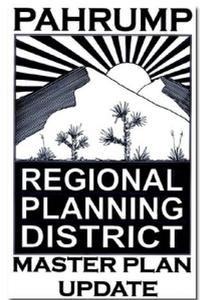


# Pahrump

## Regional Planning District



# Adequate Public Facilities Plan and Policy

August 7<sup>th</sup>, 2006  
5<sup>th</sup> DRAFT



**“Heart of the New Old West”**

# **Adequate Public Facilities Plan and Policy**

## **FINAL REPORT**

**5<sup>th</sup> Draft**  
August 7<sup>th</sup>, 2006

Prepared For:  
**Nye County, Nevada**

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**ADEQUATE PUBLIC FACILITIES PLAN AND POLICY  
Pahrump Regional Planning District  
Nye County, Nevada**

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## **ADEQUATE PUBLIC FACILITIES POLICY AND PLAN**

### **1.0 GOALS AND OBJECTIVES**

#### **1.1 Introduction**

Pahrump is an unincorporated town located in the southern portion of Nye County near the California border. Only 63 miles from Las Vegas, Pahrump is a bedroom community of sorts with thousands of residents who commute to Las Vegas each day. The rate of population growth has been a staggering 300% over the last 10 years, according to US Census data. This growth is placing pressure on Nye County and the Town of Pahrump to ensure that adequate public facilities are provided as the community grows.

In order to adequately provide for the health, safety, and general welfare, of the citizens of Pahrump, now and in the future, Nye County has taken the lead in developing a comprehensive approach to ensuring the necessary community facilities and services will be available as planned growth occurs. The planning and policies set forth in this document are intended to promote planned, rational, and affordable growth by supporting the progressive management and delivery of these necessary facilities and services.

Planning in the Pahrump Regional Planning District is only beginning to catch up with the population growth. With two zone categories, Highway Frontage and Open Use, regulating land use has become its priority. Incompatible land uses are common, resulting in a diminished sense of health, safety and welfare by the general public. Therefore, through the Master Plan Update process a general land use plan and zoning ordinance have been adopted along with recommended goals, objectives and policies to guide land use planning in the Pahrump Regional Planning District. As a result of the Master Plan Update the County has recommendations for staffing and implementation including an outline of the process for amending the existing zoning code. Having these elements of the Master Plan Update in place establishes the framework for developing a plan and policy for maintaining adequate public facilities during rapid growth.

#### **1.2 Service Provider Responsibilities**

Nye County through its governing Board of County Commissioners has department heads responsible for public facilities and services in the community including law enforcement (Sheriffs Department), natural resources and federal facilities, roads and traffic, drainage and flood control, and solid waste disposal. The Commissioners created the Pahrump Regional Planning District to focus on specific needs for the Pahrump Valley residents. The Town of Pahrump

operates with a Town Board and Town Manager responsible for the public facilities and services including parks and recreation that includes the County fairgrounds, social services, fire protection, and emergency services. The Nye County School District is governed by a Board of Trustees is responsible for providing the facilities and services to meet the primary and secondary education needs for school age children in the Pahrump Valley.

It has become more difficult for the County, the Town, and the School District to provide adequate public facilities and services in the face of the explosive growth. It is clear the time has come to develop a long range plan which identifies future infrastructure requirements and a comprehensive policy that will link the growth of new development with expansion of infrastructure and services. The steps to accomplish these goals and objectives include the following:

- Establish specific level-of-service standards for the various types of public facilities and services necessary to support urban development.
- Develop plans that identify future infrastructure requirements for public works and utilities.
- Prepare a policy document that sets forth both the standards to be met and the approval process to achieve a finding that adequate public facilities are available, or will be made available, concurrent with the impacts of the proposed development.

### **1.3 Level of Service Standards**

Level of service standards provide specific numerical terms describing the capacity of public facilities and services required to serve urban development. The facilities and services for which standards are proposed include:

- Roadways and Traffic Circulation
- Sanitary Sewerage
- Potable Water (including fire flow),
- Storm water Drainage and Flood Control,
- Refuse Collection
- Parks and Recreation
- Law Enforcement
- Fire Protection and Emergency Medical Service

It is recognized that the responsibilities for providing facilities and services to the public is divided among the various governmental jurisdictions and private utilities companies. Nonetheless, it is deemed appropriate that for this document an attempt be made to set forth proposed guidelines, standards, and policies that cover the broad spectrum of public facilities and services important to the health,

safety and general welfare of Pahrump Valley residents. Furthermore, the public process provided during the preparation of this document has provided opportunity for review and comments by major stakeholders and interested citizens that have been incorporated herein.

## **2.0 LONG RANGE GROWTH PROJECTIONS**

Long range planning for public facilities infrastructure and services requires projections of future population and land use for the Pahrump Regional Planning District. For the purposes of the Adequate Public Facilities Plan including master planning for future infrastructure needs, an ultimate population base of 150,000 persons distributed according to the land use types shown on the updated Land Use Map recently adopted by the Planning department. An ultimate population of 150,000 is based on estimates presented for the Pahrump Valley in the NYE County Water Resources Plan prepared by Thomas S. Buqo, August 2004. According to the report this population estimate correlates well with the population forecast by the REMI model used by the State Demographer and land based estimates using existing and future residential lots at 2.5 persons per residence.

The Land Use Map is a useful tool for estimating future demands that determine the infrastructure requirements for such public facilities as roadways, water and sewer services. Given an area with land use types, densities, and other related criteria, yields the number of housing units or population for residential and square feet of business space or number of employees for commercial development. To avoid the faulty “total build-out” method advised in the Population Projections and Landuse Assumptions prepared by Consensus Planning, February 15, 2005 and “calibrate” the land use map for infrastructure planning purposes certain assumptions had to be made and the land use criteria adjusted to yield a total population of 150,000 persons at an average of 2.4 persons per household. Except for some high density subdivisions existing or planned that are handled differently, it was assumed that all residential development was fully built out. Residential dwelling unit densities for the different land use types were adjusted within reasonable limits to yield the ultimate resident population of 150,000. For commercial development a build out of 50% was assumed resulting in an amount of business space and number of employees that appears reasonable for a community of 150,000. As a result the commercial land use yielded an estimated 29,500 Ksf of business floor space based on an average 10% floor space per acre with an estimated 65,500 employees at an average of 2.2 employees per 1,000 square feet of floor space.

As is discussed above the results of the population projection calibration is further discussed in Tables 1 and 2. Table 1 shows each residential land use in relation to their prospective area, density and resulting population, whereas Table 2 shows each commercial land use in relation to their prospective area, density and resulting population.

**Table 1 - Land Use Based Population Projection**

Residential Land Uses	Land Use Area(Acres)	DU/Ac	Total DU	Population
Rural Residential	18,500	0.10	1,850	4,370
Low Density Residential	34,200	0.40	13,680	32,280
Medium Density Residential	21,000	1.50	31,500	74,340
Multi-Family Residential	300	8.00	2,400	5,660
Commercial/Mixed Use (Residential, 85%)	10,200	1.40	14,280	33,700
<b>TOTALS=</b>	<b>84,200</b>		<b>63,710</b>	<b>150,350</b>
Population calculated at 2.36 Persons / Dwelling Unit, 2000 Census data				

**Table 2 - Land Use Based Employee Projection**

Residential Land Uses	Land Use Area(Acres)	Floor Space (ksf)	Total DU	Population
Commercial/Mixed Use (Commercial, 15%)	950	4,100	8.0	7,600
General Commercial	2,230	9,700	8.0	17,840
Business Parks	2,150	9,400	12.0	25,800
Heavy Industrial	1,100	4,800	5.0	5,500
Municipal	350	1,500	25.0	8,750
<b>TOTALS=</b>	<b>6,780</b>	<b>29,500</b>		<b>65,490</b>
Commercial acres shown are 50% of Land Use Map.				
Floor Space calculated at FAR = 10%				

Please note that results discussed through out this report are shown rounded to one or two digits using Microsoft Excel software. However the analysis or results are calculated using their ultimate decimal place; therefore sums and products generated in the report may not equal the sum or products replicated by the reader with the factors shown in the report due to rounding error.

### **3.0 DEVELOPMENT OF PLANS**

To date, long range regional planning efforts for public works and utilities infrastructure improvements within the Pahrump Regional Planning District have been minimal. Currently, the sanitary sewerage and potable water infrastructure is provided by a number of independent private utilities companies, making regional planning for these utilities non-existent.

The County has taken the lead by giving birth to this Adequate Public Facilities Plan & Policy in developing plans for each of the major public facilities with an effort to establish goals, objectives, and policies relative to maintaining a standard level of service for both current and future residents of Pahrump. In addition, an assessment of current system capacities and a long range planning level determination of future infrastructure requirements have been developed. These plan elements are intended to be used as a planning tool to help maintain services to existing residents and businesses as well as provide for new development within Pahrump. Nye County is keenly aware of the benefits of planning and the effects it has on preservation of the environment, resident lifestyles, economic well-being of residents, and economic development within Pahrump.

The purpose of these plans is to provide a technical basis for infrastructure planning and establish policies which:

- Identify desired courses of action or strategies, which provide the means to implement the community's infrastructure and public services policies.
- Provide for a staged and coordinated system of infrastructure improvements and public services upgrades to adequately serve Pahrump.
- Identify standards for infrastructure and public services relative to population, land use intensity, and locational criteria

Expansion of infrastructure and public services will need to be coordinated between Nye County, the Town of Pahrump, the School District and private utility providers for maximum benefit to all end users. The Adequate Public Facilities Plan and Policy is a long-range policy plan designed to help decision makers of all kinds make the day-to-day decisions that add up the future of the community.

#### **3.1 Plan Goals, Objectives, Purposes, Policies and Implementation**

In general each plan explains the facility area by providing the thought process behind the communities needs. This is best communicated by a itemized listing

of each community goal and action plan to achieve that goal. The list is as follows:

**GOAL #:** Provide a service to residential and non-residential structures within the community.

**Objective-A:** Provide a service to establish public health and safety.

**Purpose:** The purpose of the following policies is to meet the specific community need with high quality and adequate service that assures public health and safety.

**Policy 1:** It is the policy of the county to accomplish a task.

**Implementation Action:**

Plan: An entity shall take the necessary steps to develop a facilities plan. The necessary steps to accomplish this task are outlined below.

- Utilize technology or work plan to accomplish the task.
- Pursue the creation of public programs or board to accomplish the task.
- Discuss the creation of a capital municipal system to accomplish the task.

## **4.0 CAPITAL IMPROVEMENT PROGRAMS DEVELOPMENT**

After adoption of the Adequate Facilities Policy and Plan the County will be in a position to develop comprehensive Capital Improvement Programs (CIP). In general CIP planning requires engineering studies to define the infrastructure needs at a 10-year planning horizon followed by more refined analysis and prioritization to select specific projects for implementation in the near term. The Capital Improvement Program is typically a five to ten-year plan ranging from the identification of typical costs to how and when money will be spent for anticipated projects. The program addresses not only the modification and replacement of existing infrastructure, but also possibly the development of new facilities. Each individual Capital Improvement Program is tailored for each facility, but typically identifies facilities, quantifies existing system capacities, develops a plan for future expansion, and prepares a strategy to integrate, connect or retire the existing facilities into a municipal system.

The program enables the responsible entity to identify needed projects and to coordinate financing and timing of construction. The CIP has two parts: a procedure to identify and prioritize future projects and a fiscal plan to provide for the funding of these

projects. During periods of rapid growth the anticipated needs for new infrastructure will play a large part in the development of a Capital Improvement Program. A comprehensive CIP is necessary for establishing the rates for impact fees paid by new development that is typically a primary funding source for design and construction of new infrastructure.

The potential to utilize creative financing techniques in the provision of utility facilities and public services for economic development purposes should be evaluated. This can be addressed in a Capital Improvement Plan or separate document, which is typically developed after the adoption of this report. Adequate levels of public safety should be maintained commensurate with growth.

Capital Improvement Programs typically a five-year or ten-year plans that identifies how and when money will be spent for anticipated projects. An effective CIP process is an important tool to promote advanced planning of future needs and the means to meet those needs. As a planning tool, the CIP insures that projects are coordinated and well-timed to avoid or sometimes costly duplications.

In the application of the CIP Projects, the first year or current year of a CIP is then typically financed by the overseeing agency conducting the planning and are part of that year's capital budget. Financing has not been secured or authorized for the remaining four to nine years worth of projects, because these are projected and subject to change.

Capital Improvement Programs are also typically open to change and updated yearly to accommodate the ever varying needs and priorities of the population they ultimately serve. The differing departments and other agencies submit projects every year to the CIP project evaluation committee, which is made up of senior county staff. These proposed projects are evaluated based on predetermined and weighted criteria.

These criteria include:

- Facility Significance – General Future Benefits
- Coordination with other CIP projects – General physical constraints
- Lands Need – Availability of physical land to construct the facility
- Land Use Planning– General regional plan and anticipated growth Relationship.
- Annual Funding Projections – Timing of funds available annually

## **5.0 ADEQUATE PUBLIC FACILITIES PLANNING AND POLICY**

Nye County and Town of Pahrump must cooperatively develop level-of-service standards for public services and infrastructure as a part of the policies governing growth management.

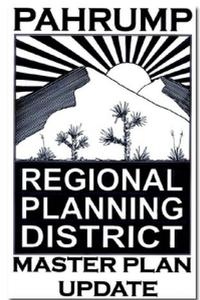
This Adequate Public Facilities Plan contains five sections they are as follows:

- **STREETS AND HIGHWAYS PLAN**
  - Roadway and Traffic Circulation Planning
- **SANITARY SEWER SYSTEM PLAN**
  - Sanitary Sewer Collection System Planning
- **WATER DISTRIBUTION SYSTEM PLAN**
  - Potable Water Distribution System Planning
- **STORM WATER DRAINAGE AND FLOOD CONTROL PLAN**
  - Hydrologic Conditions and Analysis
- **ADEQUATE PUBLIC FACILITIES POLICY**
  - Administration, Policy and Standards

Each section contains the text and tables necessary for that particular plan

# Pahrump

## Regional Planning District



# Streets and Highways Plan

August 7th, 2006  
5th DRAFT



**“Heart of the New Old West”**

# **Street and Highways Plan**

## **FINAL REPORT**

**5<sup>th</sup> Draft**  
August 7<sup>th</sup>, 2006

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**STREETS AND HIGHWAY PLAN  
Pahrump Regional Planning District  
Nye County, Nevada**

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## **STREETS AND HIGHWAYS PLAN**

### **1.0 INTRODUCTION**

Nye County's vision for future traffic circulation systems will provide a network of transportation options that provide for safe and adequate traffic flow, while embracing the policies of the Land Use Master Plan. Circulation system improvements will be implemented to improve mobility for all persons in the community, and incorporate design elements, which enhance the image of the community. Alternative modes of transportation such as biking and walking will be encouraged. The County will encourage innovative neighborhood designs that provide an integrated pedestrian and bicycle network that connects schools, residences, and employment areas throughout the community.

The Transportation Element of the Pahrump Regional Planning District PLAN Update identifies and establishes the policies governing the system of roadways, sidewalks, bike paths, and other components for the circulation system of the area. These elements collectively provide for the movement of persons and goods throughout Pahrump. The purpose of the Circulation Element is to establish an official Nye County policy that:

- Identifies the network of facilities required to serve anticipated vehicular and non-vehicular travel demand in Pahrump.
- Identifies the linkage between alternative modes of transportation and the development of the circulation system to establish feasible multi-modal and public transportation strategies.
- Identifies desired courses of actions or strategies, which provide the means to implement Pahrump's circulation system.

The Pahrump Valley continues to experience growing transportation demands as indicated by records obtained from the Department of Motor Vehicles and the Nevada Department of Transportation. There were 46,288 active vehicle registrations in Nye County as of January 2003, representing an increase of approximately 69% since 1993. Average Annual Daily Traffic (AADT) on State Highway 160 just south of State Road 372 has increased by approximately 55% since 1993 while AADT on State Road 372 just west of State Highway 160 has increased by approximately 89% since 1993. Understanding the existing transportation conditions and anticipating the future transportation needs of the community is vital in order to effectively accommodate the increasing transportation demands of Pahrump. This section identifies existing transportation conditions and outlines the goals, objectives and actions to be taken in developing a comprehensive transportation plan for Pahrump.

## **2.0 EXISTING STREET AND HIGHWAY NETWORK**

The existing transportation network in Pahrump centers on the primary north/south and east/west mobility corridors of State Highway 160 and State Road 372, respectively. These roadways and all intersections with these roadways are under the authority of the Nevada Department of Transportation. While significant sections of SR 160 and SR 372 are two-lane roadways with minimal shoulders, the Highways provide up to four travel lanes with full auxiliary turning lanes within the central business district of Pahrump. State Highway 160 provides direct access to Interstate-95 north of Pahrump and connectivity with Las Vegas to the southeast. State Road 372 provides a direct route into California. There are two signalized intersections in Pahrump including the intersection of State Highway 160/State Road 372 and the intersection of State Highway 160/Basin Road. Each of these signalized intersections provide a full complement of control technology including Optical Priority Control System for emergency vehicles, pedestrian crosswalk signal heads, video detection systems and illuminated signage. Aside from State Roads 160 and 372, the vast majority of existing roadways in Pahrump provide two travel lanes with stop sign-controlled intersections and minimal shoulders. Direct access has not been restricted to a significant degree on any of the roadways.

## **3.0 EXISTING TRANSPORTATION PLAN**

The Nye County Street and Highway Plan was completed in 1993 by Lumos & Associates, Inc. and included a recommended transportation plan for Pahrump as well as general roadway classification and cross-section standards applicable County-wide. The 1993 Nye County Street and Highway Plan includes the following definitions for a roadway classification system. This plan has recently been updated by Lumos and Associates:

- **Urban Arterials:** Urban arterial routes serve the major activity centers of an urban area and consist mainly of the highest traffic volume corridors. These routes carry the most trips with an origin or destination within the urban area, including primary destination points for residential and commercial traffic. The principal objective of streets within this classification is to move high volumes of traffic quickly and efficiently. They serve as a primary distribution system to and from freeways and expressways and should be strategically placed to provide parallel alternate routes for when those higher classification roadways become congested. They can provide for interregional, intra-regional, inter-city and intra-city travel needs of regional or State significance. Access to major arterials is limited and direct lot access is prohibited.
- **Urban Collector:** The main purpose of streets within this system is to collect traffic from local streets in residential areas or central business districts and convey it to the arterial system. Collector streets usually go through residential

areas and facilitate traffic circulation within residential, commercial and industrial areas.

- Rural Collector: The rural collector routes generally serve travel of primarily intra-county rather than statewide importance. These routes serve traffic generators of intra-county importance such as shipping points, county parks, and important mining and agricultural areas. Additionally, they link towns with routes of higher classification and primary destination points for residential and commercial traffic.
- Urban Local: The primary purpose of these streets is to provide access to abutting land and connection to the collector streets. Through traffic is deliberately discouraged on these streets.
- Rural Local: The rural local road system primarily provides access to land adjacent to the collector network.

The Pahrump Regional Planning District Division of Land and Planned Unit Development Ordinance refers to the Nye County Street and Highway Plan and the aforementioned roadway classification system for new development within the Pahrump Valley.

