1-10 to Orange Show Road, add one lane.
- I-215 NB from Jct. SR 66 to Baseline Street, add three lanes.
- I-215 SB from Jct. SR 66 to Baseline Street, add two lanes.
- I-215 NB and SB from Jct. SR 66 to University Parkway, add one lane.

5.14.6.2 Arrowhead Springs Specific Plan

AHS 5.14-1A Prior to issuance of occupancy permits the project applicant shall be required to complete or bond for the costs of engineering and construction of the following project related traffic improvements or equivalent for Phase I (as detailed in the traffic study) impacts of 2007:

- Waterman Avenue @ 36th Street. Install signalization with permitted phasing.
- Waterman Avenue @ 34th Street. Install signalization with permitted phasing.

AHS 5.14-1B Prior to issuance of occupancy permits for Phase II (as detailed in the traffic study) and all phases thereafter the project applicant shall be required to complete or bond for the costs of engineering and construction of the following project related traffic improvements or equivalent for impacts due to full build-out of the project:

- Waterman Avenue @ 30th Street. Install protected phasing and one additional WB right-turn lane, and one additional SB right-turn lane, both with overlap right-turn phasing.
- Harrison Parkway (new) @ 40th Street. Install signalization, permitted phasing and two NB left-turn lanes, one NB right-turn lane, an exclusive EB right-turn lane and an exclusive WB left-turn lane
- Waterman Avenue @ 36th Street. Install signalization and permitted phasing.
- 30th Street @ Lynwood Drive. Reconfigure intersection to align with new Harrison Parkway and install signal.
- Waterman Avenue @ 40th Street. Add an exclusive right-turn lane in each direction and westbound right-turn overlap phasing.
- Waterman Avenue @ 34th Street. Install signal and permitted phasing.
- Village Parkway @ 40th Street. Install signal with protected EW phasing and the intersection configuration of; two SB left-turn lanes, one SB right-turn lane, two EB thru-lanes, one EB left-turn lane, two WB thru-lanes and one WB right-turn lane.

5.14.7 Level of Significance After Mitigation

5.14.7.1 San Bernardino General Plan

Although the mitigation measures listed above would mitigate GP Impact 5.14-1, the following impact would remain significant:

- GP Impact 5.14-2

While potential impacts to the freeway mainline segments and ramps have been evaluated and mitigation measures suggested to reduce impacts, improvements to the freeway system are the responsibility of the existing regional transportation agencies and not the City of San Bernardino. Without the authority to implement the mitigation measures, the impact to freeway segments would remain significant and unavoidable requiring a statement of overriding considerations.

5.14.7.2 Arrowhead Springs Specific Plan

The mitigation measures identified above would reduce potential impacts associated with transportation and traffic to a level that is less than significant. Therefore, no significant unavoidable adverse impacts relating to transportation and traffic have been identified. Table 5.14-16 shows the results of intersection LOS analysis before and after mitigation measures for the year 2007.

Table 5.14-16
Before and After Mitigation Level of Service Summary
2007 Conditions

Intersection	Peak Hour	Conditions Before Mitigation			Conditions After Mitigation		
		LOS	Delay	V/C	LOS	Delay	V/C
Waterman Avenue at 36th Street	AM	F	64.9	–	A	3.8	0.572
	PM	E	43.7	–	B	3.4	0.501
Waterman Avenue at 34th Street	AM	A	1.3	–	A	3.3	0.569
	PM	F	73.6	–	A	3.3	0.517

Note: Only those intersections operating at unacceptable LOS D, E or F were Mitigated per CMP guidelines.

Table 5.14-17 shows the results of intersection LOS analysis before and after above mitigation measures.

Table 5.14-17
Before and After Mitigation Level of Service Summary
2030 Conditions

Intersection	Peak Hour	Conditions Before Mitigation			Conditions After Mitigation		
		LOS	Delay	V/C	LOS	Delay	V/C
Waterman Avenue at 40th Street	AM	C	30.8	0.856	C	27.1	0.764
	PM	D	51.5	1.033	C	32.1	0.881
Waterman Avenue at 36th Street	AM	F	58.4	–	A	3.4	0.537
	PM	F	99.1	–	B	11.4	0.782
Waterman Avenue at 34th Street	AM	D	27.5	–	A	2.8	0.544
	PM	F	125.2	–	A	3.5	0.610
Waterman Avenue at 30th Street	AM	F	115.6	1.222	D	51.7	0.928
	PM	F	88.8	1.200	D	38.9	0.912
Village Parkway at 40th Street	AM	C	22.4	0.784	B	15.5	0.503
	PM	F	143.5	1.271	C	21.7	0.747
Harrison Parkway at 40th Street	AM	F	Overflow	–	B	14.8	0.607
	PM	F	Overflow	–	C	28.7	0.907
30th Street at Lynwood Drive (Unsignalized)	AM	D	25.8	–	A	8.9	–
	PM	F	185.3	–	C	19.0	–

Note: Only those intersections operating at unacceptable LOS D, E or F were Mitigated per CMP guidelines.

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5.15 UTILITIES AND SERVICE SYSTEMS

This section addresses utilities and service systems including: Water Supply and Distribution Systems, Wastewater Treatment and Collection, Storm Drain Systems, and Solid Waste. The analysis in the section is based in part on service questionnaires (see appendix E, Volume I) and the following technical reports:

- *Del Rosa Mutual Water Company Water Supply Assessment for Arrowhead Springs Development,* Del Rosa Mutual Water Company, May 2005 (Revised).
- *Domestic Water, Irrigation Water, Wastewater and Recycled Water Facility Plan for Arrowhead Springs Property,* American Development group, May 2005 (Revised).
- *Arrowhead Springs Annexation Study: Plan for Service, City of San Bernardino,* Development Services Department, City of San Bernardino, prepared by Stanley R. Hoffman Associates, May 2 2005.

5.15.1 Water Supply and Distribution Systems

5.15.1.1 Environmental Setting

San Bernardino General Plan

Water Supply

Domestic water service to the City of San Bernardino and Sphere of Influence (SOI) is provided by the San Bernardino Municipal Water Department (SBMWD) and the East Valley Water District (EVWD). Water service is provided for single-family, multiple-family, commercial, light industrial, governmental, and landscaping purposes. The SBMWD serves an area of approximately 43 square miles with 35,246 service connections. The Department produces over 497 gallons per capita per day, with the average consumption use reaching 330 gallons per capita per day. Currently, the SBMWD available groundwater supply is approximately 49,460 acre-feet per year or 16.1 billion gallons per year. The EVWD serves the eastern portion of San Bernardino planning area, serving approximately 28.5 square miles. In 2004, the District produced approximately 24,276 acre-feet of water per year. Together, the SBMWD and EVWD produce approximately 73,736 acre-feet per year.

The primary source of water for SBMWD and the EVWD is groundwater from the Bunker Hill Sub-Basin. The basin is replenished naturally by local precipitation and by stream flow from rain and snowmelt from the San Gabriel and San Bernardino Mountains.[1] The Santa Ana River, Mill Creek, and Lytle Creek contribute more than 60 percent of the total recharge to the ground water system (see Section 5.7, *Hydrology)*. The sub-basin is also replenished by percolation of water diverted to spreading grounds (percolation basins), such as those that flank the northern boundary of the City at the base of the San Bernardino Mountains. While groundwater is the principal source of supply in the planning area, other sources of water supply include the State Water Project (SWP). The Bunker Hill Sub-basin has a total capacity of 5,976,000 acre-feet, and total storage of 5,890,300 acre-feet (1.9 billion gallons) (1998) of water per year. Distribution of the groundwater water to more than 20 local public and private water suppliers within the San Bernardino Basin is managed through the San Bernardino Valley Municipal Water District (SBVMWD).

San Bernardino Valley Municipal Water District (SBVMWD) was formed in 1954 to plan long-range water supply for the San Bernardino Valley. It imports water into its service area through participation in the California State Water Project and manages groundwater storage within its boundaries. SBVMWD covers

[1] City of San Bernardino Municipal Water Department, *Urban Water Management Plan Update for the Planning Period 2000-2020*, January 2002.

about 325 square miles and includes the cities and communities of San Bernardino, and other cities within the region. The District's responsibility for long-range water supply planning includes importing supplemental water and management of the groundwater basins within its boundaries. The District maintains groundwater supplies in three groundwater basins: Bunker Hill, Yucaipa, and San Timoteo. The District is legally responsible to maintain the groundwater level in the Bunker Hill Aquifer at the designated "safe yield", currently 167,000 acre-feet year (54.4 billion gallons). The safe yield is the annual amount of water that can be taken from a source of supply over a period of years without depleting that source beyond its ability to be replenished naturally in "wet years." Currently extraction from the basin does not exceed natural or artificial recharge. In addition to safe yield supplies, the Bunker Hill Basin has over 250,000 acre-feet of contaminated water; sources of contamination include the Norton Air Force Base and Leaking Undergound Storage Tanks which are discussed in Section 5.6, *Hazards and Hazardous Materials.*[2]

Water Distribution

The SBMWD distributes to over 151,000 residents in the City. SBMWD facilities include 60 active wells, four treatment plants with capacity of 50 million gallons per day, 32 reservoirs with a total capacity of more than 100 million gallons (MG) of domestic storage water capacity, 27 chlorination facilities, and 66 booster pump stations. The distribution system includes approximately 551 miles of water mains, 41,317 active water meters and over 4,000 fire hydrants.

The EVWD system facilities consist of approximately 150 miles of pipeline, 13 wells, 14.2 MG of storage facilities, and 41 booster stations.

Arrowhead Springs Specific Plan

Water Supply

The Del Rosa Mutual Water Company (DRMWC) and the West Twin Creek Water Company currently provide water for the existing facilities on the Arrowhead Springs property. The DRMWC owns the rights to water from the East Twin Creek watershed through a pre-1914 right and by virtue of Judgment 31798, October 19, 1931. West Twin Water Company was awarded rights in West Twin Creek in Case No. 4733 dated June 14, 1894.

Current domestic water supply is obtained under permit from the County of San Bernardino, Department of Environmental Health from four relatively shallow wells constructed within the project area: Rods Well, Football Field, Rowan Well, and Strawberry Creek Well. Irrigation water is obtained from surface water diversions on East Twin Creek in Coldwater Canyon and West Twin Creek. Domestic and irrigation water use is approximately 81.21 acre-feet and 1,768.33 acre-feet, respectively.

Additional supply of imported water can be obtained from the State Project Water (SPW) through the San Bernardino Valley Municipal Water District which contracts for 102,600 acre-feet of water annually. In case of water shortage, the DRMWC maintains a Water Shortage Contingency Plan that contains an Emergency Fund and a Contamination Fund.

Water Distribution

Currently, there are two separate water systems (domestic and irrigation water) that serve the existing development area of approximately 200 acres. Each system has its own reservoir and distribution pipelines. The domestic system reservoir holds approximately 396,000 gallons and is used exclusively for drinking water, which is chlorinated at all times. The irrigation system reservoir holds 325,000 gallons including 125,000 gallons in reserve for fire fighting. Fire hydrants are connected to the irrigation system.

[2] California's Groundwater Bulletin 118, Hydrologic Region South Coast Upper Santa Ana Valley Groundwater Basin, Bunker Hill Subbasin.

5.15.1.2 Thresholds of Significance

According to Appendix G of the CEQA Guidelines, a project would normally have a significant effect on the environment if the project:

WS-1 Would require or result in the construction of new water treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.

WS-2 Would not have sufficient water supplies available to serve the project from existing entitlements and resources, and new and/or expanded entitlements would be needed.

5.15.1.3 Environmental Impacts

The following impact analysis addresses thresholds of significance for which the Initial Study disclosed potentially significant impacts. The applicable thresholds are identified in parentheses after the impact statement.

San Bernardino General Plan

GP IMPACT 5.15-1: UPGRADES TO THE EXISITING WATER SUPPLY AND DELIVERY SYSTEMS WOULD BE REQUIRED TO ADEQUATELY SERVE FUTURE GROWTH IN ACCORDANCE WITH THE PROPOSED GENERAL PLAN BUILD-OUT. [THRESHOLD WS-1 AND WS-2]

Impact Analysis: The City of San Bernardino is home to approximately 185,401 people. Upon build-out of the San Bernardino General Plan, the maximum population of the planning area could reach 316,241people. This population growth would result in increased withdrawals of groundwater within the Bunker Hill Groundwater Basin.

Currently the annual water demand is approximately 330 gallons of water per person per day or 120,450 gallons per person per year. The total demand is approximately 61,182,330 gallons per person per day or 22,331,550,450 gallons per year (68,533 acre-feet per year).

The continued development of the City would increase citywide total domestic water demand to approximately 105,349,530 gallons per day or 38,452,578,000 gallons per year (118,007 acre-feet) upon General Plan build-out. Build-out of the general plan will increase water use by 50,647,377 gallons per day or 16,121,028,000 gallons per year (49,474 acre-feet), increasing approximately 72 percent. Currently, the EVWD and SBMWD produce a combined total of approximately 73,736 acre-feet per year, 44,271 acre-feet per year less than the future demand. Water treatment plants would require expansion to meet the increased demand.

Furthermore, although Bunker Hill has a safe yield of 167,000 acre-feet (54.4 billion gallons) per year and excess of approximately 50,000 acre-feet, the City of San Bernardino's total future demand represents approximately 71 percent of the total available supply in Bunker Hill, increasing 30 percent from 41 percent. As discussed above, Bunker Hill Sub-Basin provides water to over 20 local and private water suppliers, serving approximately 500,000 people.[3] Assuming similar trends, other areas within the San Bernardino Valley will increase future demands as a result of population growth therefore creating more demand on the Bunker Hill Basin. Project-specific impacts are more or less on a per meter basis, depending on a variety of factors such as the type of development, the density of residential developments, and the level and type of landscaping and water-dependent amenities within each project. According to the City of San Bernardino

[3] 2000 Drinking Water Consumer Confidence Report, City of San Bernardino Municipal Water District. http://www.ci.san-bernardino.ca.us/pdf/Water/

Municipal Water Department (SBMWD), water shortages have not been experienced by the department nor are they anticipated within this planning period based on current growth projections, hydrologic conditions, and the amount of groundwater in storage at the Bunker Hill Groundwater Basin.

The SBVMWD is legally responsible to maintain the groundwater level in the Bunker Hill Aquifer at the designated safe yield, and is responsible to obtain water through other means, including SWP and local runoff, to support the population within San Bernardino Valley Basin. The SBVMWD has secured a contract for 102,600 acre-feet per year of water from the SWP alone. The SBVMWD[4] recognizes that future demands for water will increase and be significantly greater than the combined yield of local ground water and surface water supplies under existing conditions. The focus of The Regional Water Facilities Master Plan is to give highest priority for further development of local supplies, with imported water being used to meet the remaining needs. Included in the Master Plan are a number of proposed water resource management strategies in order to increase production within its jurisdiction.

Furthermore, the SBMWD has established guidelines for water conservation and an enforcement plan as a part of its resolution adopting the 2000 Urban Water Management Plan Update (UWMPU) for the planning period 2000-2020. The UWMPU is in conjunction with the Drought Contingency Plan, Emergency Water Shortage Plan, State Water Project, and various water conservation programs.

Future infrastructure development such as treatment plants would be subject to CEQA review and subsequent mitigation for potential adverse impacts on the environment.

Relevant General Plan Policies and Programs

Utilities Element

Policy 9.3.1: Provide for the construction of upgraded and expanded water supply, transmission, distribution, storage, and treatment facilities to support existing and new development.

Policy 9.3.2: Maintain and replace existing water supply, transmission, distribution, storage systems, and treatment facilities as necessary.

Policy 9.3.4: Require adequate water supply, transmission, distribution, storage, and treatment facilities to be operational prior to the issuance of certificates of occupancy.

Policy 9.3.5: Monitor the demands on the water system and, as necessary, manage development to mitigate impacts and/or facilitate improvements.

Policy 9.3.6: Impose limits on new water hook-ups, if necessary, to comply with available domestic water supply.

Policy 9.3.7: Request the Board of Water Commissioners to evaluate the Water System Master Plan, as necessary, to accurately determine which water facilities will be needed to serve present and future growth in the City.

Policy 9.10.1: Require that new development proposals bear the cost to improve wastewater collection and treatment facilities, water supply transmission, distribution, storage, and treatment facilities, and storm drain and flood control facilities as necessitated by the proposed project. This shall be accomplished either through the payment of fees, or by the actual construction of the improvements.

[4] The Regional Water Facilities Master Plan. SBVMWD, 1995.

Policy 9.10.2: Collect adequate amounts of fees and charges to fund the operation/maintenance of existing facilities and to construct new facilities.

Policy 9.10.3: Review utility, capacity, and infrastructure fees, as well as development, acquisition of service, and monthly service charges on an annual basis to ensure that adequate amounts of fees and charges are collected to fund the operation/maintenance of existing facilities and to construct new facilities.

Policy 9.10.4: Provide public funding support for expansion and upgrading of public utilities and infrastructure when improvements will provide substantial public benefit to the City.

Policy 9.10.5: Allow the formation of benefit assessment districts and community facilities districts, where appropriate, in which those who benefit from specific improvements pay a pro rata share of the costs.

Safety Element

Policy 10.4.1: Promote integrated inter-agency review and participation in water resource evaluation and mitigation programs.

Policy 10.4.2: Protect surface water and groundwater from contamination.

Policy 10.4.3: Eliminate or remediate old sources of water contamination generated by hazardous materials and uses.

Energy and Water Element

Policy 13.2.1: Coordinate and monitor the City's water conservation efforts on an annual basis and modify or expand them as necessary to ensure their effectiveness.

Policy 13.2.2: Require that development not degrade surface or groundwater, especially in watersheds, or areas with high groundwater tables or highly permeable soils.

Policy 13.2.3: Consider the establishment of incentives, funding programs, or a rebate program for projects that implement water conservation measures, such as replacing aging, leaking, and/or inefficient plumbing with more efficient, water-saving plumbing.

Policy 13.2.4: Require the use of reclaimed water for landscape irrigation and other non-contact uses for industrial projects, golf courses, and freeways.

Policy 13.2.5: Mitigate degradation of the groundwater basins that may have already occurred by existing commercial, industrial, and other uses.

Policy 13.2.6: Require the replacement of existing septic systems with connections to a sanitation collection and treatment system as a condition of reconstruction or reuse.

Policy 13.2.7: Require that new development incorporate improvements to channel storm runoff to public storm drainage systems and prevent discharge of pollutants into the groundwater basins and waterways.