## **4.0 NON-MOTORIZED CIRCULATION**

Non-motorized circulation, including bicycling, walking and equestrian trail modes can provide efficient and enjoyable means of transportation and recreation for people of all ages. Pahrump has numerous opportunities to establish bikeways, pedestrian and equestrian facilities along streets, utility easements, drainage corridors, and scenic off-road areas. A bikes and trails map has been included in the plan. [See Roads Figure #1, Pg 23]

## **5.0 AIR TRANSPORTATION**

Nye County commissioned an airport site selection study for the Pahrump Valley, which was completed by Aries Consultants Ltd. in March 1987. The study was part of a County-wide Airports Master Plan study and included the analysis of two Airport sites: Site A which is the existing airstrip north of the center of town, and Site B south of Gamebird Road and West of Pahrump Valley Boulevard. The report indicated that the Pahrump Town Board voted to recommend the selection of Site B as the Airport site. Site B is located on land under the jurisdiction of the Bureau of Land Management. Since the time of the approval of Site B, the BLM has requested moving the site to a different location in order to protect two plant species (Honey Mesquite and Pahrump Valley Buckwheat) and a bird species that lives in them. The Pahrump Town Board

agreed to move the site and a new site, called Site C, was chosen. The location of Site C was finalized in 2000 and is in the same general area as Site B. Site C is shown on the Land Use Map and designated an Airport Study Area.

The Pahrump Town Board has received a grant from the Federal Aviation Administration (FAA) to prepare an Airport Master Plan for Site C. Nye County discontinued its pursuit of constructing an airport in Pahrump and the Town Board has taken on the project. Nye County should coordinate with the Town and Aries Consultants to ensure compatible uses and development requirements are in place that do not adversely affect the airport.

## **6.0 TRANSIT SERVICES**

As Pahrump continues to grow there will be a continuing demand for public transit. The Pahrump Valley does not provide any regularly scheduled mass transit services for local mobility. Public transportation will help reduce traffic congestion and air pollution. The following alternatives are currently available for citizens without access to an automobile:

- **Pahrump Helping Hands**  
Provides transportation for poor, elderly and disabled individuals to medical appointments. Service is funded by United Way of Southern Nevada under the Salvation Army Clark County Command.
- **Pahrump Valley Taxi**  
Provides 24-hour on-call private transportation throughout the Pahrump Valley. Ridership for Year 2002 was approximately 20,000.
- **Pahrump Senior Center**  
Provides on-call transportation services for area seniors. Appointments must be scheduled 24-hours in advance and fees are \$2.00 per stop.
- **Fresh Air Accessible Transportation**  
Provides transportation to and from health care appointments for members of the Sierra Health HMO. Services are available 7-days a week and appointments must be scheduled 24-hours in advance.

## 7.0 TRANSPORTATION GOALS, OBJECTIVES, PURPOSES, POLICIES AND IMPLEMENTATION

**GOAL #1:** Promote a transportation system of arterial, collector and, local streets capable of accommodating the anticipated travel demands of the Pahrump Regional Planning District in a safe, efficient manner.

**Objective-A:** Develop a hierarchy of roads that recognizes the importance of the use and function of each roadway classification.

**Objective-B:** Design roadway standards for arterial, collector, and local streets that reflect anticipated travel volumes based upon development densities and the unique rural and urban character of the Pahrump Valley and make provisions for growth beyond the planning life cycle.

**Objective-C:** Acquire right-of-way to expand the roadway network by widening highly traveled and centrally located roads.

**Objective-D:** Progressively plan and develop a network of arterial streets that provide a high level of mobility for local and through traffic with restricted access to adjacent properties.

**Objective-E:** Specify appropriate guidelines regarding driveway access points, street intersection spacing and corner clearance to maintain efficient and safe traffic flow in the Streets and Highways Plan.

**Objective-F:** Establish a series of collector roadways that distribute traffic to and from neighborhoods to arterial streets without encouraging through traffic.

**Objective-G:** Ensure that local streets in Low and Very Low Density Residential areas (1 acre minimum lot size or greater) enhance the rural character of Pahrump through the development of a rural road standard.

### **Purpose:**

The purpose of the following policy is to meet and or exceed the growing transportation demands of the Pahrump Valley. Maintenance and expansion of a transportation network that includes arterial, collector and local streets will be necessary.

**Policy 1:** It is the policy of the County to develop a Transportation PLAN in collaboration with Las Vegas and Clark County.

### **Implementation Action:**

Traffic Impact Analysis: The following sequential steps have been or will be taken in developing a traffic impact analysis for Pahrump:

- Conduct traffic volume counts throughout Pahrump including 24-hour counts on critical existing and proposed arterials and peak-hour turning movement counts at critical intersections.
- Calculate full-build out trip generation based upon projected land uses and densities.
- Identify existing traffic distribution patterns and anticipate future circulation needs.
- Perform Level of Service calculations for all critical roadway segments with existing and future traffic volumes. Provide recommendations for infrastructure improvements required to maintain acceptable Levels of Service.
- Develop a complete hierarchical roadway classification system based upon existing traffic volumes, anticipated future trip generation and current roadway classifications for Nye County. The classification system will include detailed access limitations contingent upon Average Daily Traffic volumes.
- Develop roadway construction standards including typical cross-sections based upon the completed hierarchical roadway classification system. All roadway standards will be in conformance with the American Association of State Highway and Transportation Officials (AASHTO) and will be based upon functional classifications as well as estimated future traffic volumes. Where appropriate, the typical cross-sections will include accommodations for non-motorized modes of transportation such as bike lanes, sidewalks and roadside equestrian trails.
- Develop a Capital Improvement Program (CIP) structure that can accommodate the findings and recommendations of the Traffic Study as well as the findings and recommendations of the Lumos and Associates update to the Nye County Street and Highway Plan.

**GOAL #2:** Study the merits and drawbacks of air-service for the Pahrump Regional Planning District among neighborhoods and stakeholder groups.

**Objective-A:** Complete the Federal Aviation Administration study for a general Aviation Airport at the previously selected site in Southwest Pahrump.

**Objective-B:** Provide for the vital economic and transportation-related future of Pahrump by either expansion of the existing private airport or creation of a new airport.

**Purpose:**

The purpose of the following policy is to ensure communication and informed decision making among the various stakeholders in the possible development of air-service in the Pahrump Valley.

**Policy 1:** It is the policy of Nye County to participate in discussions with the Federal Aviation Administration, the Pahrump Town Board, the Bureau of Land Management, neighborhood groups, and other stakeholders regarding land use mapping and zoning in areas around the proposed airport site.

**Implementation Actions:**

Airport Task Force: In coordination with the Town of Pahrump and their airport consultant create a task force that includes the Nye County representatives, the Federal Aviation Administration, the Bureau of Land Management, neighborhood groups and any other stakeholders. The Task Force will continually meet, communicate issues and make recommendations on relevant actions to air-service development for the Pahrump Valley.

**GOAL #2:** Provide non-motorized modes of transportation through the use of bicycle and pedestrian pathways, and equestrian trails.

**Objective-A:** Facilitate the use of alternative, non-vehicular modes of transportation by establishing specific and conceptual bicycle corridors throughout Pahrump.

**Objective-B:** Promote the development of equestrian trails as a safe and convenient mode of transportation and recreation.

**Objective-C:** Establish specific and conceptual trail corridors throughout Pahrump.

**Objective-D:** Connect specific and conceptual trail corridors to community facilities, existing trail networks, appropriate federal land, and clusters of horse properties.

**Objective-E:** Explore opportunities to utilize all possible open spaces for non-motorized modes of transportation, including sharing of utility and drainage easements and corridors.

**Purpose:**

The purpose of these policies is to provide Pahrump residents with non-motorized modes of transportation through the use of bicycle and pedestrian pathways and through equestrian trails. Such transportation options will provide opportunities for recreation, fitness and alternative, non-vehicular modes of transportation.

**Policy 1:** It is the policy of Nye County that bicycling shall be encouraged to provide a safe and healthy alternative to automobile transportation in Pahrump.

**Policy 2:** It is the policy of Nye County that the following types of bicycle facilities shall be identified in this Streets and Highways Plan.

- **Bike Path** - A bike path is a special pathway designated for the use of bicycles (and pedestrians) where cross flows by motorists are minimized. Bike paths are usually buffered from vehicular roadways by the use of a landscape strip or physical buffer. Bike paths may be totally separated from roadways, and utilize drainage easements, utility corridors, linear parks or other easements for the path. Some areas may have paved paths while others may consist of natural material or other surfaces.
- **Bike Lane** - A bike lane is a paved lane on the shoulder of a roadway that is marked for bicycle use only. Bike lanes may be found on arterial and collector streets, and are marked to alert both bicyclists and motorists that each is sharing the roadway. Bicycle lanes may be established on arterial roadways with sufficient pavement width to allow for the safety of the bicyclist.
- **Bike Route** - A bike route is a roadway identified as a bicycle facility by signs only. Bike routes may be identified on local streets, and collector streets where traffic volumes are modest.

**Policy 3:** It is the policy of Nye County that when determining location of bike paths, lanes and routes as well as equestrian trails on selected streets and corridors the following factors shall be considered in the most appropriate location for bikeways, paths and trails.

- Street Classification
- Pavement width
- Number of traffic lanes
- Average daily traffic volumes
- Posted speed limits
- On-street parking

**Policy 4:** It is the policy of Nye County that all new arterial and collector streets shall have improved sidewalks within the public right-of-way on both sides of the street when the street is built to ultimate specifications.

**Policy 5:** It is the policy of Nye County that, where appropriate, practical and economically feasible, off-road trails shall accommodate horseback riding.

**Implementation Actions:**

Non-motorized Transportation Guidelines: The Nye County in collaboration with the Nye County Planning Department and Public Works Department shall prepare minimum design guidelines for non-motorized transportation infrastructure and trails.

Trail Corridor Identification: The Nye County in collaboration with the Nye County Planning Department and Public Works Department shall identify and designate a comprehensive network of trail corridors based on existing and planned utility corridors, parks and public properties.

## **8.0 TRIP GENERATION**

Estimates of the traffic generated by both the current and proposed land-use designations in Pahrump were developed based upon trip generation rates contained in the 6th Edition, 1997, of Trip Generation Manual, published by the Institute of Transportation Engineers. The results are presented in the tables entitled Trip Generation – Existing and Trip Generation – Year. [See Roads Figure #2 & Roads Figure #3, Pg 24 & 25] For the planning horizon of Year 2025, a target population of 75,000 was applied which corresponds to a utilization factor of approximately 25% of the total area of each land-use designation on the proposed Land Use map. The trip generation estimates indicate Pahrump is currently producing approximately 178,000 vehicle trips per day. By Year 2025, that number is expected to increase to approximately 676,000 vehicle trips per day. This increase corresponds to an annual growth rate of just under 7 percent.

## **9.0 TRAFFIC VOLUMES**

Traffic volume counts were conducted on 26 road segments throughout the existing Pahrump roadway network. Technical data use in the creation of this Plan, which includes the traffic counts for 24-hour periods for the 26 roads. The existing traffic volumes helped to establish a baseline for determining future traffic volumes. Applying the aforementioned annual growth rate of 7 percent to the existing 24-hour traffic volume results in estimated 24-hour traffic volumes for the Year 2025. These future traffic volume estimates are illustrated in ROADS FIGURE #4 & 5.

## **10.0 ACCIDENT ANALYSIS**

Accident data compiled from the Nye County Sheriff's Department is illustrated in the figure Accident Analysis Map. [See Roads Figure #6, Pg 28]. The data was compiled from accidents reported between December, 2002 and June, 2003. There were a total of 20 intersections with three or more accidents with the highest number of accidents-13, reported at the intersection of State Road 160/State Road 372. The intersection of Pahrump Valley Boulevard/State Road 372 had the second highest number of reported accidents with 12. The accident data do not appear disproportionate to the associated traffic volume and therefore do not indicate an atypical accident profile for Pahrump. The intersection of Pahrump Valley Boulevard/SR 372 reported a significantly higher number of accidents than any other un-signalized intersection and therefore may warrant a safety analysis investigation.

## **11.0 PROPOSED ROADWAY CLASSIFICATION SYSTEM**

A roadway classification system allows for a balance between the efficient through movement of traffic and direct access to adjacent property. The following four roadway classifications are proposed for Pahrump:

### **11.1 Major Arterial**

The principal objective of streets within this classification is to move high volumes of traffic quickly and efficiently. They serve as a primary distribution system to and from freeways and expressways and should be strategically placed to provide parallel alternate routes for when those higher classification roadways become congested. They can provide for interregional, intra-regional, inter-city and intra-city travel needs of regional or State significance. Access to major arterials is limited and direct lot access is prohibited. [See Roads Figure #7, Pg 29]

### **11.2 Urban and Rural Minor Arterial**

While Minor Arterials are also primarily designed for mobility, they simultaneously provide an important land access function. Although direct lot access is prohibited, intersection spacing is allowed more frequently at an average of  $\frac{1}{4}$  of a mile where major arterials have an average intersection spacing a  $\frac{1}{2}$  of a mile. Minor arterials provide connectivity between major arterials and lower roadway classifications. [See Roads Figure #8 and Roads Figure #9, Pgs 30, 31]

### **11.3 Urban and Rural Collector**

Streets within this classification are designed to collect traffic from residential and commercial developments and convey it to the arterial network or to local traffic

generators such as schools and community centers. Direct lot access is limited. [See Roads Figure #10 and Roads Figure #11, Pgs 32, 33]

#### **11.4 Urban and Rural Local**

The local roadway classification is designed to provide direct lot access to abutting properties as well as on-street parking. Through traffic is discouraged. [See Roads Figure #12 and Roads Figure #13 , Pgs 34, 35]

These roadway classifications have been applied to the existing Pahrump roadway network as illustrated in the figure Street Classification Map. [See Roads Figure, Pg 36] The Map intentionally does not distinguish between urban and rural since the classifications are focused on street vehicle capacity. As illustrated, a comprehensive arterial network has been developed that includes major arterials parallel to State Roads 160 and 372. While SR 160 and 372 will continue to function as the primary north/south and east/west mobility corridors respectively for Pahrump, the availability of parallel major arterial routes such as Blagg Road and Basin Avenue will provide motorists with efficient alternate routes during periods of high congestion.

## **12.0 FUNCTIONAL CLASSIFICATION STANDARDS**

Typical roadway cross-section details have been developed for each of the four independent Pahrump roadway classifications and are illustrated in figures. See Roads Figure #7 thru #10. The figures are entitled Typical Section – Major Arterial, Minor Arterial, Collector, and Local. In addition to these figures, basic design criteria have been established for each of the four roadway classifications, as outlined in Roads Figure #15 – GEOMETRIC DESIGN STANDARDS CHART. This chart highlights the classification standards are described below.

#### **12.1 Major Arterial**

These roadways are designed to provide two through lanes in each direction as well as a 12-foot striped or curbed median/center left-turn lane. The required right-of-way is 90 feet with no additional easements and no open ditch. If an open ditch is included it is recommended that the width be increased to 120 feet. Average Daily Traffic (ADT) is limited to 40,000. Intersections must be spaced a minimum of ½ mile apart.

#### **12.2 Urban and Rural Minor Arterial**

These roadways are designed to provide one through lane in each direction as well as a 12-foot striped or curbed median/left-turn lane. Bike lanes are designated on both sides of the roadway where practical. The required right-of-way is 70 feet including 5-foot easement on both sides to provide for utilities and/or equestrian trails and no open

ditch. If an open ditch is included it is recommended that the width be increased to 100 feet. ADT is limited to 20,000. Intersections must be spaced a minimum of ¼ mile apart.

### **12.3 Urban and Rural Collector**

These roadways are designed to provide one through lane in each direction as well as bike lines on one or both sides of the roadway. The required right-of-way is 60 feet with no additional easements, where feasible. ADT is limited to 10,000. Intersections must be spaced a minimum of 660 feet apart.

### **12.4 Urban and Rural Local**

These roadways are designed to provide one through lane in each direction with parking allowed on both sides of the roadway. The required right-of-way is 50 feet with an additional 5-foot utility easement required on both sides. There would be an 8' public utility easement outside of the right-of-way. ADT is limited to 3,000. Intersections must be spaced a minimum of 300 feet apart.

## **13.0 CAPACITY ANALYSIS**

A roadway capacity evaluation is based upon the Highway Capacity Manual concept of Level of Service (LOS) which is defined as a qualitative measurement of speed and travel time, freedom to maneuver, traffic interruptions, comfort, convenience and safety. One type of analysis used to determine operational Levels of Service for roadway segments is the volume to capacity ratio (v/c). The following v/c thresholds apply:

LOS "A" – free flow conditions, maximum v/c 0.60

LOS "B" – stable flow conditions, maximum v/c 0.70

LOS "C" – stable flow conditions, maximum v/c 0.80

LOS "D" – approaching unstable flow, maximum v/c 0.90

LOS "E" – unstable flow, capacity threshold 1.0

Levels of Service A through D are generally considered acceptable and represent a reasonable movement of vehicles. In order to determine the performance of the existing Pahrump roadway network a capacity evaluation was performed for the same roadway segments on which 24-hour count data was collected. All of the roadway segments were found to be operating at Level of Service "B" or better. Pahrump Valley Boulevard south of State Road 372 was found to have the highest v/c ratio, 0.62, which is still well within acceptable levels. Implementation of the proposed Major Arterial network outlined on the Street Classification Map will be required in order to provide

adequate capacity for projected Year 2025 average daily traffic volumes on the following corridors:

Pahrump Valley Boulevard  
Homestead Road  
Calvada Boulevard  
Basin Avenue

When designed to the Major Arterial standard, these roadways are expected to operate at Level of Service "A" through the Year 2025.