Policy 13.2.8: Require that development in the City's watersheds incorporate adequate landscape and groundcover to prevent slope erosion and significant sedimentation of canyon drainages.

Policy 13.2.9: Continue to inform the public about water conservation, techniques and available water conservation programs they can utilize.

Arrowhead Springs Specific Plan

AHS IMPACT 5.15-1: IMPLEMENTATION OF THE ARROWHEAD SPRINGS SPECIFIC PLAN WOULD REQUIRE CONSTRUCTION OF A NEW WATER SYSTEM AND INCREASE ON-SITE WATER DEMAND BY APPROXIMATELY 4,035 ACRE-FEET AT BUILD-OUT. [THRESHOLD WS-1 AND WS-2]

Impact Analysis: Arrowhead Springs Water & Power (AWP) would be responsible for the design, construction, and operation of any and all water distribution systems within the project, with water supplied through either West Twin Creek Water Company or the Del Rosa Mutual Water Company. AWP would manage the water resources at Arrowhead Springs through sale of both domestic and irrigation water. The existing domestic and irrigation water distribution systems would be completely replaced with new expanded storage, treatment and distribution systems as described in Chapter 3.0, illustrated in Figure 3.3-7 and Figure 3.3-8 and detailed in Appendix J. The domestic and irrigation water distribution systems would be located separately but within the same rights-of-way in existing or proposed roadways in most areas. However, some reservoirs and pipelines would need to be located outside of the grading footprint shown on Figure 3.3-6 to achieve the appropriate elevation to pressurize the system. Locating these reservoirs outside the grading footprint would cause additional removal of vegetation and grading to establish the pad site and an access road. Some reservoirs may be visible to travelers on SR-18, new residents within the development and residential communities to the southeast and southwest of the property boundary. Impacts on the environment from development of the domestic and irrigation water systems have been documented in Section 5.1, *Aesthetics;* Section 5.3 *Biological Resources;* and Section 5.7, *Hydrology and Water Quality.*

Water Demand

The domestic water requirements for Arrowhead Springs are based upon the criteria established in the facilities plan for the development (described in Section 3.02 of Appendix J, Volume III). These requirements are summarized in Table 5.15-1 on the following page. The domestic water requirement would include drinking water for the commercial, office and residential areas including irrigation of residential landscaping and fire flow.

Table 5.15-1
Facility Description, EDU's, and Average Annual Domestic Water Requirement

Facility Description	Equivalent Dwelling Units (EDU)[1]	Water Required (Gallons per Day)
Residential		
RL – North	24	15,360
RL – South	12	7,680
RM – Residential	980	627,200
RM – Senior 1	188	120,320
CR-2 – Residential	34	21,760
Totals	*1,238*	*792,320*
Commercial and Office		
CG-1	7	4,480
CR-2 – Commercial	125	80,000
CG-1 – WP	13	8,320
CR-2 – Corp. Office	195	124,800
PCR	14	8,960

Table 5.15-1
Facility Description, EDU's, and Average Annual Domestic Water Requirement

Facility Description	Equivalent Dwelling Units (EDU)[1]	Water Required (Gallons per Day)
Totals	*354*	*226,560*
Hotel/Conference Center		
CG-1-H/S (250 rooms + 8 units)	422	265,600
CG-1-H/S (50 rooms)	110	74,880
CG-1-H/S (300 rooms)	313	200,320
Totals	*845*	*540,800*
Grand Total	***2,437***	***1,559,680***

[1]Domestic water requirements for all land uses (commercial, office and residential) have been converted to "Equivalent Dwelling Units" so a common factor is created for all water use facilities. An Equivalent Dwelling Unit is equal to the projected water use of a single-family home. In this respect, the Equivalent Dwelling Unit is calculated to be 200 gallons per day per person multiplied by an occupancy of 3.2 people per household, which equates to an annual average water use of 640 gallons per day

The average daily domestic water requirement at full build-out would be 1,559,680 gallons per day. This amount equals an annual water requirement of approximately 1,993 acre-feet of water per year. Drought years may cause the demand for water to increase to approximately 2,154 acre-feet per year.

Irrigation system would supply water for irrigation of the 199 acre golf course, parks, fuel modification zone, and other landscaped common areas. The average annual demand for irrigation water has been estimated to be 2,042 acre-feet.

Water Supply Analysis

An adequate supply of domestic and irrigation water for development of the Arrowhead Springs Specific Plan is dependant on stream flows in the East Twin Creek and West Twin Creek watersheds, on-site wells and recycled wastewater. The East Twin Creek watershed has averaged 4,262 acre-feet per year during the period from 1921 through 1998 but the flow has varied from a high of 16,750 acre-feet per year to a low of 612 acre-feet per year during this same time period. With an average annual domestic water requirement of 1,993 acre-feet, the project could obtain all of its domestic water from the East Twin Creek watershed in an average year. However in a low flow year, an additional 1,381 acre-feet of water would need to be obtained from the Bunker Hill Sub-basin and if the water flow is as low as 612 acre-feet the area is most likely in a drought condition which would increase demand to 2,154 acre-feet per year. In a worst case situation such as this, 1,542 acre-feet per year or more may be needed from the wells in the Bunker Hill Sub-basin for domestic water. The East Twin Creek Watershed may also present a difficulty when treating water as a result of wildfires and/or turbidity necessitating an increase on reliance of well water in the basin. In the event of multiple dry years when little if any water has flowed into the basin and there is not an adequate balance (from previous years) for withdrawal by wells, the DRMWC would be allowed to contract for additional water in the basin due to an overlapping service boundary. The Bunker Hill Sub-basin would have adequate supplies to meet this demand if needed (see discussion under San Bernardino General Plan Update). Prior to final determination of treatment and disinfectant for use as drinking water and in accordance with regulations of the Safe Drinking Water Act found in California Health and Safety Code, Title 22, a Watershed Sanitary Survey would need to be completed and approved along with numerous other permit requirements before operation of the system can begin.

Water for irrigation would be supplied by the West Twin Creek Water Company through a diversion on West Twin Creek, recycled wastewater generated on the project site or wells in the Bunker Hill Sub-basin. The flow in West Twin Creek has been as low as 192 acre-feet a year and as high as 10,700 acre-feet a year with an average of 2,491 acre-feet per year calculated over the years between 1921 and 1998. It is estimated that 977 acre-feet of recycled wastewater would be available at full build-out for use as irrigation water (see Section 5.15.2) and 13 acre-feet would be available from the Steam Cave Well. Therefore, approximately 1,952 acre-feet of an estimated irrigation demand of 2,042 acre-feet would need to be obtained from either West Twin Creek or wells in the basin. As with the water from East Twin Creek in years of high flow water would be allowed to flow into the spreading basins for extraction by wells in years of low water flow. Biological resource constraints may prevent extraction of all water in low water years which would create a shortfall of more than 1,700 acre-feet that would need to be obtained from wells in the basin (if the historic low was allowed to flow unimpeded). In an average year West Twin Creek would be able to supply approximately 600 acre-feet, requiring 650 acre-feet to be obtained from wells in the Bunker Hill Basin.

The combined domestic and irrigation water average annual demand for the Arrowhead Springs Specific Plan development would be 4,035 acre-feet. In an average year there would be enough water flow in both watersheds to supply all but 650 ace-feet of water which would be obtained from the wells in the basin. On average the excess water flow into the basin would balance the amount to be extracted by wells as supplement for low flow years. Only in extreme periods drought would amounts up to 3,494 acre-feet (combined) need to be withdrawn from wells in the basin as a worst case scenario. In the event of a sustained drought over a number of years, the Bunker Hill sub-basin would have adequate supplies to meet this demand.

The development of the expanded water supply and distribution system requires permitting through the State Department of Heath Services and reassertion of water rights with the State to extract a far greater amount of water than has previously been utilized. Although the analysis indicates that by using flow “averages” there would appear to be adequate water for the new system, the practice of “balancing” low flow years with water from the Bunker Hill sub-basin has not been proven or approved nor is there certainty regarding quantities of water granted through the exercise of water rights.

5.15.1.4 Existing Regulations and Standard Conditions

San Bernardino

- Senate Bill 610 (Chapter 643, Statutes of 2001) and Senate Bill 221 (Chapter 642, Statutes of 2001) amended State law, effective January 1, 2002, to improve the link between information of water supply availability and certain land use decisions made by cities and counties. SB 610 and SB 221 are companion measures which seek to promote more collaborative planning between local water suppliers and cities and counties. Both statutes require detailed information regarding water availability to be provided to the city and county decision-makers prior to approval of specified large development projects. Both statutes also require this detailed information be included in the administrative record that serves as the evidentiary basis for an approval action by the city or county on such projects. Both measures recognize local control and decision making regarding the availability of water for projects and the approval of projects.

- Under SB 610, water assessments must be furnished to local governments for inclusion in any environmental documentation for certain projects (as defined in Water Code Section 10912[a]) subject to the CEQA. Under SB 221, approval by a city or county of certain residential subdivisions requires an affirmative verification of sufficient water supply. SB 221 is intended as a ‘fail safe’ mechanism to ensure that collaboration on finding the needed water supplies to serve a new large subdivision occurs before construction begins.