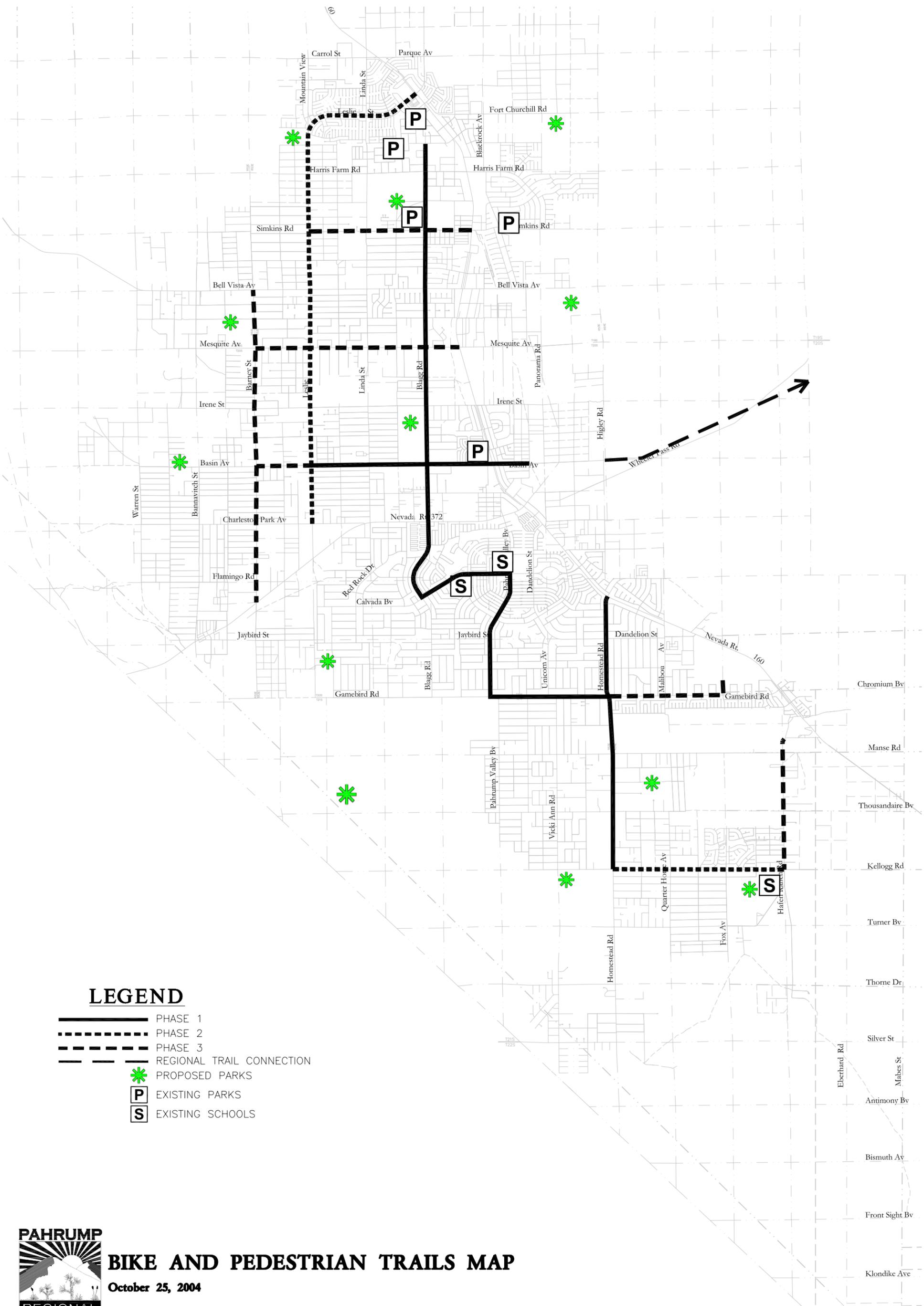
## **14.0 IMPLEMENTATION AND MONITORING PLAN**

The establishment and maintenance of a comprehensive traffic volume count program is critical in determining the need for roadway improvements. 24-hour traffic counts should be conducted every two years on major and minor arterials and every four years on collectors. Although v/c ratios within the Level of Service "D" category are considered acceptable, it is advisable to consider upgrading roadway segments to their respective classification as indicated on the Street Classification Map once they begin to fall into the category of LOS "C".

Other considerations in project identification to upgrade roadway segments include historic and future traffic issues, transportation significance, rights-of-way acquisition needs, AASHTO functional relationship, Pavement Condition Index (PCI) and finally their coordination with other upgrade projects.

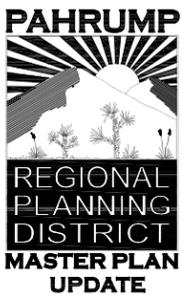
In addition to traffic counts and various considerations above, traffic turning movement counts may need to be conducted in order to determine the need for intersection operational improvements including auxiliary turn lane requirements. The turning movement counts will also provide the requisite information for traffic signal warrant studies. Proposed roadway improvements should be undertaken with the ultimate goal of establishing the proposed roadway network outlined in the Street Classification Map. Priority should be given in accordance with the hierarchical roadway classifications, with Major Arterials given the highest priority.

In conjunction with the approval of this plan a Capital Improvements Plan (CIP) will be prepared in coordination with the Public Works Department. CIPs outline the County's plan for improvements, the cost of improvements and scheduled timing of improvements. The information from the CIP can also be used to develop an Impact Fee that imposes proportional impacts of new traffic caused by new construction.



**LEGEND**

-  PHASE 1
-  PHASE 2
-  PHASE 3
-  REGIONAL TRAIL CONNECTION
-  PROPOSED PARKS
-  EXISTING PARKS
-  EXISTING SCHOOLS



**BIKE AND PEDESTRIAN TRAILS MAP**

October 25, 2004

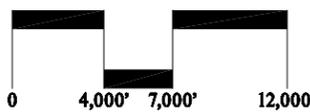
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NORTH



**ADEQUATE PUBLIC FACILITIES PLAN AND POLICY  
 NYE COUNTY, NEVADA**

**EXISTING TRIP GENERATION CHART**

October, 2004

Land Use	ITE Code	Quantity	Units	Trip Generation Rates			Trips Generated						
				Weekday	AM Peak-Hour In	Out	PM Peak-Hour In	Out	Weekday	AM Peak-Hour In	Out	PM Peak-Hour In	Out
General Heavy Industrial	120	1144	ksf	1.5	0.255	0.255	0.34	0.34	1716	292	292	389	389
	210	10920	houses	9.57	0.1875	0.5625	0.6464	0.3636	104504.4	2048	6143	7059	3971
Apartment	220	360	apts	6.63	0.0816	0.4284	0.4154	0.2046	2386.8	29	154	150	74
Mobile Home Park	240	720	homes	4.81	0.084	0.316	0.3472	0.2128	3463.2	60	228	250	153
Golf Course	430	110	acres	5.04	0.1554	0.0546	0.102	0.198	554.4	17	6	11	22
Hospital	610	5	ksf	16.78	0.7081	0.2619	0.2208	0.6992	83.9	4	1	1	3
General Office Building	710	100	ksf	11.01	1.3728	0.1872	0.2533	1.2367	1101	137	19	25	124
Business Park	770	0	ksf	12.76	1.2012	0.2288	0.2967	0.9933	0	0	0	0	0
Shopping Center	820	1500	ksf	42.92	0.6283	0.4017	1.7952	1.9448	64380	942	603	2693	2917
<b>TOTAL</b>									<b>178190</b>	<b>3529</b>	<b>7445</b>	<b>10578</b>	<b>7652</b>

Source: ITE Trip Generation, 6th Edition 1997. Fitted curve equations utilized where available. Ksf: 1,000 square feet

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**ADEQUATE PUBLIC FACILITIES PLAN AND POLICY**

Nye County, Nevada

**Roads Figure 2**

**FUTURE TRIP GENERATION - YEAR 2025**

October, 2004

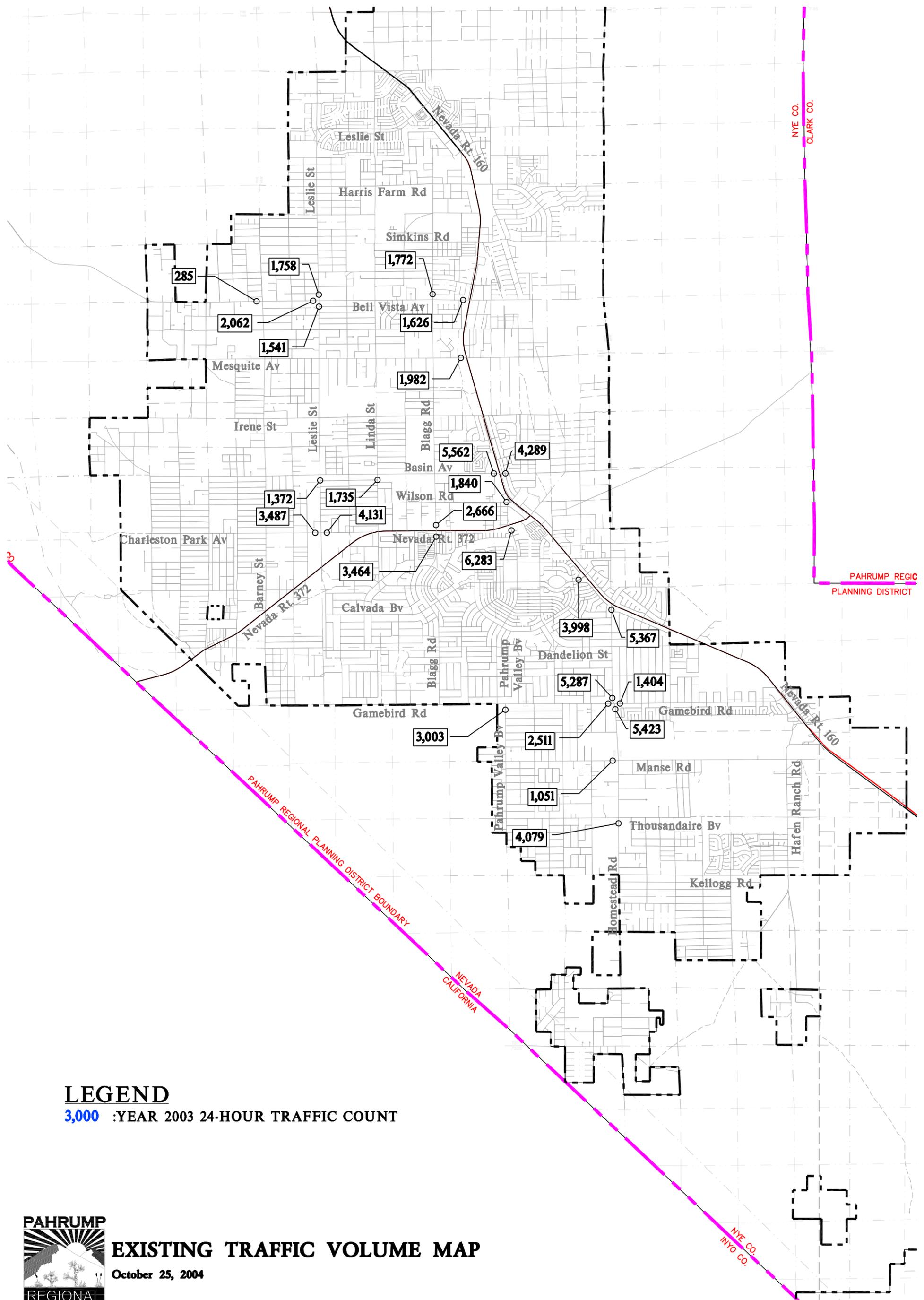
Land Use	ITE Code	Quantity	Units	Trip Generation Rates				Trips Generated					
				Weekday	AM Peak-Hour	PM Peak-Hour	Out	In	Out	In	Out	In	
General Heavy Industrial	120	5700	ksf	1.5	0.255	0.255	0.34	0.34	8550	1454	1454	1938	1938
Single-Family Detached Housing	210	23800	houses	9.57	0.1875	0.5625	0.6464	0.3636	227766	4463	13388	15384	8654
Apartment	220	2100	apts	6.63	0.0816	0.4284	0.4154	0.2046	13923	171	900	872	430
Mobile Home Park	240	725	homes	4.81	0.084	0.316	0.3472	0.2128	3487.25	61	229	252	154
Golf Course	430	100	acres	5.04	0.1554	0.0546	0.102	0.198	504	16	5	10	20
Hospital	610	50	ksf	16.78	0.7081	0.2619	0.2208	0.6992	839	35	13	11	35
General Office Building	710	14500	ksf	11.01	1.3728	0.1872	0.2533	1.2367	159645	19906	2714	3673	17932
Business Park	770	8000	ksf	12.76	1.2012	0.2288	0.2967	0.9933	102080	9610	1830	2374	7946
Shopping Center	820	4500	ksf	42.92	0.6283	0.4017	1.7952	1.9448	193140	2827	1808	8078	8752
<b>TOTAL</b>				<b>63,900</b>	<b>population</b>				<b>709934</b>	<b>38542</b>	<b>22341</b>	<b>32592</b>	<b>45861</b>

Source: ITE Trip Generation, 6th Edition 1997. Fitted curve equations utilized where available. Ksf: 1,000 square feet

**Roads Figure 3**

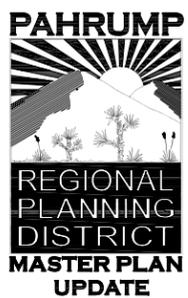
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**ADEQUATE PUBLIC FACILITIES PLAN AND POLICY**  
Nye County, Nevada



**LEGEND**

**3,000** :YEAR 2003 24-HOUR TRAFFIC COUNT



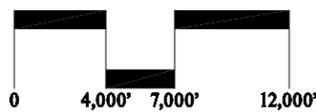
**EXISTING TRAFFIC VOLUME MAP**

October 25, 2004

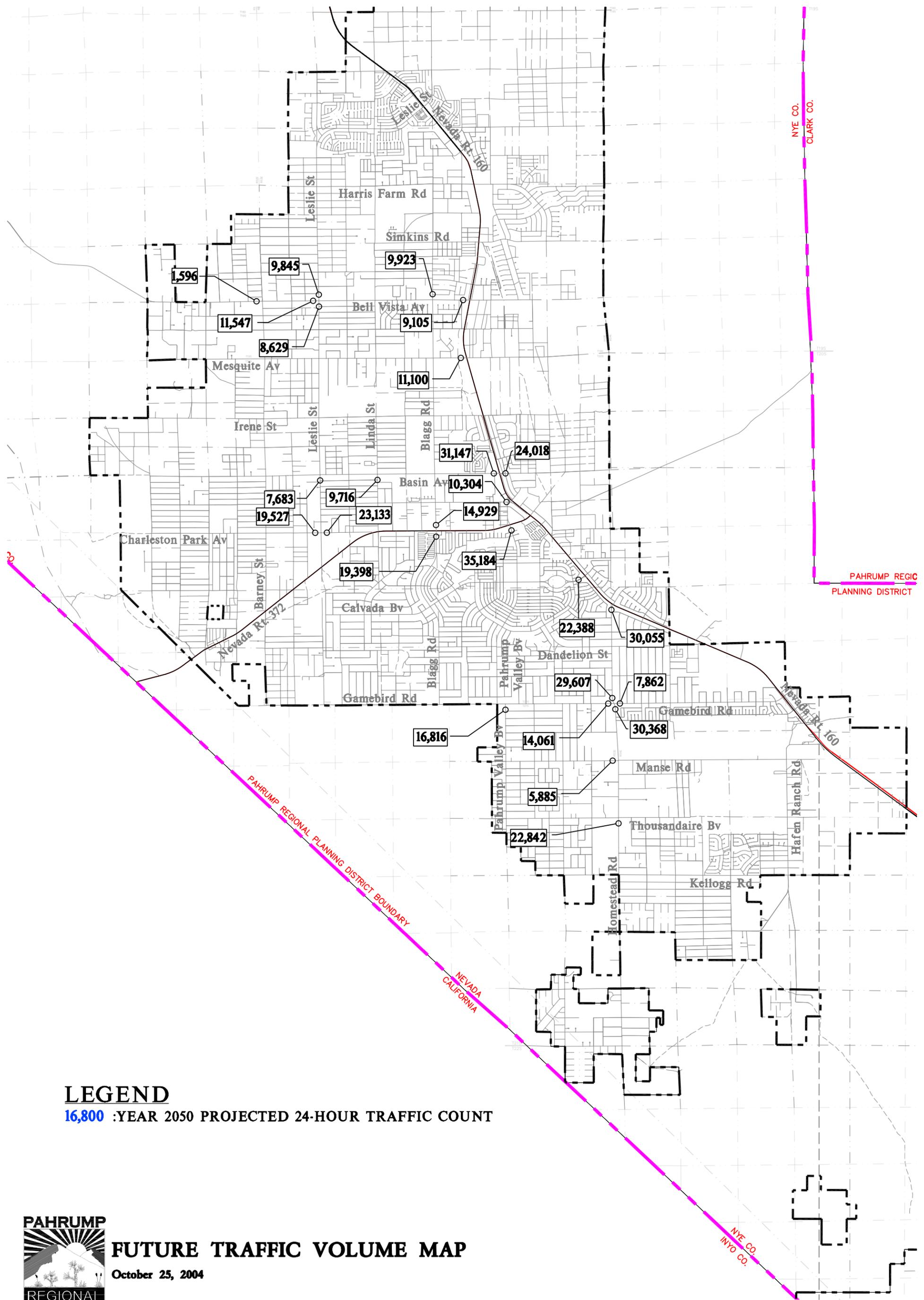
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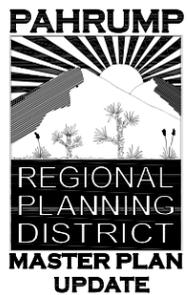


**ADEQUATE PUBLIC FACILITIES PLAN AND POLICY**  
**NYE COUNTY, NEVADA**



**LEGEND**

16,800 :YEAR 2050 PROJECTED 24-HOUR TRAFFIC COUNT



**FUTURE TRAFFIC VOLUME MAP**

October 25, 2004

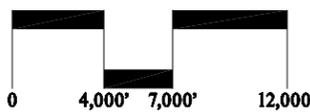
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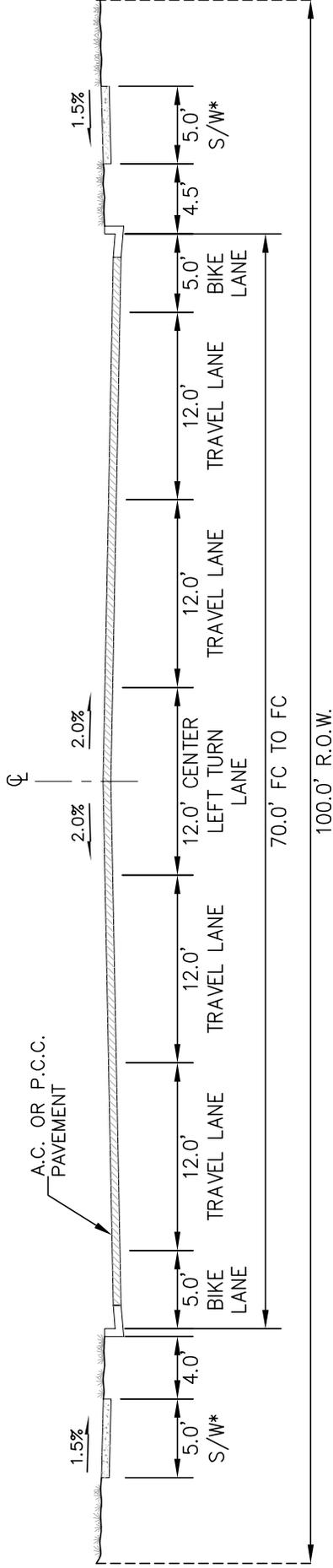
NORTH



**ADEQUATE PUBLIC FACILITIES PLAN AND POLICY**  
 NYE COUNTY, NEVADA



# MAJOR ARTERIAL



**40,000 ADT MAXIMUM**  
**50 MPH DESIGN SPEED**  
**45 MPH POSTED SPEED**

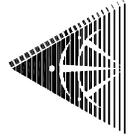
**1/2 MILE INTERSECTION SPACING**  
**\*OPTIONAL TO ELIMINATE THE SIDEWALK ON ONE SIDE AND CREATE A 12' WIDE SHARED-USE TRAIL**

## TYPICAL SECTION - MAJOR ARTERIAL



March 15, 2005

PREPARED BY:

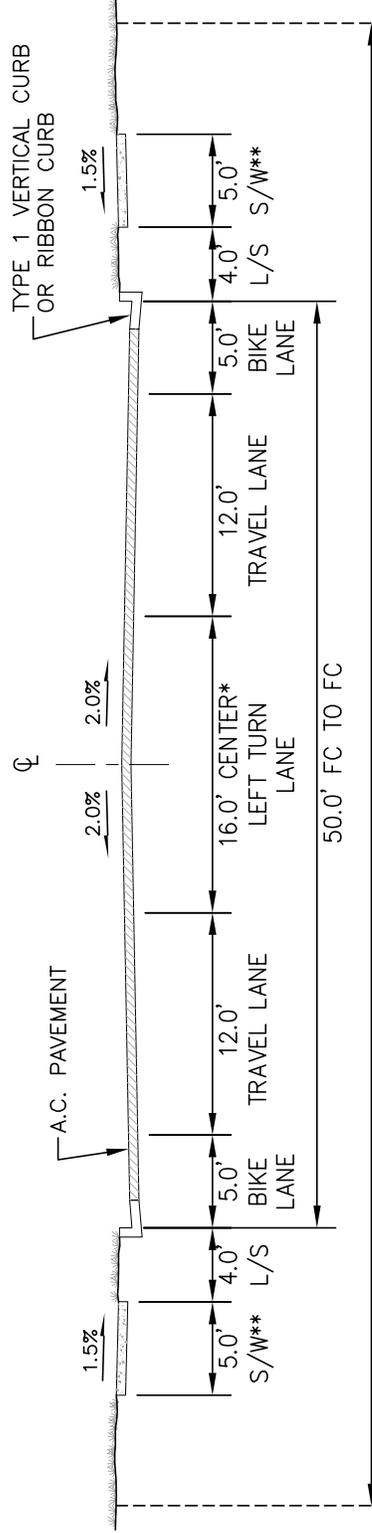


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## PAHRUMP REGIONAL PLANNING DISTRICT MASTER PLAN UPDATE

NYE COUNTY, NEVADA

# URBAN MINOR ARTERIAL



80.0' R.O.W.

20,000 ADT MAXIMUM  
 50 MPH DESIGN SPEED  
 45 MPH POSTED SPEED

1/4 MILE INTERSECTION SPACING

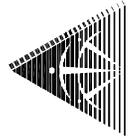
\*OPTIONAL 10' CENTER LANE AND 8' PARKING ON BOTH SIDES  
 \*\*OPTIONAL TO ELIMINATE THE SIDEWALK ON ONE SIDE AND  
 CREATE A 12' WIDE SHARED-USE TRAIL

## TYPICAL SECTION - MINOR ARTERIAL



March 15, 2005

PREPARED BY:

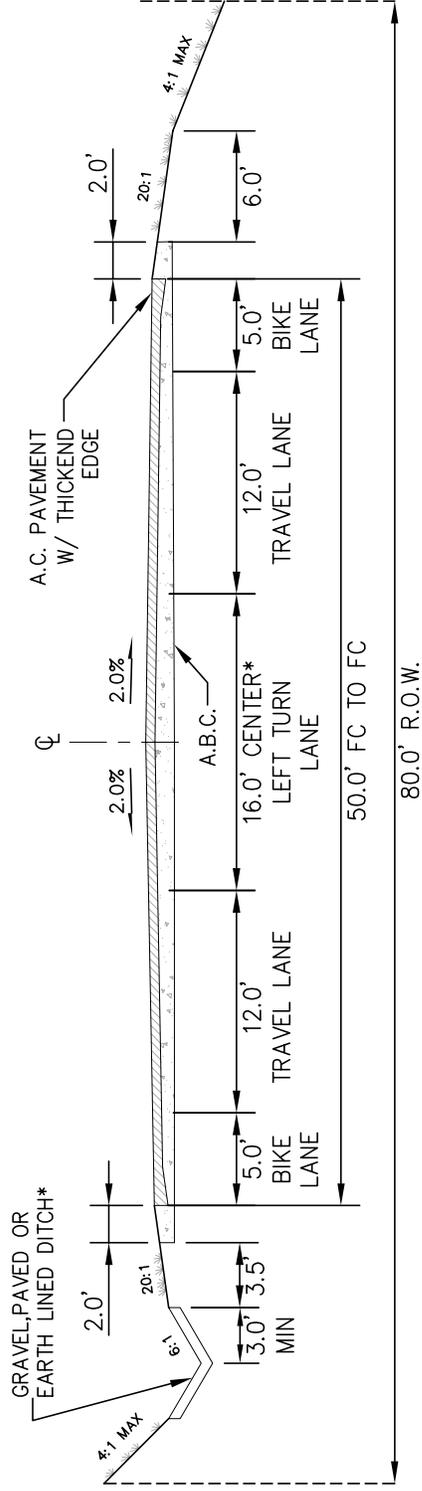


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## PAHRUMP REGIONAL PLANNING DISTRICT MASTER PLAN UPDATE

NYE COUNTY, NEVADA

# RURAL MINOR ARTERIAL



20,000 ADT MAXIMUM  
 50 MPH DESIGN SPEED  
 45 MPH POSTED SPEED

OPTIONAL TO ELIMINATE THE SIDE DITCH ON ONE SIDE AND  
 CREATE A 12' WIDE SHARED-USE TRAIL WITH  
 1/4 MILE INTERSECTION SPACING

## TYPICAL SECTION - MINOR ARTERIAL



March 15, 2005

PREPARED BY:

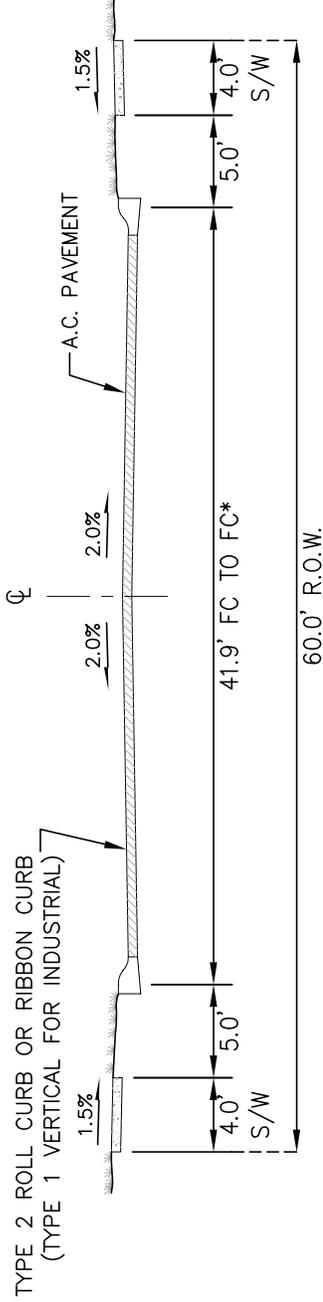


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## PAHRUMP REGIONAL PLANNING DISTRICT MASTER PLAN UPDATE

NYE COUNTY, NEVADA

# URBAN COLLECTOR STREET



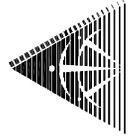
**10,000 ADT MAXIMUM**  
**40 MPH DESIGN SPEED**  
**35 MPH POSTED SPEED**  
**660' INTERSECTION SPACING**  
 \* OPTIONAL PARKING BOTH SIDES OR 10'  
**CENTER LANE AND BIKE LANE ON BOTH SIDES**

## TYPICAL SECTION · URBAN COLLECTOR



March 15, 2005

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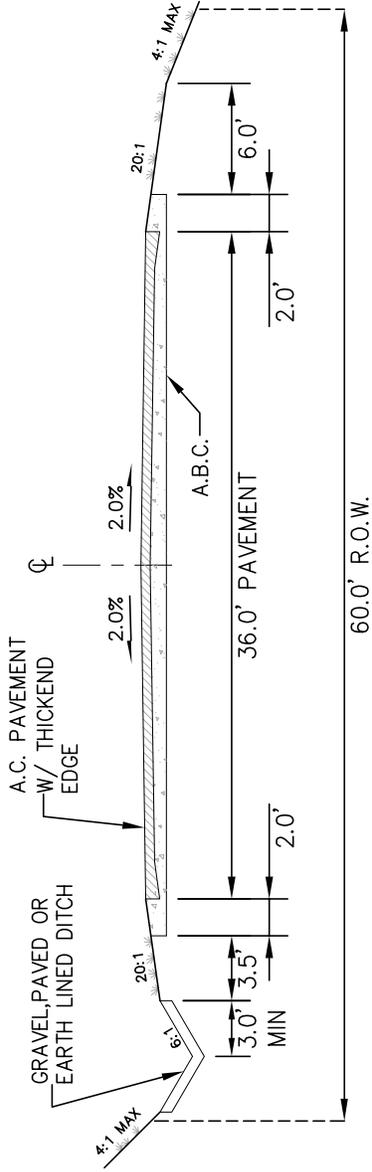


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## PAHRUMP REGIONAL PLANNING DISTRICT MASTER PLAN UPDATE

NYE COUNTY, NEVADA

# RURAL COLLECTOR STREET



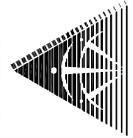
10,000 ADT MAXIMUM  
 40 MPH DESIGN SPEED  
 35 MPH POSTED SPEED  
 660' INTERSECTION SPACING

## TYPICAL SECTION - RURAL COLLECTOR



March 15, 2005

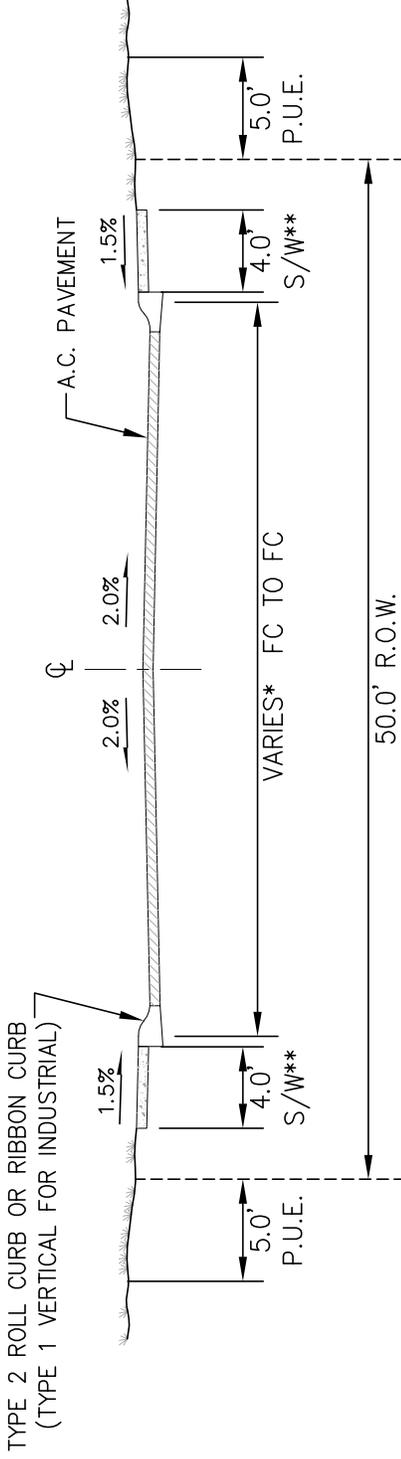
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## PAHRUMP REGIONAL PLANNING DISTRICT MASTER PLAN UPDATE

NYE COUNTY, NEVADA



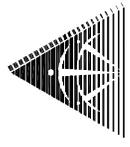
**3,000 ADT MAXIMUM**  
**30 MPH DESIGN SPEED**  
**25 MPH POSTED SPEED**  
**330' INTERSECTION SPACING**  
**DIRECT LOT ACCESS PERMITTED**  
**\*40'-(PARKING BOTH SIDES) INDUSTRIAL LAND USE**  
**\*36'-(PARKING BOTH SIDES) MULTI-FAMILY DENSITY**  
**\*32'-(PARKING BOTH SIDES) SINGLE FAMILY DENSITY**  
**\*26'-(NO PARKING ON STREET) COMMON GUEST PARKING PROVIDED ELSEWHERE**  
**\*\* OPTIONAL DETACHED SIDEWALK AT 32' FC TO FC OR LESS**

**TYPICAL SECTION · URBAN LOCAL**



March 15, 2005

PREPARED BY:

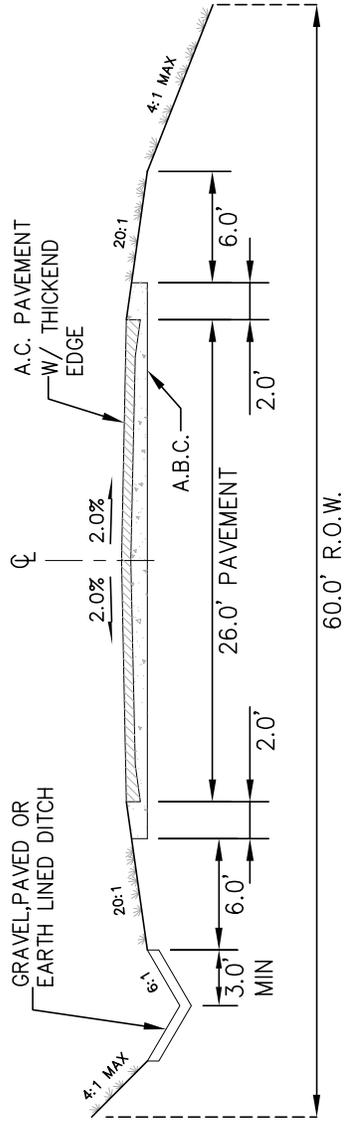


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**PAHRUMP REGIONAL PLANNING DISTRICT**  
**MASTER PLAN UPDATE**

**NYE COUNTY, NEVADA**

# RURAL LOCAL STREET



**3,000 ADT MAXIMUM**  
**35 MPH DESIGN SPEED**  
**30 MPH POSTED SPEED**  
**660' INTERSECTION SPACING**  
**DIRECT LOT ACCESS PERMITTED**

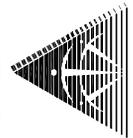
60.0' R.O.W.

## TYPICAL SECTION - RURAL LOCAL



March 15, 2005

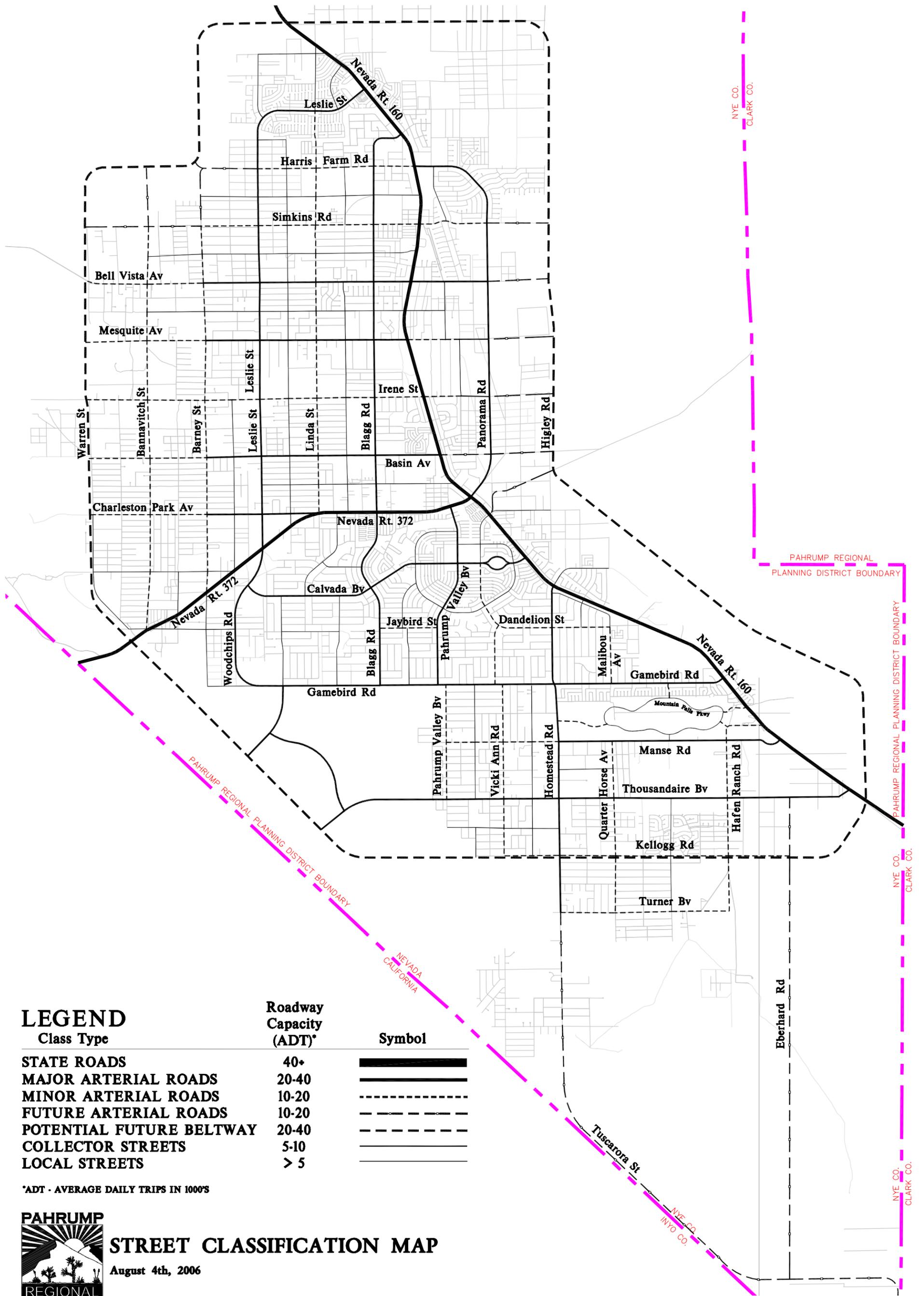
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## PAHRUMP REGIONAL PLANNING DISTRICT MASTER PLAN UPDATE

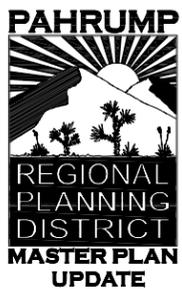
NYE COUNTY, NEVADA



**LEGEND**  
Class Type

Class Type	Roadway Capacity (ADT)*	Symbol
STATE ROADS	40+	
MAJOR ARTERIAL ROADS	20-40	
MINOR ARTERIAL ROADS	10-20	
FUTURE ARTERIAL ROADS	10-20	
POTENTIAL FUTURE BELTWAY	20-40	
COLLECTOR STREETS	5-10	
LOCAL STREETS	> 5	

\*ADT - AVERAGE DAILY TRIPS IN 1000'S



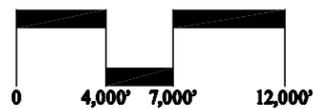
**STREET CLASSIFICATION MAP**

August 4th, 2006

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**TRI-CORE ENGINEERING**



**ADEQUATE PUBLIC FACILITIES PLAN AND POLICY**  
NYE COUNTY, NEVADA

## Geometric Design Standards for Roadway Construction

Roadway Classification	Design Capacity ADT	Surface Required	Number of Lanes	Design Vehicle	R.O.W. Width	Access Control	Parking	Curb & Gutter Type
Major Arterial	Over 20,000	P.C.C. or Bituminous	4	WB - 50	100	See Section	Prohibited	6" Vertical
Urban Minor Arterial	10,000 - 20,000	Bituminous	2 - 4	WB - 40	80	See Section	Prohibited	6" Vertical
Rural Minor Arterial	10,000 - 20,000	Bituminous	2 - 4	WB - 40	80	See Section	Prohibited	6" Vertical
Urban Collector	2,000 - 10,000	Bituminous	2	WB - 41	60	See Section	Optional-both Sides	6" Roll/Ribbon
Rural Collector	2,000 - 10,000	Bituminous	2	WB - 41	60	See Section	Prohibited	None
Urban Local	Less Than 3,000	Bituminous	2	SU	50	See Section	Allow-both Sides	6" Roll/Ribbon
Rural Local	Less Than 3,000	Bituminous	2	SU	60	See Section	Prohibited	None