- All projects must comply with Section 405 of the Clean Water Act, the Solid Waste Disposal Act (SWDA) and State regulations contained in any applicable State sludge management plan prepared pursuant to Subtitle D of the SWDA, the Clean Air Act, the Toxic Substances Control Act, and the Marine Protection, Research and Sanctuaries Act.

Arrowhead Springs

The California State Department of Health Services, Division of Drinking Water and Environmental Management, administers the following codes and regulations relating to water supply and delivery systems:

- California Health & Safety Code, Division 104, Environmental Health, Part 12, Drinking Water, Chapter 4 – Safe Drinking Water Act, Chapter 5 – Water Equipment, and Chapter 7 – Water Supply contain the statues governing the water quality, development of infrastructure and water supply for domestic drinking water systems.

- Title 22, Division 4 Environmental Health includes Chapter 4 Water Treatment Devices, Chapter 13 Operator Certification (contains requirements for operating a water system), Chapter 14 Water Permits, Chapter 15 Domestic Water Quality & Monitoring Regulations, Chapter 16 California Waterworks Standards (sets forth criteria for distribution system design and construction standards), Chapter 17 surface Water Treatment (includes the provision of Article 7 to complete a Watershed Sanitary Survey)

- California Code of Regulations, Title 23, Administration of Water Rights

California Water Code largely administered by the State Water Resources Board has regulations regarding the appropriation of water for beneficial uses including the following:

- Division 2-Water, Part 2-Appropriation of Water, Chapter 2-Application To Appropriate Water; Section 1250-1276; Chapter 3-Notice of Application, Section 1300-1335; Chapter 6-Permits, Section 1375-1410.2.

5.15.1.5 Level of Significance Before Mitigation

San Bernardino General Plan

Upon implementation of relevant policies, programs, regulatory requirements and standard conditions of approval, the following impacts would be potentially significant:

GP Impact 5.15-1 The General Plan Update contains policies, and programs encouraging water conservation. Although analysis shows supplies may be adequate for the San Bernardino planning area, cumulative use of water in the Bunker Hill sub-basin by all surrounding water providers may cause stress on the basin and necessitate additional importation of water causing a potentially significant impact on water supplies for the region.

Arrowhead Springs Specific Plan

AHS Impact 5.15-1 The environmental impact of constructing of the water distribution system for the Arrowhead Springs Specific Plan project has been analyzed throughout this EIR as part of the development as a whole and calculation of “average” water supply indicates that a sufficient supply is potentially available. However, the system has not been permitted by the appropriate agencies and amount of water granted through existing water rights has not been definitively determined.

5.15.1.6 Mitigation Measures

San Bernardino General Plan

GP 5.15-1 In accordance with the State Water Code (Section 10610-10645), the City shall maintain an updated Urban Water Management Plan (Water System Management Plan) which describes and evaluates sources of supply, reasonable and practical efficient uses, reclamation and demand management activities, necessary to adequately serve future growth pursuant to the City's General Plan.

Arrowhead Springs Specific Plan

AHS 5.15-1 Prior to approval of the first Tentative Tract Map, evidence shall be provided to Public Works/Engineering that appropriate water rights have been granted through the State and the drinking water system has obtained all appropriate operating and design permits through the California State Department of Heath Services.

5.15.1.7 Level of Significance After Mitigation

San Bernardino General Plan

The mitigation measures identified above would reduce potential impacts associated with water supply and distribution to a level that is less than significant. Therefore, no significant unavoidable adverse impacts relating to water supply and distribution have been identified.

Arrowhead Springs Specific Plan

The mitigation measures identified above would reduce potential impacts associated with water supply and distribution to a level that is less than significant. Therefore, no significant unavoidable adverse impacts relating to water supply and distribution have been identified.

5.15.2 Wastewater Treatment and Collection

5.15.2.1 Environmental Setting

San Bernardino General Plan

Wastewater Treatment

The SBMWD owns and has operated the San Bernardino Water Reclamation Plant (WRP) also known as the Margaret H Chandler Water Reclamation Plant since 1973, treating both residential and industrial wastewater. The WRP treatment process includes screening, grit removal, primary clarification, activated sludge (biological oxidation) with nitrification and de-nitrification and secondary clarification, ensuring all water discharged into the Santa Ana River is properly treated. The WRP is a Secondary Treatment facility serving a population of over 185,000 including the cities of San Bernardino and Loma Linda, the East Valley Water District customers (some of which are within the City of San Bernardino), the San Bernardino International Airport, Patton State Hospital, and parts of San Bernardino County. The wastewater facility, which includes both primary and secondary treatment, has the capacity to process 33 MGD and currently processes 28 MGD. In March 1996, the City of San Bernardino and the City of Colton jointly opened the Rapid Infiltration and Extraction (RIX) facility, where secondary-treated water undergoes the final filtering and disinfecting process to produce wastewater that is superior or equivalent to that produced by conventional filtration systems and is suitable for recycling into the Santa Ana River. The RIX (tertiary treatment) facility has a capacity of 40.0 MGD and currently treats 32 MGD.

Wastewater Collection

In 2002 the City Public Works/Engineering Division prepared a master plan for the wastewater collection system that identified the existing conditions and potential improvements to the system (City of SB, 2002). This report, which is available at the Public Works/Engineering Division, has detailed mapping of the existing system. The collection system varies in size from 4" to 54". The report indicated that flows are fed into the WRP by three (3) trunk lines: Arrowhead, "E" Street, and the East Side trunks. The average inflows for the three trunk lines recorded by the City of San Bernardino Water Department are listed in Table 5.15-2.

Table 5.15-2
San Bernardino Wastewater Reclamation Plant Trunk Lines

Trunk Name/Location	Size (inches)	Material	Q_{avg}* (MGD)
Arrowhead: Arrowhead Avenue & Orange Show Road	54	RCP	8.04
"E" Street: "E" Street & Chandler Place	20	CI	3.06
East Side: Amos Avenue & Dumas Street	54	RCP	14.23

*Per the City of San Bernardino Water Department for the year 2001.

In addition to the flows generated by the City, the SBWRP also collects flows from the adjacent City of Loma Linda to the south and the East Valley Water District (EVWD) to the east. The City of Loma Linda uses two interconnections (18" and 21") to the City's collection system located south of the Interstate 10 Freeway just east of Waterman Avenue. These flows are routed to the WRP via the "E" Street trunk line where flows from the southern and south-central potion of the City are also collected. To the east, the EVWD uses a single 48-inch interconnection to the City's wastewater collection system. These flows are routed to the East Side trunk line along with the flows generated by the southeast corner of the City. The Arrowhead trunk line collects the remaining portion of the City that equates to 56 percent of the average annual total inflow into the WRP. The report also states that because the City is a foothill community there are various sized drainage channels cutting though that present problems for gravity fed pipelines causing the City to place many siphons and lift stations throughout. At the time the report was compiled it was estimated that there were 45,000 connections to the system served by San Bernardino and out of a total of 750,718 linear feet of pipeline, 49,345 feet of pipe was determined to have deficiencies in terms of pipe capacity.

The City Public Works/Engineering Division is responsible for the design, construction, maintenance and operation of wastewater collection facilities within the City service area. Other wastewater collection facilities within the City of San Bernardino are operated by the East Valley Water District (EVWD), San Bernardino International Airport and Trade Center, and the City of Loma Linda. The EVWD provides service to the eastern portion of the City of San Bernardino, Loma Linda provides service to the southern portion of the planning area and all wastewater obtained is routed to the City's collection facilities prior to treatment at WRP.

Septic Tanks

The City allows the use of septic systems on a limited basis as outlined in Section 13.31.500 of the City Municipal Code.

Septic tanks are permitted by the California Regional Water Quality Control Board pursuant to applicable City and County policies. Therefore, portions of the City's Sphere of Influence are being developed with septic systems.

Arrowhead Springs Specific Plan

The existing wastewater collection system is limited to the existing facilities within the developed area of Arrowhead Springs that covers about 200 acres. Primary treatment is provided by site Imhoff Tank style treatment plant located in the southern portion of the property. Discharge from the plant to adjacent settling ponds is permitted under Board Order No. 86-100 issued by the Santa Ana Regional Water Quality Control Board (SARWQCB). The Board Order allows a discharge of up to 300,000 gallons per day. Sludge disposal from the plant has been a concern in the past according to the Phase I Report prepared for the proposed project (See Appendix E). At times in the past sludge had been mixed with saw dust and used in the nearby field. More recently sludge has been accumulating in drying beds but the quantity of effluent treated has also been greatly reduced from previous years. Additional discussion of existing conditions regarding sludge can be found in Section 5.6, *Hazards and Hazardous Materials.*

5.15.2.2 Threshold of Significance

According to Appendix G of the CEQA Guidelines, a project would normally have a significant effect on the environment if the project:

WW-1 Would exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board.

WW-2 Would require or result in the construction of new wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.

WW-3 Would result in a determination by the wastewater treatment provider which serves or may serve the project that is has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments.

5.15.2.3 Environmental Impacts

The following impact analysis addresses thresholds of significance for which the Initial Study disclosed potentially significant impacts. The applicable thresholds are identified in parentheses after the impact statement.

San Bernardino General Plan

GP IMPACT 5.15-2: PROJECT-GENERATED WASTEWATER COULD NOT BE ADEQUATELY TREATED BY THE WASTEWATER SERVICE PROVIDER FOR THE PROJECT. [THRESHOLDS WW-1, WW-2, AND WW-3]

Impact Analysis: According to the 2000 US Census the population for the City of San Bernardino in 2000 was 185,401. The predicted population at build-out of the General Plan is 316,241persons which represents an increase of 70.5 percent over the 2000 Census population figure. No date has been established for when this build-out projection would occur. The WRP serves a larger population than the just the City of San Bernardino and the exact contribution of wastewater from the other jurisdictions has not been determined however San Bernardino is the largest contributor. If similar increases in population occur as well in those other jurisdictions that also utilize the WRP due to similar patterns of development as envisioned for San Bernardino, the existing flow to the WRP of 28 MGD could be expected to increase cumulatively by 20.2 MGD for a total flow of 48.2 MGD. This amount would exceed the existing design capacity of 33 MGD by 15.2 MGD. Using the same assumptions, the RIX facility would experience an increase of 23.1 MGD cumulatively, which would exceed the existing design capacity of 40 MGD by 15.1 MGD. Additional facilities would need to be built or expansion of existing facilities would need to be completed to accommodate the

proposed build-out in the service area of the WRP. Since the City is the largest contributor of wastewater flows to the WRP, the increase in population from build-out of the San Bernardino General Plan alone would most likely exceed design capacity of both facilities.

The wastewater collection system is currently experiencing deficiencies and the *Wastewater Collection System Master Plan* report of 2002 predicted an increase in system pipe capacity deficiencies to 57,022 out of 750,718 linear feet of pipe by the year 2025. That report was not based on the build-out projections presented in this EIR. It does provide a clear indication, however that the wastewater collection system could have even greater deficiencies if the General Plan is builds out as projected.

Relevant General Plan Policies and Programs

Utility Element

Policy 9.1.1: Provide for the construction of upgraded and expanded wastewater collection and treatment improvements to support existing and new development, and to meet usage requirements and maximize cost efficiency, especially in areas where existing systems are deficient.

Policy 9.1.2: Maintain and replace existing wastewater collection and treatment facilities as necessary.

Policy 9.1.3: Require new development to connect to a master planned sanitary sewer system in accordance with the City of San Bernardino Municipal Code. Where construction of master planned facilities is not feasible, the Mayor and Common Council may permit the construction of interim facilities sufficient to serve the present and short-term needs.

Policy 9.1.4: Evaluate the City's Sewer Collection System Master Plan and the Board of Water Commissioner's Master Plan for Wastewater Treatment Facilities as necessary to accurately determine which collection and treatment facilities will be needed to serve present and future growth in the City.

Policy 9.1.5: Review development proposals for projects within the City's Sphere of Influence and request the County to disapprove any project that cannot be served with adequate public wastewater collection and treatment facilities.

Policy 9.2.1: Provide for the monitoring of toxic or potentially toxic businesses to prevent contamination of water and wastewater.

Policy 9.2.2: Require, when necessary, pre-treatment of wastewater from industrial sources prior to treatment at the Water Reclamation Facility.

Arrowhead Springs Specific Plan

AHS IMPACT 5.15-2: PROJECT-GENERATED WASTEWATER COULD BE ADEQUATELY COLLECTED AND TREATED BY THE WASTEWATER SERVICE PROVIDER FOR THE PROJECT HOWEVER SOME RELATED FACILITY OPERATIONS MAY AFFECT THE ENVIRONMENT. [THRESHOLDS WW-1, WW-2, AND WW-3]

The amount of wastewater to be generated from the development is a function of the amount of wastewater discharged by each person, occupancy per dwelling unit and the amount of discharge from commercial areas which has been converted to "Equivalent Dwelling Units." The criteria used to develop the projected quantity of wastewater and the calculation of peaks flows can be found in Volume III, Appendix J. The average daily flow has been calculated to be approximately 889,920 gallon per day. The proposed wastewater treatment facility would be designed to accommodate 0.90million gallons per day which would be adequate to handle the projected generation of wastewater based upon engineering calculations. The proposed wastewater treatment plant and collection system would occupy an area within the footprint of

grading for the entire development. Therefore, impacts to the environment from construction of the wastewater treatment and collection system have been addressed throughout Chapter 5 as part of the overall analysis of the development (grading) footprint of the project. Potential impacts to air quality have been addressed in Section 5.2 of this EIR.

Although the wastewater treatment and collection system would be sized to accommodate the projected peak flow and be approved of the Public Works/engineering Division, some operational aspects have not been determined at this time, such as quantity and disposal location of sludge (bio-solids) and areas to be irrigated with recycled water. The proposed Arrowhead Springs development is located in a unique natural resources area and portions of the drinking water supply would rely on local streams. The intake for the drinking water on Strawberry Creek has not been identified. Bio-solids and the recycled water from the treatment plant used as irrigation water have the potential to affect the water quality of the local streams (and thus the drinking water supply) if not carefully controlled.

Effluent from the wastewater treatment system would be treated to recycled water standards and stored on-site for use as irrigation water. Therefore, no direct impact to local drainages from discharge would occur. However, the recycled water storage ponds would be located primarily in the area of the golf course, which may also be subject to flooding depending upon the design of the area which has not been determined. Under those circumstances downstream water quality could be affected. See Section 5.15.5 for additional details on recycled water.

The dismantling and disposal of the existing wastewater treatment plant may also have a potential effect on the environment which is discussed in Section 5.6, *Hazards and Hazardous Materials*.

5.15.2.4 Existing Regulations and Standard Conditions

San Bernardino General Plan

- The California Water Code which largely falls under the purview of the State Water Resources Board contains numerous regulations that pertain to wastewater treatment that would apply to any expansion of existing facilities or the construction of new facilities including the following:

- Division 7-Water Quality, Chapter 4-Regional Water Quality Control, Article 4-Waste Discharge Requirements, Section 13260-13274 concerns all discharge including bio-solids that have the potential to effect water quality; Chapter 7-Water Reclamation (Department of Health Services established criteria), Article 1-7, Sections 13500-13556 deals with all aspects of reclaimed water; Chapter 9-Waste Water Treatment Plan Classification and Operator Certification, Section 13625-13633 establishes requirements for operation of wastewater treatment plants.

Arrowhead Springs Specific Plan

- The California Water Code which largely falls under the purview of the State Water Resources Board contains numerous regulations that pertain to wastewater treatment that would apply to the Arrowhead Springs project including the following:

    - Division 2-Water, Part 2-Appropriation of Water, Chapter 1-General Provisions, Article 1.5–Treated Water, Sections1210-1212 deals with change in point of discharge of treated water.

    - Division 7–Water Quality, Chapter 4–Regional Water Quality Control, Article 4–Waste Discharge Requirements, Section 13260-13274 concerns all discharge including bio-solids that have the potential to effect water quality; Chapter 4.5–On-site Sewage Treatment; Chapter 7–Water Reclamation (Department of Health Services established criteria), Article 1-7, Sections 13500-13556 deals with all aspects of reclaimed water; Chapter 9–Waste

Water Treatment Plan Classification and Operator Certification, Section 13625-13633 establishes requirements for operation of wastewater treatment plants.

- To protect domestic water supply wells, recycled water used for irrigation must be constructed in accordance with Chapter 3 (commencing with Section 60301) of Division 4 of Title 22 of the California Code of Regulations. An approval of an "Engineering Report for the Production, Distribution and Use of Recycled Water" from the State of California, Department of Health Services, and Drinking Water Division would be required.
- Prior to construction a Wastewater Treatment Plant an air quality permit must be approved by the South Coast Air Quality Control District.

5.15.2.5 Level of Significance Before Mitigation

San Bernardino General Plan Update

Without mitigation the following impacts would be potentially significant:

GP Impact 5.15-2 Existing secondary and tertiary treatment facilities would exceed design capacity with build-out of the General Plan Update and wastewater collection systems would experience additional flow deficiencies.

Arrowhead Springs Specific Plan

Without mitigation the following impacts would be potentially significant:

AHS Impact 5.15-2 Construction of the wastewater collection and treatment facilities for the Arrowhead Springs Specific Plan project has been analyzed throughout this EIR where included as part of the grading footprint; however, operational impacts including use of recycled water may affect local water quality.

5.15.2.6 Mitigation Measures

San Bernardino General Plan

GP 5.15-2 The City of San Bernardino shall update the Wastewater Collection System Master Plan to reflect General Plan Update build-out statistics, review treatment facility capacity periodically and adjust Sewer Capacity Fees when appropriate in consultation with participating communities to accommodate construction of new or expanded wastewater treatment and collection facilities.

Arrowhead Springs Specific Plan

AHS 5.15-2 Prior to approval of the first Tentative Tract Map, evidence shall be provided to the Public Works/Engineering Division that appropriate permits have been obtained from the State Water Resources Board, the State Department of Health Services and the SCAQMD for the operation of the wastewater treatment plant including disposal of bio-solids and use of recycled water.

5.15.2.7 Level of Significance After Mitigation

San Bernardino General Plan

The mitigation measures identified above would reduce potential impacts associated with wastewater to a level that is less than significant. Therefore, no significant unavoidable adverse impacts relating to wastewater have been identified.

Arrowhead Springs Specific Plan

The mitigation measures identified above would reduce potential impacts associated with wastewater to a level that is less than significant. Therefore, no significant unavoidable adverse impacts relating to wastewater have been identified.