Roadway Classification	Sidewalk Width	Bike Lane Width	Width FC to FC	Median Width	Design Speed	Posted Speed	% Grade	
							Min.	Max.
Major Arterial	5 Feet	5 Feet	70 Feet	12 Feet	50 Mph	45 Mph	0.5	6.0
Urban Minor Arterial	5 Feet	5 Feet	50 Feet	16 Feet	50 Mph	45 Mph	0.5	6.0
Rural Minor Arterial	None	5 Feet	50 Feet	16 Feet	50 Mph	45 Mph	0.5	6.0
Urban Collector	5 Feet	Optional 5 feet	42 Feet	None	40 Mph	35 Mph	0.5	8.0
Rural Collector	None	None	36 Feet	None	40 Mph	35 Mph	0.5	8.0
Urban Local	4 Feet	None	26 to 40 FT	None	30 Mph	25Mph	0.5	8.0
Rural Local	None	None	26 Feet	None	35 Mph	30 Mph	0.5	8.0

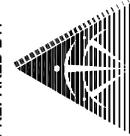
\*See Street Cross Section

## DESIGN STANDARDS



March 15, 2005

PREPARED BY:



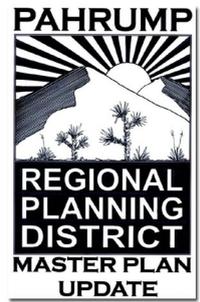
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# PAHRUMP REGIONAL PLANNING DISTRICT MASTER PLAN UPDATE

NYE COUNTY, NEVADA

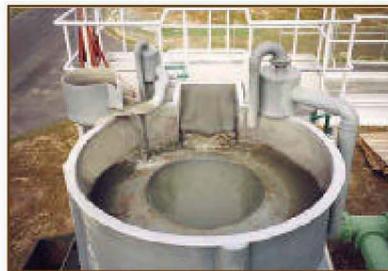
# Pahrump

## Regional Planning District



# Sewer System Plan

August 7th, 2006  
5th DRAFT



**“Heart of the New Old West”**

# **Sanitary Sewer System Plan**

## **FINAL REPORT**

**5<sup>th</sup> Draft**  
August 7<sup>th</sup>, 2006

Prepared For:  
**Nye County, Nevada**

Prepared By:  
**Tri-Core Engineering**  
**8840 E. Chaparral Road**  
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**(480) 346-3200**

**SANITARY SEWER SYSTEM PLAN  
Pahrump Regional Planning District  
Nye County, Nevada**

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## **SANITARY SEWER SYSTEM PLAN**

### **1.0 INTRODUCTION**

This section of the Adequate Public Facilities Plan contains the Sanitary Sewage System Plan for the Pahrump Regional Planning District. The Town of Pahrump comprises approximately 90 square miles and has a current residential population close to 32,000 people. The population within the Pahrump Regional Planning District is projected to ultimately be nearly 150,000 people. This population will most likely never be completely served by the master sewer infrastructure, but the existing independent systems are not progressing in an orderly fashion to facilitate growth projected in the near term. The accelerated growth in the valley will apply stress on the existing sewage systems, expansions and the timing of same. This population projection is conservative but will prevent costly replacement and/or paralleling of undersized trunk lines.

In order to serve new development in Pahrump, expansion, modifications and integration of new and existing sewer facilities will be required. In addition, it is advantageous to consolidate the operation of the sanitary sewage system into a single regional sanitary sewage system to ensure continuity in system design, operation, and for providing quality assurance, controlled use, environmental protection, and funding purposes; and service to the entire town. The Sanitary Sewage System Plan is intended to provide Nye County with a guide for utilizing existing treatment facilities, development of new treatment facilities, and will ultimately reduce the number of individual septic systems that may be constructed in Pahrump. This plan will be flexible enough to absorb some changes in planning and development patterns. Periodic review with updates showing the relationship of construction of facilities to future planning is required. Without proper planning and management of the Sanitary Sewage System, contamination of groundwater and the environment is a distinct possibility and needs to be addressed.

### **2.0 EXISTING SANITARY SEWER SYSTEMS**

Currently there is no sewage system plan for the Planning District. Existing subdivisions either construct/operate their own system or the subdivision consists of large lots capable of supporting an individual septic system. The Plan area currently has four existing utility service areas serving existing/future developments. The four service areas are:

- Desert Utilities Inc. (Desert Trails)
- Pahrump Utility Company (Hafen Ranch)
- Mountain Falls Subdivision Area (Mountain Falls)

- Public Utilities Inc. (Calvada)

Each having their respective service areas and existing utility infrastructure that provide sewer service. [See Sewer Figure #1, Pg 55] Each service area has associated sewer collection and treatment facilities. Treatment facilities range from individual septic systems to sewage treatment plants using the treated effluent for irrigation of a golf course. [See Sewer Figure #2, Pg 56]

The Nye County Water Resources Plan estimates that as many as 20,000 additional individual septic systems might be installed in the Planning District in the next 50 years. The potential for groundwater contamination is greatly increased as the number of individual septic systems multiplies. Groundwater is the sole source of potable water for the Planning District and contamination of that source is detrimental to the preservation of the environment, resident lifestyles, and economic well being of all residents.

### **3.0 SANITARY SEWER GOALS, OBJECTIVES, PURPOSES, POLICIES AND IMPLEMENTATION**

**GOAL #1:** Provide adequate collection and treatment services generated from all residential, industrial, commercial and institutional wastewater discharge in the community and to protect the health and environment of the community, and quality of surface and groundwater.

**Objective-A:** Determine and prioritize when and where sanitary sewer services are needed to accommodate existing and proposed developments.

**Objective-B:** Identify sites for a future regional sewage treatment facility.

**Objective-C:** Explore alternative collection systems to provide cost effective service to 1-acre or larger lots located in the Low Density Land Use Designation.

**Objective-D:** Examine reclaiming treatment plant effluent water for irrigation existing and future purposes.

**Objective-E:** Encourage the reduction of the number of individual septic systems

**Objective-F:** Explore alternative septic systems that output a higher quality of water to reduce the potential of contaminating surface and groundwater.

**Objective-G:** Create and utilize a variety of policies to ensure the Goal is met in a planned and sustainable manner.

**Objective-H:** Develop regulations to address problems with septic tanks in areas of hydro-collapsible and expansive soils.

**Purpose:**

The purpose of the following policies is to provide adequate sewage collection and wastewater treatment services to Pahrump, and when feasible, use effluent water for irrigation and other purposes as a means of conserving water resources.

**Policy 1:** It is the policy of Nye County to review sewer hookup fees for residential units in order to establish and maintain a fee

**Policy 2:** It is the policy of Nye County that, whenever feasible, effluent water shall be used for irrigation of parks, open space, golf courses, and landscaping in the public right-of-way or other purposes.

**Implementation Action:**

Regional Wastewater Facility Plan: Nye County shall explore the necessary steps to develop a Regional Wastewater Facility. The necessary steps are outlined below.

- Utilize GIS to develop mapping and an inventory of the existing facilities.
- Create a Public Awareness Program for groundwater contamination by individual septic systems.
- Discuss creation of a regional sanitary sewage system for Pahrump.
- Discuss creation of a Utility Extension Policy to ensure developments are required to connect to the regional sanitary sewage system.
- Explore the possibilities of creating a sewer improvement district.
- Create a Public Awareness Program to educate the public on the benefits, scope, cost and timing of a regional treatment facility.
- Explore with stakeholders and agencies and develop an appropriate funding mechanism and new utility organizational structure in connection with the development of a CIP

## 4.0 SCOPE OF COLLECTION ANALYSIS

The elements of a central sewer collection and treatment system are the sewer services, laterals, trunk lines, manholes, lift stations, force mains, treatment facilities, effluent water lines and all correlated appurtenances associated with the collection, transportation, and treatment of wastewater. This comprehensive system plan is mainly concerned with trunk system improvements which include all lines 10 inches in diameter and larger, essential sewer treatment facilities, and other facilities (such as lift stations) which are a vital part of the sewage system. Since lateral or local sewer typically are generally routed along residential streets within a development, it is impractical to try to predict the future location of the streets and therefore is excluded from this plan

A large segment of the western portion of the study area is comprised of large lot residential subdivisions (1-acre lots). These lots are large enough to support domestic wells and individual septic systems. It is estimated that 20,000 or more individual septic systems could be constructed in this area in the future. As stated above, this presents a serious impact on the quality of the ground and surface water and needs to be addressed. This study will discuss alternate sewer collection and treatment systems to serve this area. All maps in this Plan are conceptual in nature and are subject to a detailed selection process in the preliminary and final design of the trunk system

An outline of the steps involved in preparing the potential plan is presented below:

- Determine collection district boundaries for trunk sewers.
- Relate probable land usage (from Land Use Plan) to design flows of wastewater anticipated from the study area.
- Establish generally the sewer trunk routing and sizes.
- Review and analyze existing sewer collection systems and treatment facilities.
- Integrate existing and proposed facilities into development of trunk facilities.
- Investigate alternatives to serve large areas of low-density residential development in the western portions of the study area.
- Identify alternative methods of reclaiming treatment plant effluent water discharges.
- Develop a final Regional Sewage Treatment Facility Plan.
- Prepare Mapping and ARC/INFO overlays

#### 4.1 SANITARY SEWER DISTRICTS

We have identified six major sanitary sewer districts in the planning area, each defining the limits of service for a separate proposed trunk system. These districts were further subdivided into smaller sub-districts that were used to develop design flows and to determine cumulative design flows in the various sewer segments. The major sanitary sewer districts and their corresponding prefix abbreviations are given below in Table 1.

**Table 1 - Sanitary Sewer Surface Drainage Districts**

Sewer District	Abbreviation
Calvada District	CD
Desert Utilities District	DD
East District	ED
North District	ND
South District	SD
West District	WD

The boundaries of all the minor districts are inclusive of all area to be serviced within the planning area. [See Sewer Figure #3, Pg 57] Development of a new regional treatment facility will require phasing and it may be determined at that time the phasing out of some old facilities may be required to reduce the operating costs and chances of water pollution.

#### 5.0 ANALYSIS LAND USE AND POPULATION

The sizing of sanitary sewage facilities is dependent on the hydraulic capacity for each part of the system. Municipal wastewater generally is a mixture of domestic sewage, commercial and industrial wastes, groundwater inflow/infiltration, and surface water inflow. Proper design and construction of sewer systems will reduce groundwater infiltration to a minor percentage of the total flow and surface water inflow will be eliminated. Hydraulic discharges, which must be handled, depend to the greatest extent upon the type of development (land use) and the population densities, which are ultimately achieved.

## 5.1 Land Use

The Land Use Master Plan served as a basis for development of the sanitary sewer trunk system. Table 2, below presents a description of the future land uses utilized to estimate the volume of sewage flow. The wildlife habitat reserve and parks/open space land uses have not been designated to generate sewage flow and have therefore been eliminated from the hydraulic calculations in this Plan. The Plan is designed to be a living document and subject to modifications, but the sewage system plan has limited flexibility to accommodate changes once it has been constructed, especially trunk lines.

**Table 2 - Land Use Type Descriptions**

1)	Rural Residential – Single family lots with five-acre minimum lot size. This land used is not included in sewage collection calculations and is considered to be served by individual septic systems.
2)	Low Density Residential – Single family residential on lots with one-acre minimum lot size. Sewage calculations based on 1 dwelling unit (DU) per acre.
3)	Medium Density Residential – Single or multifamily residential on lots less than one acre, but greater than 8000 square feet. Sewage calculations based on 3.0 dwelling units (DU) per acre.
4)	Multi-Family Residential – This area is characterized by high-density residential uses. Sewage calculations based on 8.0 dwelling units (DU) per acre.
5)	Mixed Use – A mix of commercial/office/residential uses are allowed to provide a more dense, urban core, with pedestrian amenities, trails, sidewalks and places for residents to live, work, and play. Commercial uses are at neighborhood scale, prohibiting “big box” buildings greater than 80,000 square feet. Residential development of single or multi-family housing is allowed.
6)	General Commercial – Activities involving the sale of goods and services, including liquor sales, automobile sales and repair, movie theaters, large-scale retailers, hotels, restaurants, gas stations, malls, sexually orientated businesses, big box retail and casinos.
7)	RV Parks/Commercial – This area is characterized by RV lots as commercial uses.

8)	Business Parks – Area dedicated to business development, serving companies with compatible and complementary services. These will be planned developments, with landscaped, attractive areas, that can accommodate neighborhood-scale commercial uses, including restaurants and small-scale retail, such as bakeries or copy shops in addition to light industrial uses.
9)	Heavy Industrial – Industrial uses including manufacturing, constructions, production, wholesale trade, storage yards and transportation.
10)	Institutional – Institutional includes civic buildings, public utility facilities, schools, and emergency facilities.

The land use map represents ultimate build-out with a population estimated at 150,350 people. The projected population in the year 2025 is over 63,000 people, which are approximately 42% of the ultimate population. Pahrump historically has experienced development in an unpredictable, random pattern throughout the master planning area. For this reason, it is assumed that the development of vacant land within the land use designations will be at 40%, with the exception of 1000-acre Mountain Falls, the 1100-acre America West parcel, and the 900-acre Hafen subdivisions. These areas have and will experience significant growth over the next 30 years. Build-out for these areas are estimated to be 100%. Table 3, below presents a gross area of the future land uses utilized to estimate the volume of sewage flow.

**Table 3 - Summary of Land Uses by Gross Area**

Use	Gross Acres
Rural Residential (5-acre lots)	18,500
Low Density Residential	34,820
Medium Density Residential	20,970
Multi-Family Residential	119
Commercial/Mixed Use	13,085
General Commercial	4,106
Commercial (Brothel)	345
RV Parks/Commercial	172

Business Parks	4,300
Heavy Industrial	2,190
Parks	1,265
Wildlife Reserve	4,850
Municipal	700

## 5.2 Population

Predicting the future population of Pahrump is difficult based on historic growth rates. Nye County's population in 1990 was 7,424 and topped out at 30,000 in 1998. Between 1990 and 2001, Nye County experienced an 89% growth rate. Growth rates of this intensity cannot be expected to be sustained throughout the next thirty years. Sanitary sewer trunk line sizing based on low population projections will result in undersized trunk lines which will need to be paralleled. For planning the sanitary sewage system, a growth rate with a base population of 32,000 has been assumed for a total sewered population of approximately 65,000 people (approx. 40% build-out of land use) in the year 2025. This population projection is conservative but will prevent costly replacement and/or paralleling of undersized trunk lines, however the trunk system should be reviewed against real growth data as it is being developed.

## 6.0 ANALYSIS DESIGN CRITERIA

Criteria employed to create the plan design are explained in depth in the subsequent section, but in general the Recommended Standards for Wastewater Facilities, 1997 edition, known as the "10 State Standards" with general engineering principals were used to establish the design perimeters needed to create the plan. The following sections cover wastewater generation rates, Inflow/Infiltration and surface water inflow, peaking factors, pipe capacities, and finally sewage velocities.

### 6.1 Wastewater Generation Rates

Anticipated wastewater flows from the various sub-districts were determined by applying unit flow rates to each of the land use categories. The Wastewater flow rates and peaking factor methods are presented in Table 4 on the following page.

Table 4 incorporates 2.4 capita per DU (US Census Data in 2000 for Nye County) and a 240 gal/capita/day sewage generation rate for all residential land uses per NAC

445A.284. The estimated flows are in accordance with standard engineering practice, include flow from inflow/infiltration, and are generally considered conservative.

**Table 4 - Area Wastewater Flow Rates**

	LAND USE	ULTIMATE FLOW GENERATION RATE (Gallons/Acre/Day)	PEAKING FACTOR
RR	Rural Residential (5-acre Min.)	N/A-Septic System	N/A
LD	Low Density Residential (1 DU per acre)	240	Ten State
MD	Med. Density Residential (3.0 DU's per acre)	720	Ten State
MF	Multi-Family Residential (8 DU's per acre)	1920	Ten State
Com	Commercial	1750	Constant
RV	RV Parks/Commercial	1750	Constant
MU	Commercial/Office/Residential	1500	Constant
LI	Business Park/Light Industrial	1500	Constant
HI	Heavy Industrial	2000	Constant
IN	Institutional	1500	Constant

## 6.2 Inflow/Infiltration and Surface Water Inflow

The infiltration/inflow of clean groundwater into the sanitary sewage system in Pahrump is not a significant issue due to the arid climate, but should be considered in the design of trunk lines. Typical values of inflow/infiltration in new sewer systems range from 5-10 gallons/capita/day. These infiltration/inflow rates are included in the 100-gallons/capita/day-sewage generation rate used in sizing of the trunk lines. Establishing

construction standards and routine inspections during construction is necessary to ensure that new sewer construction will minimize infiltration/inflow rates.

Surface water inflow does impact the trunk system, but only during rainfall events. A significant number of existing manhole lids have a hole in the center to aid in the removal of the cover. During rainfall events, existing roads act as drainage ways conveying shallow surface water runoff to downstream areas. The manhole lids with the center lift hole then allow the clean surface water runoff to enter the sanitary sewer system. Significant reduction of the surface water inflow can be achieved by simply plugging holes on sanitary sewer manhole lids. More extensive measures to reduce surface water inflow include waterproofing manhole casting and installing self-sealing lids. Where waterproofing the manhole casting is impractical or fail; self sealing lids should be considered. These alternate measures while important are costly. Furthermore due to the Pahrump's semi-arid climate, will not significantly affect overall annual sewer flow rates.

### **6.3 Peaking Factors, Pipe Capacities, and Sewage Velocities**

Peaking factors for population based (residential) land uses incorporate a peaking factor derived from the 10-State Standards. The remaining land uses are peaked with a constant factor of 2.0, since these land use types do not experience diurnal flow patterns that residential uses generate.

Estimating sewage flow is not an exact science and actual sewage flows can vary from calculated flows. Standard engineering practice is to size a trunk sewer line based on a percentage of the pipe capacity with typical values ranging from 70 – 85% of the total pipe capacity. This Plan sized trunk lines with a value of 75% of the pipe capacity were determined assuming an effluent flow rate of 75% of pipe capacity to allow for variation in actual sewage flow and development patterns.

Trunk sewer lines in this report have been designed to provide a self-cleansing velocity of 2.0 feet per second. Calculation of the sewage velocity is based on Manning's Formula with an "n" value of 0.013.

## **7.0 COLLECTION SYSTEM DESCRIPTION**

The proposed sanitary sewage trunk lines and location of a proposed regional treatment plant [See Sewer Figure #4, Pg 58] will need to be strategically placed throughout the valley. This figure shows the major district and sub-district boundaries, existing and proposed trunk sewers, lift stations, and forcemains. (Additional detail can be found in the technical appendix including, sizes of all trunk lines, which are shown with labels for each pipe.) The proposed sewer districts shown are based on topography and the existing utility service areas/treatment plants. For instance, Calvada District is in the central part of Pahrump with the majority of the sewage flowing west to the existing

treatment plant. It is proposed that all the sewage will ultimately flow to the south to a regional treatment plant but interim solutions to handle increasing flows might include expansion of the existing plants or might include consolidation of smaller plants into a larger temporary plant. This will be discussed as part of each major district.