5.15.3 Solid Waste

5.15.3.1 Environmental Setting

San Bernardino General Plan

Solid waste collection within much of the City and a portion of the unincorporated planning area is provided by the Solid Waste Services and Refuse and Recycling Division of the City of San Bernardino Department of Public Services. Solid waste collection in the remainder of the planning area is provided by private haulers through franchise agreements with the City. According to the California Integrated Waste Management Board, residential land uses in the City of San Bernardino were responsible for disposing 58,454 tons of solid waste while businesses in the City were responsible for 136,392 tons of solid waste resulting in a total of 194,846 tons[5] of solid waste deposited in local land fills. This total amount represents a 45 percent reduction in the total amount of refuse produced due the waste diversion programs. With diversion the average amount contributed to landfills by each resident would be 2 pounds of solid waste per day or 730 pounds per year. Employees/businesses produced 13 pounds of solid waste per person per day or 4,745 tons per year after 45 percent waste diversion.

The County of San Bernardino Solid Waste Management Division (SWMD) is responsible for the operation and management of the solid waste disposal system which consists of six regional landfills, eight transfer stations and five community collection centers listed in Table 5.15-3. The County contracts with Burrtec Waste Industries for disposal site operations and maintenance. The City of San Bernardino has no active landfills but primarily utilizes the San Timoteo and Mid-Valley landfills. The San Timoteo Landfill is located in the City of Redlands, to the southeast of the City and the Fontana Sanitary Landfill (Mid-Valley) to the west of the City. The San Timoteo landfill is permitted to accept 1,000 tons per day and has an estimated capacity of 14,800,000 cubic yards, as shown in Table 5.15-3. The estimated remaining capacity is 6,372,281 tons and has an anticipated closure date of 2016. Mid-Valley is permitted to accept 7,500 tons per day of solid waste and has an estimated capacity of 62,000,000 cubic yards. The estimated remaining capacity is 23,949,691 tons and has an estimated closure date of 2033. The remaining landfills in the County, which could also be used by the City are also shown in Table 5.15-3, however most are reaching capacity.

[5] http://www.ciwmb.ca.gov/Profiles/Juris/JurProfile1.asp?RG=C&JURID=426&JUR=San+Bernardino, accessed February 17, 2005.

Table 5.15-3
Landfill Facilities Servicing San Bernardino and SOI

Facility	Capacity (cubic yards)	Permitted Daily Tonnage (tons)	Remaining Capacity (tons)	Closure Date
San Timoteo Sanitary Landfill	14,800,000	1,000	6,372,281	2016
Fontana Sanitary Landfill (Mid-Valley)	62,000,000	7,500	23,949,691	2033
Barstow Refuse Disposal Site	3,580,000	750[1]	400,836	2012
Landers Disposal Site	3,080,000	1,200[2]	703,698	2008
Colton Sanitary Landfill	13,297,000	3,100	940,260	2006
Victorville Refuse Disposal Site	7,700,000	1,600	1,126,285	2007
Total		**15,150**	**33,493,051**	

Regional planning for solid waste issues is conducted by the San Bernardino County Solid Waste Advisory Committee governed by the County Solid Waste Management Plan. The City of San Bernardino has a representative serving on the Solid Waste Advisory Committee. Any future solid waste facilities, such as transfer stations and/or landfills, must be incorporated in the County Solid Waste Management Plan.

California State Mandated Solid Waste Diversion

As landfills reach their capacities and new landfill sites become increasingly difficult to establish, the need to reduce solid waste generation is critical. State law currently requires that local jurisdictions divert at least 50 percent of their solid waste from landfills through conservation, recycling, and composting. Like all California communities, the City of San Bernardino is required to comply with State regulations.

Currently there are no collection service deficiencies and all sites utilized by the City are considered to be adequate. In 2002 the City of San Bernardino diverted 45 percent of their solid waste, 5 percent less than the 50 percent diversion rates required by the State of California. Table 5.15-4 following shows the board reviewed annual waste diversion rates for the City of San Bernardino. Local governments are subject to fines of up to $10,000 per day if the waste diversion goals are not met.[6] Since 1995, the City of San Bernardino has received either a Board Approved or Good Faith Effort in reaching waste diversion goals required by law[7].

[6] California Integrated Waste Management Board. Waste Reduction Policies and Procedures for State Agencies, August 1999. http://www.ciwmb.ca.gov/Publications/LocalAsst/StateAgency/44199017.doc

[7] California Integrated Waste Management Board
http://www.ciwmb.ca.gov/lgtools/mars/drmcmain.asp?ju=426&VW=In

Table 5.15-4
City of San Bernardino Waste Diversion Rates 1995–2002

Year	Diversion Rate
1995	23%
1996	35%
1997	44%
1998	43%
1999	46%
2000	46%
2001	45%
2002	45%
2003	42%[1]

Source: California Integrated Waste Management Board
[1]Based on preliminary data

Arrowhead Springs Specific Plan

Operations have been greatly reduced over that past few years at Arrowhead springs, limiting the amount of refuse produced by the resort area to just a few on-site residences and a small number of employees. Continued landscape maintenance of the facilities also produces a small quantity of "green" waste. Arrowhead Springs contracts with a private hauler who disposes three 1.5-cubic-yard containers of refuse and one 40-cubic-yard container of green waste in the San Timoteo landfill once a month.

5.15.3.2 Thresholds of Significance

SW-1 Would be served by a landfill with insufficient permitted capacity to accommodate the project's solid waste disposal needs.

SW-2 Would not comply with federal, state and local statutes and regulations related to solid waste.

5.15.3.3 Environmental Impacts

The following impact analysis addresses thresholds of significance for which the Initial Study disclosed potentially significant impacts. The applicable thresholds are identified in parentheses after the impact statement.

San Bernardino General Plan

GP IMPACT 5.15-3: EXISTING AND/OR PROPOSED FACILITIES WOULD BE ABLE TO ACCOMMODATE PROJECT-GENERATED SOLID WASTE AND COMPLY WITH RELATED SOLID WASTE REGULATIONS. [THRESHOLDS SW-1 AND SW-2]

Impact Analysis: Development of the proposed General Plan would increase the service demand on solid waste beyond existing conditions and further impact the San Timoteo Sanitary Landfill and Mid-Valley disposal sites. Upon build-out of the San Bernardino General Plan update, the maximum population within City and SOI could reach 316,241and businesses would generate approximately 355,629 employees. Utilizing the average daily rate of disposal of solid waste per person after diversion, it is estimated that at full

build-out of the General Plan update a total of approximately 2,617 tons per day would be placed in local landfills, as shown in Table 5.15-5.

Table 5.15-5
Household and Business Waste Disposal Rates for San Bernardino

Waste Stream	Existing Waste Stream (tons/year)	Waste Disposal Rate[1]	General Plan Projections[2]	Build-out Waste Stream (tons/year)
Household	58,454	0.365 tons/resident/year	316,664 (population)	116,523
Business	136,392	2.37 tons/employee/year	355,629 (employees)	842,840
Total	**194,846 (534 tons/day)**	—	—	**959,363 (2,628 tons/day)**

[1]Disposal rates are based on generation rate minus diversion rate
[2]General Plan projections include the City of San Bernardino and Sphere of Influence Area
Source: Generation Rates based off Waste Stream Profile for the City of San Bernardino from the California Integrated Waste Management Board

The San Timoteo Sanitary Landfill and Mid-Valley can accept a combined total of 8,500 tons of solid waste per day and has a combined estimated remaining capacity of 30,321,972 tons. In 2003, the San Timoteo Sanitary Landfill accepted less than 48 percent of daily permitted capacity or 174,562 tons out of a possible maximum of 365,000 tons. As shown in Table 5.15-6 the Mid-Valley Landfill accepted 619,382 tons in 2003 out of a possible maximum of 2,757,500 tons. Together the landfills have the permitted capacity to accept an additional 2,309,556 tons per year. The estimated daily disposal amount of 2,628 tons projected at full build-out of the General Plan represents approximately 31 percent of the current combined permitted disposal tonnage for the two main landfills. There is no specific date for maximum build-out to occur and it is assumed that amounts of refuse would increase gradually over a number of years before reaching the rate of 2,628 tons daily. Therefore, local landfills would be able to handle the amount of refuse from San Bernardino and other surrounding communities for some time and legislative requirements (see discussion below) are in place for planning of new landfills in advance of closure of existing landfills. Although the remaining County landfills (listed in Table 5.15-5 and Table 5.15-6) are nearing capacity and closure dates they do provide alternatives for disposal of waste that help to reduce reliance on the San Timoteo and Mid-Valley landfills, which may account for the lower than permitted disposal amounts.