The proposed alignment of the trunk sanitary sewer is tentative and should be reviewed at the time of final design to ensure conformance with existing and proposed development. The alignments shown closely follow the natural drainage of the land and roadway corridors, so any major changes in alignment are not recommended without assessment of the impacts to the remainder of the trunk system

### 7.1 Existing Utility companies and Infrastructure

The Planning area currently has four existing utility service areas serving existing/future developments. The four service areas are:

- Desert Utilities Inc. (Desert Trails)
- Pahrump Utility Company (Hafen Ranch)
- Mountain Falls Subdivision Area (Mountain Falls)
- Public Utilities Inc. (Calvada)

Each service area has associated sewer collection and treatment facilities. [See Sewer Figure #1, Pg 55] for existing service areas and infrastructure. Treatment facilities range from individual septic type systems to sewage treatment plants using the treated effluent for irrigation of a golf course. Table 5 quantifies existing sewage treatment plant sizes and their ability to be expanded.

**Table 5 - Existing Treatment Plants/Capacities**

Treatment Plant/Owner	Plant Size	Comments
North Plant/Utilities Inc.	0.37 MGD	Plant is expandable with adequate land at site. Size limited to disposal of treated effluent.
Desert Utilities	0.15 MGD	Plant is expandable with adequate land at site. Size limited to disposal of treated effluent.
Calvada/Utilities Inc.	0.6 MGD	Plant is at 90% capacity. Expansion is possible but need more land (golf course). Disposal of treated effluent on golf course.

Mountain Falls	0	No treatment plant yet. Pumping minimal sewage (0.06 MGD) to Hafen Ranch. Currently studying size of plant to construct.
Artesia/Hafen Ranch	0.2 MGD	Plant is permitted and expandable to 0.6 MGD with adequate land at site. Future plant expansions will pump treated effluent to Mountain Falls golf course.

## 7.2 Reclamation of Treated Effluent

Reclamation and reuse of the treated effluent from treatment plants is a major concern in Pahrump. With limited groundwater resources, reuse of the treated effluent is vital to the preservation of groundwater. Calvada is currently using treated effluent from the Calvada Treatment plant to irrigate a portion of the adjacent golf course. Pahrump Utility Company (Hafen Ranch) currently uses the treated effluent to irrigate pastures for grazing but intends to pump the treated effluent to Mountain Falls to be used in golf course irrigation. It is recommended to use treated effluent as non-potable irrigation for golf courses, road medians, trails, parks, etc.

All trunk lines described below are proposed and do not exist at this time.

## 7.3 North District (ND)

The trunk sewer in this district is not installed. Existing sewer laterals can convey a portion of the ultimate sewage flow for a few years but trunk lines will ultimately have to be constructed. Sewage in this area currently flows to the North Treatment Plant (0.37 MGD Capacity) where it is treated. Expansion of this plant is possible but disposal of the treated effluent will become an issue with increasing the plant size. In the regional treatment plant approach, sewage flow from this district will flow west to Leslie Street, then south on Leslie Street to the regional treatment plant. Decommission of the existing treatment plant will be necessary when sewage is rerouted.

The existing 8-inch sewer line from Manhole N2.1 to LES10 will be adequate for quite some time, but will have to be paralleled, upsized, or rerouted in the future. It is possible to reroute flow from the lift station at Manhole N2.3 (Sub-district N2.2) either south to Pipe N1.1 or west paralleling the existing 8-inch sewer to Manhole LES10. Pipe N1.1 (24-inch) has the additional capacity to handle flow from Sub-district N2.2 if necessary. In either alternate, the lift station at Manhole N2.3 can be eliminated when the trunk lines are constructed.

If the trunk sewer line in Leslie Street is not constructed within a reasonable timeframe, short term solutions to service new development could include diverting sewage in the North District to the existing treatment plant and expanding the plant at Manhole N2.1 as needed. It is recommended that the trunk line be constructed as much as possible from the east to the west, then either gravity drained or lifted to the interim treatment plant at Manhole N2.1.

#### **7.4 Desert Utilities District (DD)**

There are existing sewer laterals that can convey a portion of the ultimate sewage flow for a few years time but trunk lines will ultimately have to be constructed. Sewage in this area currently flows to the Desert Utilities Treatment Plant (0.15 MGD Capacity) for treatment. Expansion of this plant is possible but disposal of the treated effluent will become an issue with increasing the plant size. In the regional treatment plant approach, sewage flow from this district will flow west to Leslie Street, then south on Leslie Street to the regional treatment plant. Decommission of the existing treatment plant and lift station will be necessary when sewage is rerouted.

If the trunk sewer line in Leslie Street is not constructed within a reasonable timeframe, short term solutions to service new development could include diverting sewage in the Desert Utilities District to the existing treatment plant and expanding the plant at Manhole D2.3 as needed. It is recommended that trunk lines be constructed as much as possible from the east to the west, then either gravity draining or lifting sewage to the Desert Utilities Treatment Plant at Manhole D2.3.

#### **7.5 East District (ED)**

There are existing sewer laterals in the southern third of this district that can convey a portion of the ultimate sewage flow for a few years time, but trunk lines will ultimately have to be constructed. There are no existing sewer line in the middle and upper parts of this district. Sewage in the southern third currently flows east on Basin Avenue to Blagg Road, then south to a lift station, which is then pumped to the Calvada Treatment Plant. In the regional treatment plant approach, sewage flow from this district will flow west to Leslie Street, then south on Leslie Street to the regional treatment plant. The lift stations on Blagg Road can be abandoned once the trunk lines are constructed.

Areas in this district west of Leslie Street are predominantly low density residential with lots 1-acre in size. Providing sanitary sewer service to this area with gravity systems will be an expensive burden to place on the 1-acre lot owners. Alternate sewer systems such as a small pressure system for only the liquid portion of sewage or a step system may be cost effective to construct. However, funding will be crucial to whatever system is installed to lower the costs to the land owners. USDA funding is available but would be limited to construction of only the laterals due to high costs of constructing trunk lines. The key to providing sewer service to this area is the trunk line in Leslie Street.

After the trunk line is constructed, smaller systems such as the pressure systems would be cost effective because gravity sewer outfall points in Leslie Street would be relatively close and inexpensive to connect into. Funding from sources such as the USDA would then become viable and would further reduce the cost to the land owners.

If the trunk sewer line in Leslie Street is not constructed within a reasonable timeframe, short term solutions to service new development would include diverting sewage to the Calvada Treatment Plant. Much of the development within this district is expected to occur near Hwy 160 and it is recommended that trunk lines be constructed as much as possible from the east to the west, then construct temporary lift stations to raise the flow to the Calvada Treatment Plant.

## **7.6 West District (WD)**

There are no existing sewer laterals or treatment plants in this district. There are no existing sewer lines in the middle and upper parts of this district. Sewage in the southern third currently flows east on Basin Avenue to Blagg Road, then south to a lift station, which is then pumped to the Calvada Treatment Plant. In the regional treatment plant approach, sewage flow from this district will flow west to Leslie Street, then south on Leslie Street to the regional treatment plant. The lift stations on Blagg Road can be abandoned once the trunk lines are constructed.

If the trunk sewer line in Leslie Street is not constructed within a reasonable timeframe, short term solutions to service new development could include diverting sewage to the Calvada Treatment Plan. Much of the development within this district is expected to occur near Hwy 160 and it is recommended that trunk lines be constructed as much as possible from the east to the west, then construct temporary lift stations to raise the flow to the Calvada Treatment Plant.

A large portion of this area is predominantly low density residential with lots 1-acre in size. Providing sanitary sewer service to this area with gravity systems will be an expensive burden to place on the 1-acre lot owners. Alternate sewer systems such as a small pressure system for only the liquid portion of sewage or a step system may be cost effective to construct. However, funding will be crucial to whatever system is installed to lower the costs to the land owners. USDA funding is available but would be limited to construction of only the laterals due to high costs of constructing trunk lines. The key to providing sewer service to this area is to construct a trunk sewer line to the regional plant or a district lift station to lift the sewage to the regional treatment plant. After the trunk improvements are constructed, smaller systems such as the pressure systems would be cost effective because trunk sewer outfall points would be relatively close and inexpensive to connect into. Funding from sources such as the USDA would then become viable and would further reduce the cost to the land owners.

## **7.7 Calvada District (CD)**

There are numerous existing sewer laterals in this district but due to the shallow depth, many cannot serve the adjacent areas with gravity sewer. The approach to the trunk sanitary sewage system in this district is to construct three new, deeper trunk lines that connect to existing laterals and direct sewage to the large diameter trunk line in Leslie Street. These three trunk sewer lines will ultimately eliminate the need for the numerous lift stations on Blagg Road and the treatment plant in Calvada.

Existing sewer laterals that will be undersized when development occurs are Pipes C2.4.1 and C2.4.4. The existing pipes are 8-inch lines while the trunk line sizes are 12-inch and 10-inch, respectively. It is recommended that a detailed analysis of the as-built inverts, sewer line locations, and existing houses be prepared to determine alternate solutions to the undersized mains. Due to the large number of existing laterals in this area, it may be possible to divert a portion of the flow in a new lateral, through undeveloped areas, to existing downstream laterals. This Plan did not analyze the feasibility of possible alternate routes because of the small area this affects, detailed as-built information is not available, and because the possible alternate routes would be in areas that the timeframe for development is unknown.

In the regional treatment plant approach, sewage flow from this district will flow west to Leslie Street, then south on Leslie Street to the regional treatment plant. The multiple lift stations on Blagg Road and the Calvada Treatment Plant will be able to be decommissioned once the trunk lines are constructed.

If the trunk sewer line in Leslie Street is not constructed within a reasonable timeframe, short term solutions to service new development would include increasing the capacity of the Calvada Treatment Plant. Much of the development within this district is expected to occur near Hwy 160 and it is recommended that trunk lines be constructed as much as possible from the east to the west, and to construct temporary lift stations or gravity mains to convey the flow to the expanded Calvada Treatment Plan

## **7.8 South District (SD)**

The only trunk sewer constructed in this district is in the Artesia Subdivision (Hafen Ranch, Sub-district SD-4.3) and Mountain Falls development (Sub-district SD-4.1). Both lateral and trunk lines convey sewage from existing lots in Artesia to an existing treatment plant owned by Pahrump Utility Company (Hafen). Mountain Falls (portions of Sub-district SD-3.1) has limited lateral and trunk lines that gravity flow to a temporary lift station that pumps to the existing treatment plant in Artesia (0.06 MGD).

Mountain Falls is currently planning for a treatment plant to be located on their site that would serve the Mountain Falls development, development east of Hwy 160, limited development north of Gamebird Road, and the America West parcel south of Mountain Falls. Since development in this area is imminent, it is recommended that Nye County

coordinates with the developers in this area and prepare a plan to combine county and developer resources in planning and constructing a portion of the regional treatment plant and trunk lines in the South District.

A large portion of this area south of Manse Road is predominantly low density residential with lots 1-acre in size. Providing sanitary sewer service to this area with gravity systems will be an expensive burden to place on the 1-acre lot owners. Alternate sewer systems such as a small pressure system for only the liquid portion of sewage or a step system may be cost effective to construct. However, funding will be crucial to whatever system is installed to lower the costs to the land owners. USDA funding is available but would be limited to construction of only the laterals due to high costs of constructing trunk lines. The key to providing sewer service to this area is to construct the trunk sewer line in Manse Road to the regional plant. After the trunk improvements are constructed, smaller systems such as the pressure system would be cost effective because trunk sewer outfall points would be relatively close and inexpensive to connect into. Funding from sources such as the USDA would then become viable and would further reduce the cost to the land owners.

In the regional treatment plant approach, sewage flow from this district will flow west directly to the regional treatment plant. The existing 0.2 MGD treatment plant in Artesia and the temporary lift station in Mountain Falls will be decommissioned within the next ten to fifteen years.

Interim solutions such as constructing treatment plants within Mountain Falls are not recommended. However, if necessary, increasing the capacity of the Artesia Treatment Plant is an interim solution if the regional treatment plant is not constructed.

## **8.0 COST ANALYSIS**

Providing a cost for the trunk system is not a part of the scope of this project but has been included to provide a general guide in the preparation of the Capital Improvements Plan (CIP) or for future Sewer Alternative studies.

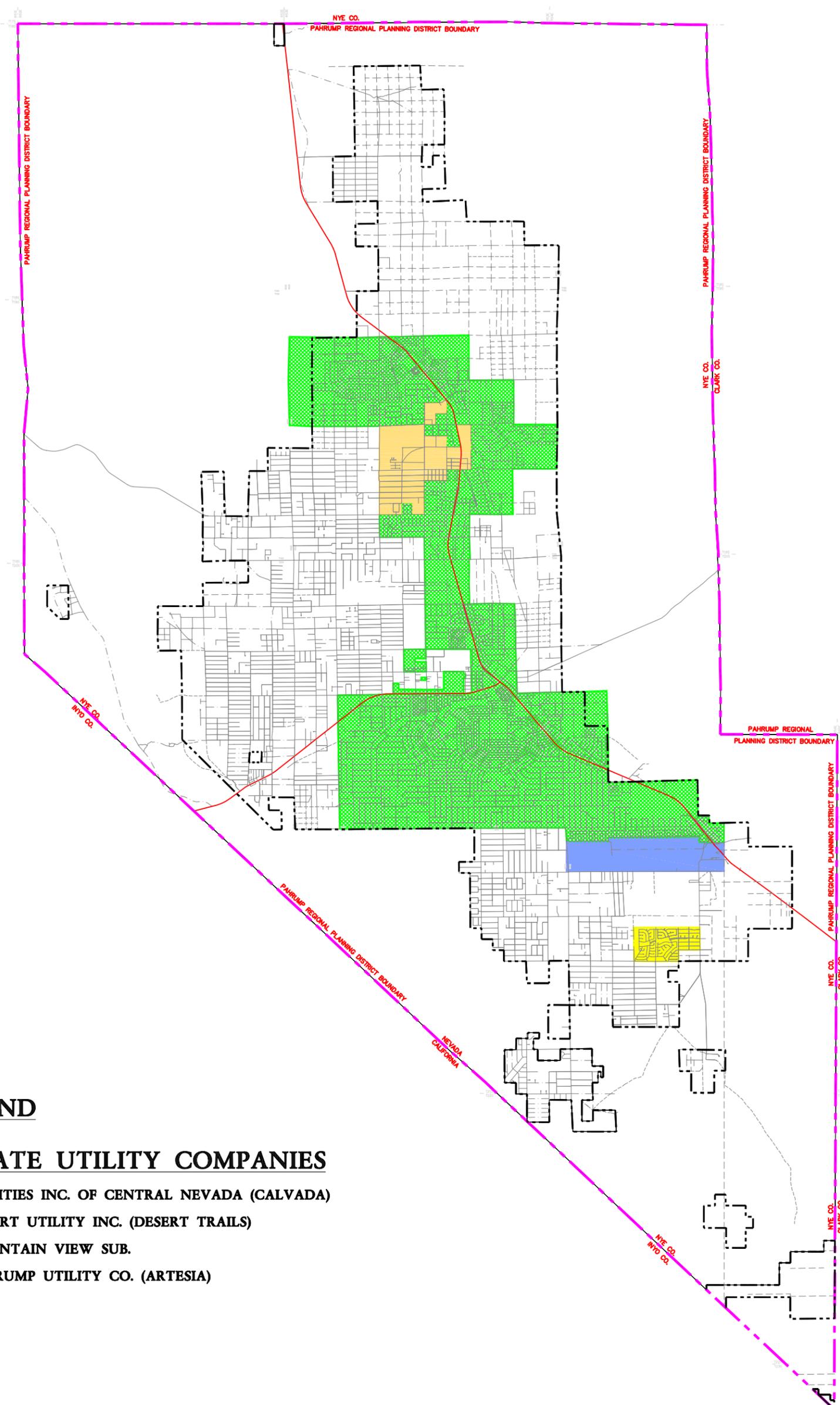
A summary of the cost estimates per district is presented in table format [See Sewer Figure #5, Pg 59] to help explain the magnitude of capital infrastructure that will ultimately need to be built to serve the project population. The unit costs per pipe size and estimated construction, legal, engineering, contingency, and administrative costs are also summarize to aid in future studies. [See Sewer Figure #6, Pg 60]

## **9.0 SUMMARY AND RECOMMENDATIONS**

The Sanitary Sewage Plan presented herein is intended to serve as an inventory of the existing sanitary sewer infrastructure in Pahrump and as a guide to construct a regional sanitary sewage system.

Pahrump was divided into six major districts with each district then divided into sub-districts. Unit rates of wastewater generation were assigned to each land use category and input into SewerCad to calculate average flows for each sub-district. The average flows for each section of trunk sewer line has been calculated in the preparation of this Plan.

The trunk sanitary sewage system is presented on Sewer Figure #4, Pg 58 of this report. The information on Sewer Figure #4 includes major districts and sub-districts, existing sewer infrastructure, proposed trunk sewers with sizes and direction of flow. Technical information including reference points at manholes with the flows are in the technical appendix, which is available at the Public Works Department. Adjustments in the routing and size of the trunk facilities can be expected as determined by the conditions at the time of final design; however, the general concepts should be adhered to for assurance of an economical and adequate ultimate system.