Table 5.15-6
2003Landfill Facility Tonnage

Facility	2003 Tonnage Accepted	Permitted Tons per Year	Residual
San Timoteo Sanitary Landfill	174,562	365,000	191,438
Fontana Sanitary Landfill (Mid-Valley)	619,382	2,737,500	2,118,118
Barstow Refuse Disposal Site	78,378	273,750	195,372
Landers Disposal Site	62,369	438,000	375,631
Colton Sanitary Landfill	336,862	1,131,500	794,638
Victorville Refuse Disposal Site	285,160	584,000	298,840
Total	**1,745,237**	**5,529,750**	**3,784,513**

In addition, the City of San Bernardino Refuse and Recycling Division is continuing to participate and maintain AB 939 goals and guidelines. Solid Waste Services Division would continue to provide curbside recycling and green waste pickup for both commercial and household materials. Continuation of the recycling program and education on composting efforts would result in achieving the desired goal of 50 percent waste diversion in compliance with the Assembly Bill 939. Implementation of the City of San Bernardino General Plan would not hinder efforts to achieving this requirement as educational material on reducing waste, recycling and composting would be provided to commercial and residential users.[8]

The County of San Bernardino is required to enter into discussions with the California Integrated Waste Management Board and surrounding cities for a new waste disposal site within the region prior to the closure of an existing landfill. According to AB 939, jurisdictions are required to begin planning for new landfills when the jurisdiction's primary disposal site reaches its 15-year capacity. The challenge for San Bernardino, as well as communities throughout the State, is to continue to find diversion, recycling, and reuse strategies instead of relying on sanitary landfills as the primary method of managing solid waste. As the region grows, it becomes more difficult to site or expand landfills due to the unpopularity of these types of facilities. However; the planning process required by the legislature functions to mitigate potential impacts.

Relevant General Plan Policies and Programs

Utilities Element

Policy 9.5.1: Install and maintain public trash receptacles along incorporated City streets in commercial areas and along major arterials.

Policy 9.5.2: Provide regular street sweeping.

Policy 9.5.3: Continue to reduce the amount of solid waste that must be disposed of in area landfills, to conserve energy resources, and be consistent with the County Solid Waste Management Plan and State law.

Policy 9.5.4: Continue to support implementation of regional recycling programs through participation in the County Solid Waste Advisory Committee, the County Solid Waste Management Plan, and appropriate State programs.

Policy 9.5.5: Develop and participate in local recycling programs.

Policy 9.5.6: Develop and implement a program of public education regarding the benefits of recycling.

Arrowhead Springs Specific Plan

AHS IMPACT 5.15-3: EXISTING AND/OR PROPOSED FACILITIES WOULD BE ABLE TO ACCOMMODATE PROJECT-GENERATED SOLID WASTE AND COMPLY WITH RELATED SOLID WASTE REGULATIONS. [THRESHOLDS SW-1 AND SW-2]

Impact Analysis: According to the *Arrowhead Springs Annexation Study: Plan for Service* (see Volume III, Appendix K), no capital improvements are required in regards to solid waste management. The City provides both commercial and residential services on a fee basis[9] and would offer these services to the Arrowhead Springs development upon annexation. In addition, service for Arrowhead Springs would include implementation of recycling programs required by AB939.

[8] Integrated Waste Management District, 2003, http://www.ciwmb.ca.gov

[9] Residential – $19.86/month; Commercial – $101 to 883/month

To approximate the generation waste stream for Arrowhead Spring at a build-out of 4,233 residents and 2,530 employees, the same generation rates (including 45 percent reduction for diversion) for the City of San Bernardino have been used be used. The results are shown in Table 5.15-7.

Table 5.15-7
Household and Business Waste Disposal Rates for Arrowhead Springs

Waste Stream	Existing Waste Stream (tons/year)	Waste Generation Rate[1]	General Plan Projections	Build-out Waste Stream (tons/year)
Household	N/A	0.365 tons/resident/year	4,233	1,545
Business	N/A	2.37 tons/employee/year	2,530	5,996
Total	**N/A**	—	—	**7,541 (21 tons/day)**

[1]Disposal rates are based on generation rate minus diversion rate
Source: Generation Rates based off Waste Stream Profile for the City of San Bernardino from the California Integrated Waste Management Board

Implementation of the Arrowhead Springs Specific Plan would result in the generation of 21 tons per day of solid waste within the project area. Population and employment statistics for Arrowhead Springs have been incorporated into the build-out statistics for the San Bernardino General Plan update and thus included in the analysis of solid waste impacts for the City. The amount of refuse generated by the Arrowhead Springs development at build-out represents less that 1 percent of the total for the City which would be inconsequential.

5.15.3.4 Existing Regulations and Standard Conditions

- Assembly Bill 939 (Sher, Chapter 1095, Statutes of 1989), The Integrated Waste Management Act requires every California city and county to divert 50 percent of its waste from landfills by the year 2000. In addition, AB 939 requires each county, to prepare a Source Reduction and Recycling Element (SRRE) for its unincorporated area, identifying waste characterization; source reduction; recycling; composting; solid waste facility capacity; education and public information; funding; special waste (asbestos, sewage sludge, etc.); and household hazardous waste in addition to a countywide siting element, specifying areas for transformation or disposal sites to provide capacity for solid waste generated in the jurisdiction which cannot be reduced or recycled for a 15-year period.

5.15.3.5 Level of Significance Before Mitigation

San Bernardino General Plan

Upon implementation of relevant General Plan policies and programs plus regulatory requirements, and standard conditions of approval, the following impacts impact would less than significant:

GP Impact 5.15-2 Existing facilities have adequate capacity to accommodate solid waste disposal for a considerable length of time at the full build-out rate which would not happen for perhaps decades. The existing regulations (including AB 939) along with General Plan Update policies, and programs would serve to mitigate any solid waste disposal impact from full build-out of the General Plan.

Arrowhead Springs Specific Plan

Upon implementation of regulatory requirements and standard conditions of approval, the following impacts impact would be less than significant:

AHS Impact 5.15-2 The Arrowhead Springs Specific Plan would contribute less than 1 percent of the total solid waste stream calculated for the build-out of the General Plan update, which was determined to be less than significant. Therefore impacts due to build-out of the Arrowhead Springs development would also be less than significant.

5.15.3.6 Mitigation Measures

San Bernardino General Plan

No significant impacts were identified and no mitigation measures would be required for solid waste.

Arrowhead Springs Specific Plan

No significant impacts were identified and no mitigation measures would be required for solid waste.

5.15.3.7 Level of Significance After Mitigation

Impacts identified have been determined to be less than significant and no mitigation measures are required. Therefore, no significant unavoidable adverse impacts relating to solid waste have been identified.

5.15.4 Dry Utilities and Geothermal Energy

5.15.4.1 Environmental Setting

San Bernardino General Plan

Electricity

The Southern California Edison (SCE) Company provides electricity to San Bernardino's citizens, businesses and industry within the City and SOI. SCE owns, operates, and maintains both aboveground and underground facilities in the planning area. Most of SCE's facilities are located in the street right-of-way. SCE will extend electrical service into unserved areas pursuant to SCE's current Rules and Rates. The efficient use of energy and the building design/construction of buildings with energy efficiency in mind are vital to our future.

Electricity is transmitted through high voltage power lines and step-down transformers at the Devers substation near Desert Hot Springs and substations located within the City. High voltage transmission lines deliver power to the SCE substation located at the northwest corner of Monterey Avenue and Clancy Lane, where power is stepped down and distributed through lower voltage lines. Individual homes and businesses then receive power through a final transformer which brings voltages down to useful levels. Currently there are no known deficiencies in the Southern California Edison Company system.

Natural Gas

The Southern California Gas Company (The Gas Company) provides natural gas service to San Bernardino's citizens, businesses and industry within the City and SOI. The Gas Company owns, operates, and maintains underground gas lines in most of the public streets. There are no local natural gas producing wells within the City of San Bernardino planning area, therefore, the supply of natural gas is imported. The availability of natural gas service is based upon present conditions of gas supply and regulatory policies. As a public utility, The Gas Company is under the jurisdiction of the Public Utilities Commission and Federal regulatory

agencies. Should these agencies take any action that affects gas supply, or the conditions under which services is available, gas service would be provided in accordance with revised conditions.

Telephone

Verizon and SBC provide telephone service in the City of San Bernardino. Telecommunication companies are not regulated as to rates by the California Public Utilities Commission (PUC) but must be registered and certified to do business in the State of California and adhere to the Public Utilities Code. Rates are regulated by franchise agreements with the City of San Bernardino and Municipal Code Title 14, *Franchises*.

Cable

Adelphia Cable, Mountain Shadows Cable, and Charter Communications provide cable television service in the City of San Bernardino and surrounding communities. Cable Television is not classified as a "utility" and therefore is not regulated by the PUC but companies are required to have franchise agreements with the City and adhere to Municipal Code Title 14.

Geothermal Wells

Use of geothermal resources results in substantial energy savings and generates revenue for the City. As discussed in Section 5.5, *Geology and Soils a*pproximately 90 to 100 geothermal wells and springs have been identified in the San Bernardino area. The geothermal wells and springs are concentrated in the Commerce Center, Central City, and the Tri-City areas and the former Norton Air Force Base (see Figure 5.5-1). The San Bernardino Municipal Water Department (SBMWD) is operating two geothermal production wells which can pump 4,300,000 gallons of hot water per day. The usable supply of geothermal water, however, is much greater than what is currently used. The SBMWD uses geothermal resources to provide heat to over 35 offices and buildings including the Civic Center and National Orange Show in the central portion of the City. Use of geothermal heat has resulted in a substantial savings on winter heating bills where it is supplied.

Arrowhead Springs Specific Plan

Electricity

Electricity is currently supplied to Arrowhead Springs by SCE through contracts with Arrowhead Power and Water. Power is delivered primarily through overhead lines.

Natural Gas

The Southern California Gas Company provides natural gas to Arrowhead Springs.

Telephone

As with the City of San Bernardino, Verizon and SBC provide telephone service to the Arrowhead Springs area.

Cable

Adelphia Cable currently provides cable television and internet services to the project area via a single broadband network of coaxial and fiber-optic cable.

Geothermal Wells

Hot water from the geothermal resources on the Arrowhead Springs property is used to heat on-site facilities including the hotel, residences and swimming pool.

5.15.4.2 Environmental Impacts

The following impact analysis addresses the potential for impact to dry utilities.

San Bernardino General Plan

GP IMPACT 5.15-4: EXISTING AND/OR PROPOSED FACILITIES WOULD BE ABLE TO ACCOMMODATE PROJECT-GENERATED DRY UTILITY DEMANDS BUT GEOTHERMAL RESOURCES USED FOR ENERGY MAY BE AFFECTED BY BUILD-OUT OF THE GENERAL PLAN.

Impact Analysis: Build-out of the City of San Bernardino General Plan would result in increased demand for all dry utilities.

Build-out of the San Bernardino General Plan would necessitate the need for additional energy supply and energy transmission within the City. According to the Southern California Edison Company, they would be able to supply future growth within the City of San Bernardino with electrical power and all new development would be responsible for improvements to the electrical distribution infrastructure of that development.

The availability of natural gas service is based upon present conditions of gas supply and regulatory policies. As a public utility, the Gas Company is under the jurisdiction of the Public Utilities Commission and Federal regulatory agencies. Should these agencies take any action that affects gas supply, or the conditions under which service is available, gas service would be provided in accordance with revised conditions. As a result, The Gas Company and the Southern California Edison Company would be able to service the needs of the City of San Bernardino and SOI areas under the conditions of the General Plan build-out.

Build-out of the City of San Bernardino General Plan would result in an increased demand for telecommunication services such as telephone, cable, high speed internet, and other telecommunication services. Rate increases must be approved by the City; however, the ability to expand services is conditioned only by availability of capitol.

The geothermal resources located within the City that are used for generating heat can be affected by a number of factors including lowering the water level of the geothermal aquifer and drilling through the aquifer to colder water aquifers below.[10] The relationship between land use development and the diminishment of geothermal springs is less understood as suggested in Section 5.5, *Geology and Soils*. Some hot springs have disappeared and the temperature has been reduced in others, which affects the reliability of this natural resource as an alternative form of energy. Build-out of the General Plan could affect the use of this rare resource as a utility however the City has numerous regulations protecting this resource.

Relevant General Plan Policies and Programs

Utilities Element

Policy 9.6.1: Require that approval of new development be contingent upon the ability to be served with adequate electrical facilities.

[10] California Department of Mines and Geology. Resource Investigation of Low-and Moderate-Temperature Geothermal Areas in San Bernardino, California. DMG Open File Report 82-11, 1981.

Policy 9.6.2: Underground utilities, including on-site electrical utilities and connections to distribution facilities, unless such undergrounding is proven infeasible.

Policy 9.6.3: Provide adequate illumination of all streets, alleys (under special conditions), and public areas; upgrading areas that are deficient and maintaining lighting fixtures in good working order.

Policy 9.6.4: Require improvements to the existing street light system and/or new street light systems necessitated by a new development proposal be funded by that development.

Policy 9.6.5: Encourage and promote the use of energy-efficient (U.S. Department of Energy "Energy Star" or equivalent) lighting fixtures, light bulbs, and compact fluorescent bulbs in residences, commercial, and public buildings, as well as in traffic signals and signs where feasible.

Policy 9.7.1: Work with the Southern California Gas Company to ensure that adequate natural gas facilities are available to meet the demands of existing and new developments.

Policy 9.7.2: Require that all new development served by natural gas install on-site pipeline connections to distribution facilities underground, unless such undergrounding is infeasible due to significant environmental or other constraints.

Policy 9.8.1: Provide for the continued development and expansion of telecommunications systems including cable and, as feasible, fiber optics, for entertainment, education, culture, information access, two-way communication between government and residents and businesses, and other similar purposes.

Policy 9.8.2: Require that all new developments underground telecommunication facilities, unless such undergrounding is infeasible due to significant environmental or other constraints.

Policy 9.8.3: Cooperate with, and encourage public utilities to provide a fiber optics network in the City that is linked to regional systems.

Policy 9.9.1: Provide for the continued development and expansion of geothermal energy distribution lines.

Policy 9.9.2: Provide public funding to expand the existing geothermal production and distribution system.

Policy 9.9.3: Promote the use of geothermal resources particularly in the South San Bernardino Area.

Energy and Water Element

Policy 13.1.1: Reduce the City's ongoing electricity use by 10 percent and set an example for residents and businesses to follow.

Policy 13.1.2: Ensure the incorporation of energy conservation features in the design of all new construction and site development in accordance with State Law.

Policy 13.1.3: Consider enrollment in the Community Energy Efficiency Program (CEEP), which provides incentives for builders who attain energy savings 30 percent above the National Model Energy Code, the Energy Star Program, which is sponsored by the United States Department of Energy and the Environmental Protection Agency and encourages superior energy efficiency by residents and businesses, or the State's Energy Efficiency and Demand Reduction Program, which offer rebates and incentives to agencies and developers who reduce energy consumption and use energy efficient fixtures and energy-saving design elements.

Policy 13.1.4: Require energy audits of existing public structures and encourage audits of private structures, identifying levels of existing energy use and potential conservation measures.

Policy 13.1.5: Encourage energy-efficient retrofitting of existing buildings throughout the City.

Policy 13.1.6: Consider program that awards incentives to projects that install energy conservation measures, including technical assistance and possible low-interest loans.

Policy 13.1.7: Ensure that new development consider the ability of adjacent properties to utilize energy conservation design.

Policy 13.1.8: Educate the public regarding the need for energy conservation, environmental stewardship, and sustainability techniques and about systems and standards that are currently available for achieving greater energy and resource efficiency, such as the U.S. Green Building Council's "Leadership in Energy and Environmental Design" (LEED) standards for buildings.

Policy 13.1.9: Encourage increased use of passive and active solar and wind design in existing and new development (e.g., orienting buildings to maximize exposure to cooling effects of prevailing winds, day-lighting design, natural ventilation, space planning, thermal massing and locating landscaping and landscape structures to shade buildings).

Policy 13.1.10: Consider adopting an ordinance relating to energy conservation, environmental stewardship, and sustainability for new development that incorporates the LEED standards.

Arrowhead Springs Specific Plan

AHS IMPACT 5.15-5: EXISTING AND/OR PROPOSED FACILITIES WOULD BE ABLE TO ACCOMMODATE PROJECT-GENERATED DEMAND FOR DRY UTILITIES AND GEOTHERMAL RESOURCES USED FOR ENERGY.

Impact Analysis: Implementation of the Arrowhead Springs Specific Plan would result in increased demand for all dry utilities and dry utility infrastructure to supply those services would have to be expanded as well. Arrowhead Power and Water would be responsible for coordination of the expansion of those facilities and the operation and maintenance of some of those utilities. All of these utilities would be placed underground throughout the development in easements for that purpose and would be developed in conjunction with the development of the roadway system, where easements run concurrent.

As with the General Plan build-out, both SCE and The Gas Company have the ability to provide electrical and gas service but the supply maybe conditioned by the PUC and other regulatory agencies.

The remaining dry utilities have a similar ability to provide service to Arrowhead Springs and are only conditioned by their ability to fund the interconnections and operations.

As with the City of San Bernardino, the geothermal resources of Arrowhead Springs are used to off-set energy demand by proving a source of heat for buildings and hot water for pools and spa facilities. This resource has been historically the focus of this resort. Some research has shown that geothermal resources may be affected by intensified development of impermeable surfaces near the geothermal sources but other factors such as drilling through the hot aquifer may also contribute to the decline of geothermal springs. The exact relationship is not known. The majority of new development on the project site would occur away from existing geothermal wells and there are no current plans to drill new geothermal wells or wells through the hot aquifer.

5.15.4.3 Existing Regulations and Standard Conditions

- City of San Bernardino Municipal Code, Title 13, *Utilities,* Chapter 13.20, Geothermal Resources, establishes requirements for development, operation and preservation of geothermal resources.

- City of San Bernardino Municipal Code, Title 14, *Franchises,* establishes requirements for the development and operation of the telecommunication services including the need for an agreement establishing a rate structure and procedures for changing the rate structure.

5.15.4.4 Level of Significance Before Mitigation

San Bernardino General Plan

Upon implementation of General Plan policies and programs, regulatory requirements and standard conditions of approval, the following impacts would be less that significant:

GP Impact 5.15-5 There is no significant impediment to providing dry utilities for the build-out of the General Plan beyond supplies constrained by State and/or Federal regulatory agencies and no significant threat to the use of geothermal resources for energy.

Arrowhead Springs Specific Plan

Upon implementation of regulatory requirements and standard conditions of approval, the following impacts would be less that significant:

AHS Impact 5.15-5 Dry utilities can be provided to the proposed project unless constrained by State and/or Federal regulatory agencies and geothermal resources would not be affected by the development such that this resource would continue to be available to reduce the reliance on traditional forms of energy for heating.

5.15.4.5 Mitigation Measures

San Bernardino General Plan

No significant impacts were identified and no mitigation measures would be required for Dry Utilities.

Arrowhead Springs Specific Plan

No significant impacts were identified and no mitigation measures would be Dry Utilities.

5.15.4.6 Level of Significance After Mitigation

Impacts would be less than significant and no mitigation would be required. Therefore no significant unavoidable adverse impacts relating to dry utilities have been identified.

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