**LEGEND**

**PRIVATE UTILITY COMPANIES**

-  UTILITIES INC. OF CENTRAL NEVADA (CALVADA)
-  DESERT UTILITY INC. (DESERT TRAILS)
-  MOUNTAIN VIEW SUB.
-  PAHRUMP UTILITY CO. (ARTESIA)

**PAHRUMP EXISTING PRIVATE UTILITY COMPANIES SERVICE AREA MAP**

OCTOBER 25, 2004



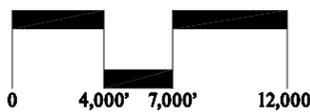
PREPARED BY:  
**TRI-CORE ENGINEERING**  
 8840 East Chaparral Rd., Suite 150  
 Scottsdale, AZ 85250  
 (480) 346-3200 Fax (480) 346-3201



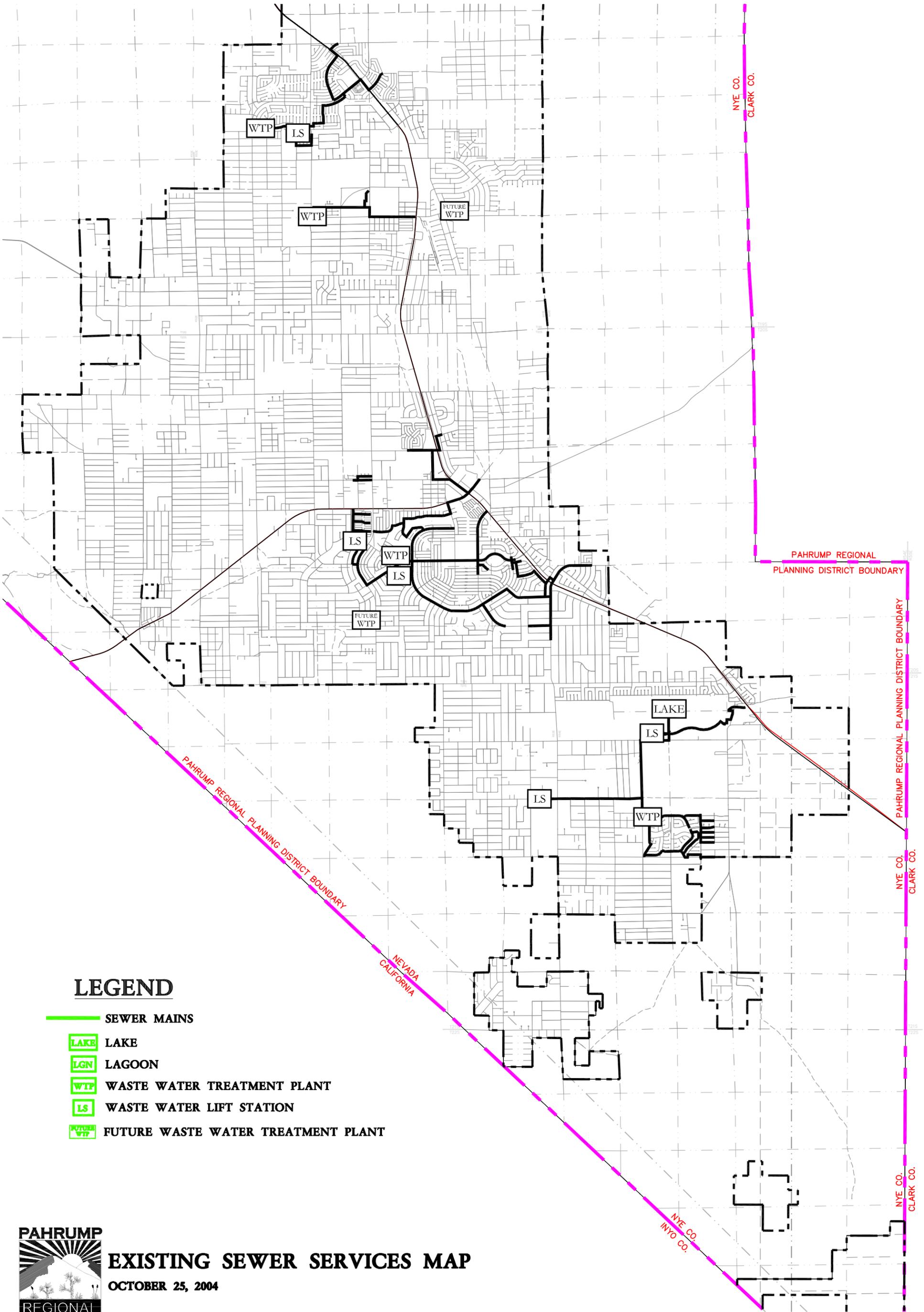
**TRI-CORE ENGINEERING**



NORTH

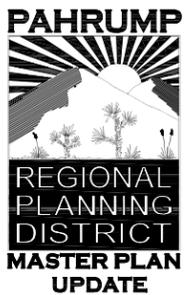


**ADEQUATE PUBLIC FACILITIES PLAN AND POLICY  
 NYE COUNTY, NEVADA**



### LEGEND

-  SEWER MAINS
-  LAKE
-  LAGOON
-  WASTE WATER TREATMENT PLANT
-  WASTE WATER LIFT STATION
-  FUTURE WASTE WATER TREATMENT PLANT



## EXISTING SEWER SERVICES MAP

OCTOBER 25, 2004

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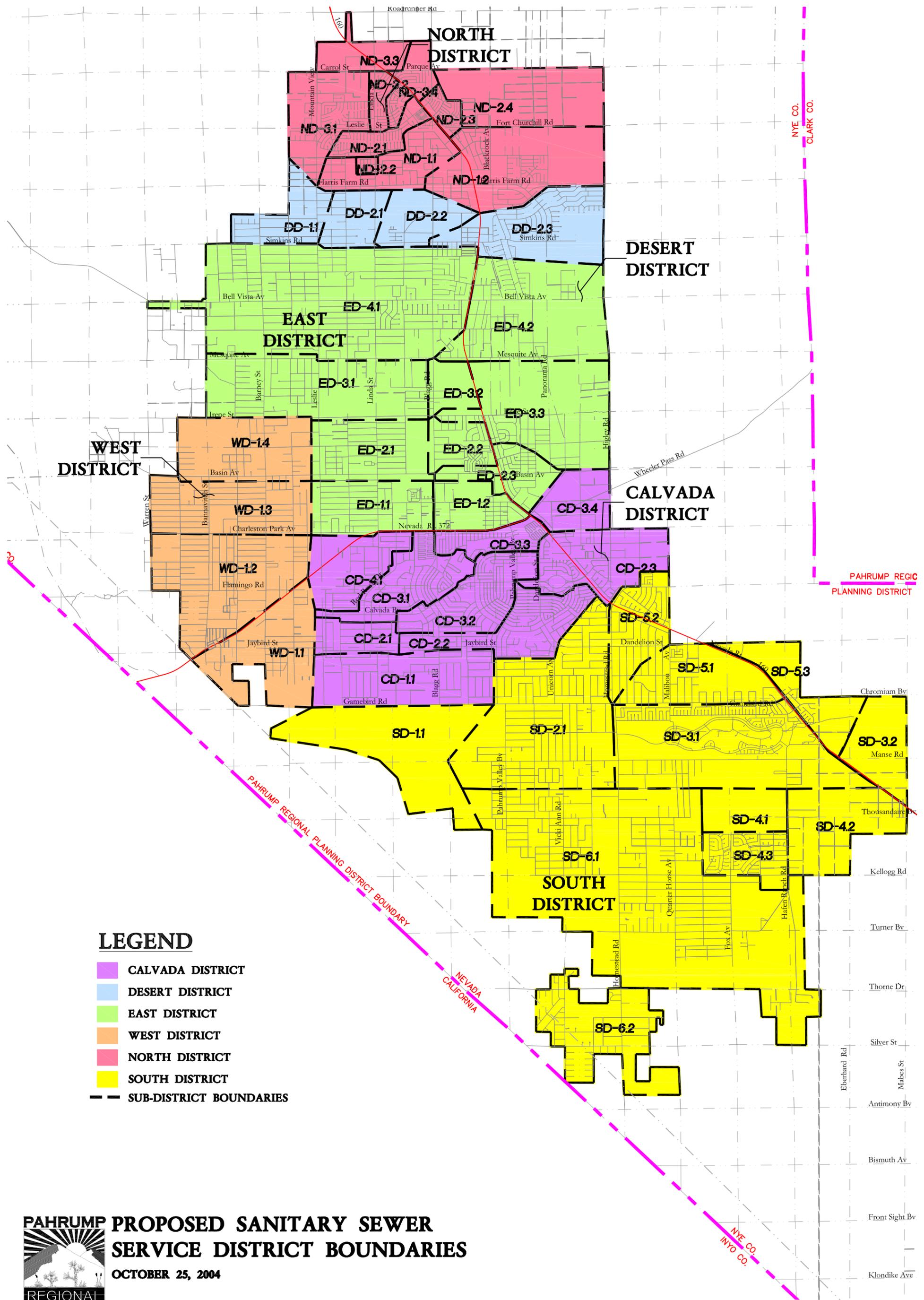
**TRI-CORE ENGINEERING**



NORTH 0 4,000' 7,000' 12,000'

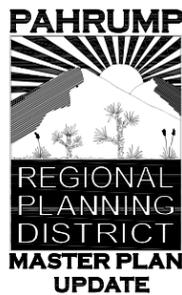
# ADEQUATE PUBLIC FACILITIES PLAN AND POLICY

## NYE COUNTY, NEVADA



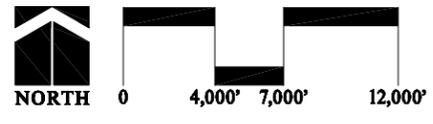
**LEGEND**

- CALVADA DISTRICT
- DESERT DISTRICT
- EAST DISTRICT
- WEST DISTRICT
- NORTH DISTRICT
- SOUTH DISTRICT
- SUB-DISTRICT BOUNDARIES

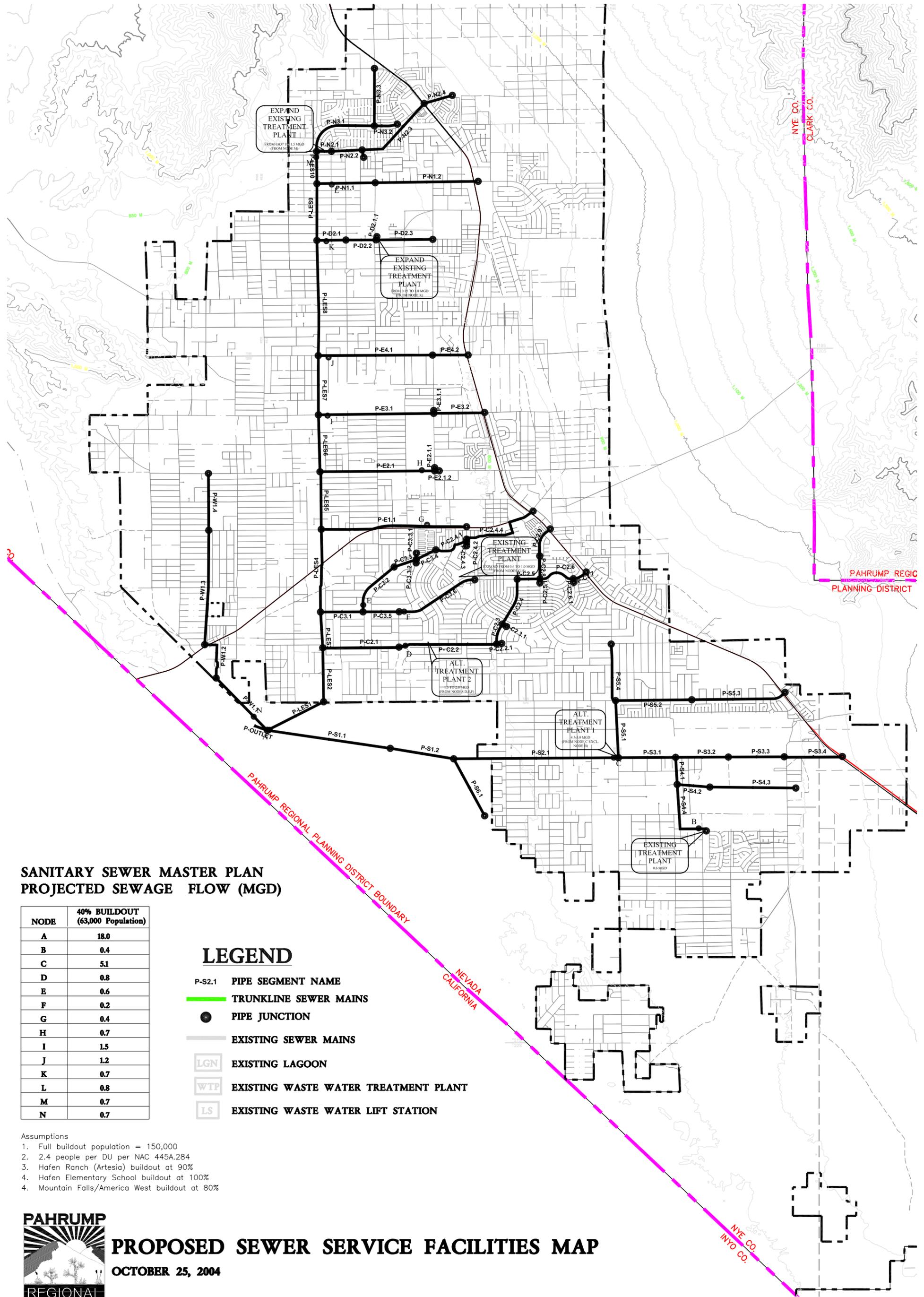


**PAHRUMP PROPOSED SANITARY SEWER SERVICE DISTRICT BOUNDARIES**  
**OCTOBER 25, 2004**

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**ADEQUATE PUBLIC FACILITIES PLAN AND POLICY**  
**NYE COUNTY, NEVADA**



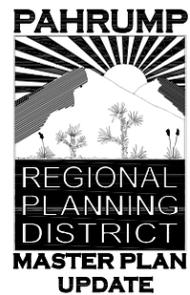
**SANITARY SEWER MASTER PLAN  
PROJECTED SEWAGE FLOW (MGD)**

NODE	40% BUILDOUT (63,000 Population)
A	18.0
B	0.4
C	5.1
D	0.8
E	0.6
F	0.2
G	0.4
H	0.7
I	1.5
J	1.2
K	0.7
L	0.8
M	0.7
N	0.7

**LEGEND**

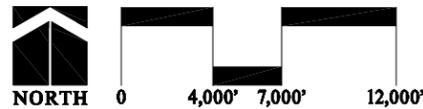
- P-S2.1 PIPE SEGMENT NAME
- TRUNKLINE SEWER MAINS
- PIPE JUNCTION
- EXISTING SEWER MAINS
- LGN EXISTING LAGOON
- WTP EXISTING WASTE WATER TREATMENT PLANT
- LS EXISTING WASTE WATER LIFT STATION

- Assumptions
1. Full buildout population = 150,000
  2. 2.4 people per DU per NAC 445A.284
  3. Hafen Ranch (Artesia) buildout at 90%
  4. Hafen Elementary School buildout at 100%
  5. Mountain Falls/America West buildout at 80%



**PROPOSED SEWER SERVICE FACILITIES MAP  
OCTOBER 25, 2004**

PREPARED BY:  
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**ADEQUATE PUBLIC FACILITIES PLAN AND POLICY  
NYE COUNTY, NEVADA**

**PROPOSED SEWER SERVICE TRUNK LINE DATA**  
**October, 2004**

Pipe ID	Length (ft)	Size	Cost/ft.	Non-Peaked Design Flow (cfs)	Peaked Design Flow (cfs)	Pipe Capacity (cfs)	Excess Capacity (cfs)	Cost
P-C2.1	7,044	18 inch	\$ 135	808,560	2,161,132	4,471,544	2,310,412	\$ 950,940
P-C2.2	9,054	18 inch	\$ 135	785,364	2,048,536	4,875,607	2,827,072	\$ 1,222,290
P-C2.3	1,960	18 inch	\$ 135	762,839	1,937,615	3,428,842	1,491,227	\$ 264,600
P-C2.4	4,496	15 inch	\$ 120	669,877	1,509,101	2,567,154	1,058,053	\$ 539,520
P-C2.4.1	3,244	12 inch	\$ 85	522,282	1,127,536	1,457,623	330,087	\$ 275,740
P-C2.4.2	256	12 inch	\$ 85	499,490	998,980	1,589,548	590,568	\$ 21,760
P-C2.4.4	7,922	10 inch	\$ 70	499,490	998,980	1,532,405	533,425	\$ 554,540
P-C2.5	2,102	12 inch	\$ 85	648,397	1,467,461	2,070,723	603,261	\$ 178,670
P-C2.6	3,406	8 inch	\$ 55	231,630	530,774	695,339	164,565	\$ 187,330
P-C2.8	2,124	10 inch	\$ 70	323,680	665,634	971,598	305,964	\$ 148,680
P-C2.9	2,874	8 inch	\$ 55	283,540	567,080	977,237	410,157	\$ 158,070
P-C3.1	3,930	18 inch	\$ 135	881,710	2,544,978	4,704,140	2,159,161	\$ 530,550
P-C3.2	5,396	18 inch	\$ 135	631,869	1,680,107	2,772,527	1,092,420	\$ 728,460
P-C3.3	2,160	15 inch	\$ 120	625,068	1,645,554	2,376,636	731,082	\$ 259,200
P-C3.4	2,014	15 inch	\$ 120	548,352	1,250,851	2,278,696	1,027,845	\$ 241,680
P-C3.5	3,336	12 inch	\$ 85	229,154	926,544	1,543,997	617,453	\$ 283,560
P-C3.6	7,824	10 inch	\$ 70	154,200	623,081	862,082	239,001	\$ 547,680
								\$ 7,093,270
P-D2.1	2,672	18 inch	\$ 135	738,762	2,392,745	3,714,645	1,321,900	\$ 360,720
P-D2.2	2,780	18 inch	\$ 135	693,018	2,203,558	3,254,757	1,051,199	\$ 375,300
P-D2.3	5,246	15 inch	\$ 120	437,774	1,576,721	2,961,052	1,384,331	\$ 629,520
								\$ 1,365,540
P-E1.1	13,452	12 inch	\$ 85	427,326	869,747	1,485,643	615,896	\$ 1,143,420
P-E2.1	10,588	15 inch	\$ 120	720,729	1,549,513	2,363,336	813,823	\$ 1,270,560
P-E2.1.2	5,542	12 inch	\$ 85	522,734	1,070,190	1,816,729	746,539	\$ 471,070
P-E3.1	10,648	18 inch	\$ 135	1,282,529	2,889,620	3,807,842	918,222	\$ 1,437,480
P-E3.2	4,702	15 inch	\$ 120	1,119,201	2,494,683	3,432,228	937,545	\$ 564,240
P-E4.1	10,552	18 inch	\$ 135	1,239,727	2,888,684	3,596,795	708,111	\$ 1,424,520
P-E4.2	3,280	15 inch	\$ 120	1,239,727	2,888,684	3,651,354	762,670	\$ 393,600
								\$ 6,704,890
P-LES1	5,836	48 inch	\$ 375	10,359,118	24,007,973	55,328,532	31,320,560	\$ 2,188,500
P-LES10	5,002	48 inch	\$ 375	10,254,175	23,687,595	29,380,160	5,692,565	\$ 1,875,750
P-LES2	3,316	48 inch	\$ 375	9,420,655	21,867,838	29,682,449	7,814,611	\$ 1,243,500
P-LES3	7,686	48 inch	\$ 375	8,236,315	19,253,456	29,345,233	10,091,777	\$ 2,882,250
P-LES4	5,354	42 inch	\$ 330	7,415,739	17,648,194	20,573,357	2,925,162	\$ 1,766,820
P-LES5	5,268	42 inch	\$ 330	6,406,577	15,608,401	20,565,742	4,957,341	\$ 1,738,440
P-LES6	5,484	36 inch	\$ 285	4,690,440	12,016,872	13,638,752	1,621,880	\$ 1,562,940
P-LES7	10,666	30 inch	\$ 240	2,445,946	7,201,624	8,384,335	1,182,710	\$ 2,559,840
P-LES8	5,256	24 inch	\$ 165	1,663,456	5,156,624	8,008,453	2,851,829	\$ 867,240
P-LES9	2,988	15 inch	\$ 120	699,292	1,887,663	3,095,772	1,208,109	\$ 358,560
								\$ 17,043,840
P-N1.1	5,386	18 inch	\$ 135	773,479	3,066,640	3,767,737	701,096	\$ 727,110
P-N1.2	9,500	15 inch	\$ 120	456,550	1,830,689	3,130,329	1,299,640	\$ 1,140,000
P-N2.1	1,370	12 inch	\$ 85	174,112	708,576	1,244,181	535,605	\$ 116,450
P-N2.2	2,840	10 inch	\$ 70	54,472	294,163	531,416	237,253	\$ 198,800
P-N2.3	7,600	8 inch	\$ 55	46,998	244,765	565,090	320,324	\$ 418,000
P-N2.4	3,214	8 inch	\$ 55	207,350	1,218,845	1,377,572	158,727	\$ 176,770
P-N2.5	7,572	12 inch	\$ 85	207,350	1,218,845	1,506,194	287,349	\$ 643,620
P-N3.1	6,890	15 inch	\$ 120	525,180	1,286,599	2,255,469	968,870	\$ 826,800
P-N3.2	2,134	10 inch	\$ 70	145,608	462,672	816,763	354,091	\$ 149,380
P-N3.3	5,320	10 inch	\$ 70	327,436	655,019	1,141,287	486,268	\$ 372,400
								\$ 4,769,330
P-S1.1	11,478	36 inch	\$ 285	6,608,470	14,525,788	24,141,003	9,615,215	\$ 3,271,230
P-S1.2	5,940	30 inch	\$ 240	6,436,508	14,193,453	18,617,775	4,424,322	\$ 1,425,600
P-S2.1	15,214	30 inch	\$ 240	5,146,117	10,810,692	18,772,744	7,962,052	\$ 3,651,360
P-S3.1	5,282	24 inch	\$ 165	3,858,171	8,209,348	9,501,914	1,292,565	\$ 871,530
P-S3.2	4,874	15 inch	\$ 120	617,290	1,234,580	2,307,518	1,072,938	\$ 584,880
P-S3.3	5,158	10 inch	\$ 70	617,290	1,234,580	1,380,134	145,554	\$ 361,060
P-S3.4	5,370	8 inch	\$ 55	617,290	1,234,580	1,389,551	154,971	\$ 295,350
P-S4.1	2,512	24 inch	\$ 165	1,638,292	3,940,511	6,581,268	2,640,757	\$ 414,480
P-S4.2	3,026	18 inch	\$ 135	1,243,818	3,033,382	4,905,515	1,872,133	\$ 408,510
P-S4.3	7,936	15 inch	\$ 120	811,154	1,968,512	3,864,508	1,895,995	\$ 952,320
P-S4.4	7,240	12 inch	\$ 85	394,474	1,171,419	1,320,180	148,760	\$ 615,400
P-S5.1	5,286	24 inch	\$ 165	1,287,946	2,951,246	6,789,680	3,838,435	\$ 872,190
P-S5.2	7,036	15 inch	\$ 120	1,072,841	2,330,079	2,633,641	303,562	\$ 844,320
P-S5.3	8,808	12 inch	\$ 85	667,300	1,377,589	2,081,812	704,222	\$ 748,680
P-S5.4	5,428	10 inch	\$ 70	215,105	732,543	1,156,693	424,150	\$ 379,960
P-S6.1	5,998	24 inch	\$ 165	882,515	2,958,867	6,727,584	3,768,717	\$ 989,670
								\$ 16,686,540
P-W1.1	6,762	18 inch	\$ 135	702,077	2,733,401	3,036,700	303,298	\$ 912,870
P-W1.2	4,270	18 inch	\$ 135	500,462	2,170,243	2,628,249	458,006	\$ 576,450
P-W1.3	10,598	15 inch	\$ 120	197,038	1,039,356	1,787,578	748,222	\$ 1,271,760
P-W1.4	5,262	10 inch	\$ 70	101,089	562,405	647,418	85,013	\$ 368,340
								\$ 3,129,420
<b>Grand Total</b>								<b>\$ 56,792,830</b>

Denotes Subtotals

**Sewer Figure 5**

Prepared by:  
 Tri-Core Engineering  
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**TYPICAL COSTS FOR SEWER TRUNK LINES**

October, 2004

Size (Inches)	Construction Cost* (Per linear foot)
8	\$55
10	\$70
12	\$85
15	\$120
18	\$135
21	\$165
24	\$195
27	\$220
30	\$240
36	\$285
42	\$330
48	\$375

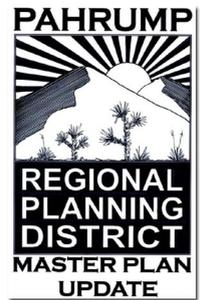
- \* - Prices duplicated from Town of Gilbert Waterwater Master Plan - 2005
- Includes manholes, pipe, administration, engineering, and contingency costs
- Price adj. by 68.7% of National Average of Means For Installations Costs

**PRECAST CONCRETE MANHOLE-T-LOK LINED**

5' ID DEPTH-'	UNIT (\$)
10	\$4,086
12	\$4,613
14	\$5,139
16	\$5,665
18	\$6,191
20	\$6,718
22	\$7,244
24	\$7,770
26	\$8,297
28	\$8,823
30	\$9,349
32	\$9,875

# Pahrump

## Regional Planning District



# Water System Plan

August 7<sup>th</sup>, 2006  
5<sup>th</sup> DRAFT



**“Heart of the New Old West”**

# **Water Distribution System Plan**

## **FINAL REPORT**

**5<sup>th</sup> Draft**  
August 7<sup>th</sup>, 2006

Prepared For:  
**Nye County, Nevada**

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**WATER DISTRIBUTION SYSTEM PLAN  
Pahrump Regional Planning District  
Nye County, Nevada**

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## **WATER DISTRIBUTION SYSTEM PLAN**

### **1.0 INTRODUCTION**

This section of the Adequate Public Facilities Plan contains the Water distribution system Plan for the Pahrump Regional Planning District. The Planning District comprises essentially the same area as the sanitary sewer system Plan discussed previously. It has the same approximately 90 square miles and a current population of approximately 32,000 people. The population of the Planning District is projected to ultimately be nearly 150,000 people. This population increase will place a significant burden on the existing water facilities. Nye County has identified the need to Plan water infrastructure in the Planning District to ensure proper sizing and placement of infrastructure and to provide the interconnectivity of the numerous existing water systems.

The water distribution system Plan is intended to provide Nye County a guide for the expansion of and connection of the numerous existing water systems in Pahrump. The development of a water system capable of supplying and distributing potable water of high quality and fire protection to all points of demand at acceptable pressures requires much planning and design. Such a system is dependent upon a strong network of trunk water mains complemented by properly sized and strategically located supply and storage facilities. A Water distribution system Plan based on the most reliable information presently available is necessary to ensure that adequate facilities are provided during the anticipated growth of Pahrump and to allow flexibility for future improvements. Without proper planning, haphazard and piecemeal construction can result in either undersized or oversized facilities. Either condition is very costly to a community since a water main that is too large is not fully utilized, while a main that is too small will eventually have to be paralleled. The Plan will minimize these problems and will establish continuity in the development of an ultimate system by serving as a guide for future expansions and additions.

This report presents a water supply and distribution system for build out of the Planning District. The plan recommends a combination of supply, storage, and distribution system improvements that will adequately serve the planning area both near-term and projected.

#### **1.1 Water Supply and Water Rights**

In February, 2002, the Nye County Water Resources Plan (WRP) was completed by Thomas S. Buqo, Consulting Hydrogeologist. The Water Resources Plan included the Pahrump Valley Hydrographic Basin. The Nye County WRP is designed as a tool to guide the development, management, and use of the County's water resources. The plan sets forth the goals and guidelines for planning, defines the water resources and issues related to those resources, and provides specific alternatives and

recommendations for the long-term management of those resources. The plan was developed in cooperation with the Nevada Division of Water Planning and the Nevada Division of Water Resources.

The following is a summary of several key issues for the Pahrump Valley Hydrographic Basin.

- Presently, the only source of potable water in Pahrump Valley is from groundwater pumped from the Valley Fill Aquifer.
- With a projected population of 150,000 by the year 2050, the water demand is estimated to be 80,000 acre-feet per year for Pahrump Valley. Overdraft of the aquifer will occur.
- The existing groundwater rights of 69,000 acre-feet are not sufficient to meet the projected demand.
- Reconciliation of the water supply/demand will have to be made.

## **2.0 EXISTING MUNICIPAL WATER SYSTEMS**

Currently there is no municipal water distribution system or Plan for the Planning District. Existing subdivisions either both constructs and operates their own system or the subdivision is designed to accommodate individual wells on the lots. The Plan area currently has four existing utility service areas serving existing/future developments. The four utility providers are:

Desert Utilities Inc. (Desert Trails)

Pahrump Utility Company (Hafen Ranch)

Mountain Falls Subdivision Area (Mountain Falls)

Public Utilities Inc. (Calvada)

See Water Figure #1, Pg 75, for existing service areas and infrastructure. Each service area has associated production wells, storage facilities, and distribution mains. The remaining areas are served by either individual domestic wells or the land is vacant.

The Nye County WRP estimates that as of 2002 there were 8,300 domestic wells within the Planning District. An additional 600-700 new domestic wells are being drilled every year. Over the next 50 years as many as 20,000 additional domestic wells may be drilled. These new well could use up to 28,000 acre-feet of additional water per year.

According to the Nye County WRP, these wells will place a significant burden on the groundwater supply

### **3.0 WATER GOALS, OBJECTIVES, PURPOSES, POLICIES AND IMPLEMENTATION**

**GOAL #1:** Provide water planning to ensure potable water supplies/facilities are provided to all residential and non-residential structures in the community.

**Objective-A:** Identify sites for future municipal water treatment plants and storage.

**Objective-B:** Examine the possibility of connecting and modifying the existing private water systems to make one municipal system.

**Objective-C:** Utilize computer software for modeling of the water system hydraulics to analyze existing facilities and map future facilities.

**Objective-D:** Create GIS mapping of the existing and proposed facilities.

#### **Purpose:**

The purpose of the following policies is to meet the projected water demand for Pahrump. This includes providing the community with high quality potable water, assuring adequate distribution and flow of water for fire protection, and in developing water efficiency programs to conserve water.

**Policy 1:** It is the policy of Nye County to coordinate planning efforts with the private water providers to identify priority areas in Pahrump for potable water facility expansion and upgrading.

**Policy 2:** It is the policy of Nye County to require that new developments provide adequate potable water infrastructure facilities that could eventually connect with a main potable water distribution system.

**Policy 3:** It is the policy of Nye County that private water providers shall coordinate with the Pahrump Fire Department to ensure that water distribution facilities are adequately sized to accommodate fire flow requirements.

**Policy 4:** It is the policy of Nye County to cooperate with the State and the private water providers in water conservation efforts.

**Policy 5:** It is the policy of Nye County to cooperate with the private water providers to develop standards for the sensitive integration of potable water facilities, such as pump stations and well sites within Pahrump. Such standards

may include buffering from adjacent development, screening of facilities, provision of access for maintenance and integration with desert landscaping.

**Policy 6:** It is the policy of Nye County that new planned areas and non-residential lands be connected to a community water distribution system.

**Implementation Action:**

Regional Water Distribution Plan: Nye County shall explore the necessary steps to develop a Regional Water Distribution Plan. The necessary steps are outlined below.

- Utilize GIS to develop mapping and an inventory of the existing facilities.
- Pursue the creation of a Water Conservation and Public Awareness Program as suggested by the Nye County Water Resources Plan.
- Discuss creation of a single municipal water distribution system for Pahrump.
- Explore with stakeholders and agencies and develop an appropriate funding mechanism and new utility organizational structure in connection with the development of a CIP

## **4.0 SCOPE OF DISTRIBUTION ANALYSIS**

A water system can be divided into three categories. These categories are:

- Supply and Treatment Facilities
- Storage Facilities
- Distribution Facilities

**Supply Facilities:**

Supply facilities include all equipment necessary to produce the required amounts of treated water for distribution. Supply facilities include wells, pumps, pump houses, controls, water treatment facilities, raw water transmission mains, and related works. For the plan area, it is proposed to consider ground water supply sources only since surface water is not available. The groundwater supply in the plan area has been previously studied in the Nye County Water Resources Plan (WRP) dated February, 2002 prepared by Thomas S. Bugo, Hydrogeologist. Recommendations from the WRP have been incorporated in the approved Plan. Acquisition of the necessary water rights for ultimate conditions is not part of this plan.

**Storage Facilities:**

The storage facilities are the tanks and underground reservoirs used throughout the system to store water for usage during emergency and peak conditions. Water from storage is fed into the distribution system by either gravity or by pumping through a booster station. Existing storage facilities in the plan area include booster stations such as the one owned and operated by the Pahrump Utility Company for the Artesia at Hafen Ranch subdivision and a gravity system such as Mountain Falls and Calvada.

### **Distribution System:**

The distribution system is made up of the trunk water mains (primarily made up of 12 inches in diameter or larger), lateral water mains (primarily made up of 8 and sometimes 12 inches in diameter or smaller), service lines, valves, pressure reducing stations, hydrants, and all appurtenances necessary to convey water from the storage facilities to the points of demand. Since lateral water mains typically are routed along residential streets within a development, it is impractical to try to predict the future location of the streets. It is therefore necessary to exclude these future lateral lines from consideration in analyzing the distribution system hydraulics. However, it may be necessary to include a portion of the existing lateral water mains in the plan area to construct a more accurate hydraulic model of the existing and proposed system hydraulics.

The Water Plan utilizes the following steps to determine water trunk sizing:

- Determine the ultimate water demands (from the land use map), production capacity required, and storage required to meet the demands.
- Identify water main locations in relation to transportation corridors.
- Create a water distribution computer model of portions of the existing system and the ultimate water system.
- Hydraulically analyze the ultimate system to ensure adequate residual pressures.
- Recommend water distribution system infrastructure improvements such as line sizes, storage tank size, production well locations, and pressure zone boundaries.

This plan is organized as follows:

- **Water Demands:** This section explains the derivation of near-term and ultimate water demands. Included are descriptions of land use, population projections, and projected water usage per land use.
- **Existing Facilities:** This section describes existing water system facilities, wells, pumphouses, storage facilities, and the distribution system.

- **Proposed Facilities:** This section provided details of the proposed water system infrastructure, production well locations, storage facilities, and the distribution system. This section will also summarize the hydraulic analysis performed.
- **Summary and Recommendations:** This section will containS a brief summary of the final report and recommendations.
- **Mapping and ARC/INFO overlays**

#### 4.1 Water Distribution Districts

We have identified four major water distribution districts in the planning area, each defining the limits of service for a separate proposed water system system. These districts were further subdivided into smaller sub-districts that were used to develop design demands and to determine cumulative design demands in the various distribution blocks. The major water districts and their corresponding prefix abbreviations are given below in Table 1.

**Table 1 – Potable Water Districts**

Water Districts	Abbreviation
North District	ND
Middle District	MD
Calvada District	CD
South District	SD

The boundaries of all the minor districts are inclusive of all area to be serviced with in the planning area. [See Water Figure #2, Pg 76] Development of a new regional distribution system will require phasing. It may be determined in the future phasing acquisition exiting facilities may be required to reduce the operating costs and redundancy.

## 5.0 ANALYSIS LAND USE AND POPULATION

Capacity requirements for the three water system components (supply, storage, and distribution) are dictated by the demands placed on them by the land use. The design

of the water distribution system for the plan is based on the estimates of ultimate water demands. Water demand, both peak and average, is affected by many factors including population, population distribution, commercial and industrial activity, climate, soil conditions, and the condition of the existing system. The most important factor is land usage (population, population distribution, and densities) which will be used as a basis for determining water demand.

## 5.1 Land Use

The Land Use Master Plan served as a basis for development of the potable water trunk main line system. (as in the sewer plan) Table 2, below presents a description of the future land uses utilized to estimate potable water demands. The wildlife habitat reserve and parks/open space land uses do generate water demand and have therefore been included in hydraulic calculations in this plan. The plan is designed to be a living document and subject to modifications, but the sewage system plan has limited flexibility to accommodate changes once it has been constructed, especially trunk lines.

**Table 2 – Land Use Type Descriptions**

1)	Rural Residential – Single family lots with five-acre minimum lot size.
2)	Low Density Residential – Single family residential on lots with one-acre minimum lot size
3)	Medium Density Residential – Single or multifamily residential on lots less than one acre, but greater than 8000 square feet.
4)	Multi-Family Residential – This area is characterized by high-density residential uses
5)	Mixed Use – A mix of commercial/office/residential uses are allowed to provide a more dense, urban core, with pedestrian amenities, trails, sidewalks and places for residents to live, work, and play. Commercial uses are at neighborhood scale, prohibiting “big box” buildings greater than 80,000 square feet. Residential development of single or multi-family housing is allowed.
6)	General Commercial – Activities involving the sale of goods and services, including liquor sales, automobile sales and repair, movie theaters, large-scale retailers, hotels, restaurants, gas stations, malls, sexually orientated businesses, big box retail and casinos.

7)	RV Parks/Commercial – This area is characterized by RV lots as commercial uses.
8)	Business Parks – Area dedicated to business development, serving companies with compatible and complementary services. These will be planned developments, with landscaped, attractive areas, that can accommodate neighborhood-scale commercial uses, including restaurants and small-scale retail, such as bakeries or copy shops in addition to light industrial uses.
9)	Heavy Industrial – Industrial uses including manufacturing, constructions, production, wholesale trade, storage yards and transportation.
10)	Institutional – Institutional includes civic buildings, public utility facilities, schools, and emergency facilities.

The land use map represents ultimate build-out with a population estimated at 150,350 people. The projected population in the year 2025 is over 63,901 people, which is approximately 42% of the ultimate population. Pahrump historically has experienced development in an unpredictable, random pattern throughout the planning area. For this reason, it is assumed that the development of vacant land within the land use designations will be at 40%, with the exception of 1000-acre Mountain Falls, the 1100-acre America West parcel, and the 900-acre Hafen subdivisions. These areas have and will experience significant growth over the next 30 years. Build-out for these areas are estimated to be 100%. Table 2, below presents a gross area of the future land uses utilized to estimate the volume of water flow.

**Table 3 – Summary of Land Uses by Gross Area**

Use	Gross Acres
-----	-------------

Rural Residential (5-acre lots)	18,500
Low Density Residential	34,820
Medium Density Residential	20,970
Multi-Family Residential	119
Commercial/Mixed Use	13,085
General Commercial	4,106
Commercial (Brothel)	345
RV Parks/Commercial	172
Business Parks	4,300
Heavy Industrial	2,190
Parks	1,265
Wildlife Reserve	4,850
Municipal	700

## 5.2 Population

As discussed previously, predicting the future population for any local is difficult. Nye County's population in 1990 was 7,424 and topped out at 30,000 in 1998. Between 1990 and 2001, Nye County experienced an 89% growth rate. Growth rates of this intensity cannot be expected to be sustained throughout the next thirty years. Watermain trunk line sizing based on low population projections will result in undersized trunk lines, which would need to be paralleled. For planning the water distribution system, the approved population projects based on their landuse assumptions dictate a population in excess of 63,000 in 2025 and an ultimate population 150,350. This population projection is conservative but will prevent costly replacement and/or paralleling of undersized trunk lines, however the trunk system should be reviewed against real growth data as it is being developed.

## 6.0 WATER DEMANDS AND DESIGN CRITERIA

### 6.1 Water Demand

Future water usage is projected according to population and land use. Each of the land use categories in Table 3 was examined with consideration given to population density, irrigation, and other activities likely to occur within the projected land use. The categories have average demands of commercial, brothel, residential, and others of 100, 231, 240 and 360+ gallons per day respectively. Water demand was then calculated base on these unit demand rates per acre. The resulting rates, which were used in analyzing the trunk water distribution system, are presented in Table 4 below.

**Table 4 – Future Water Demand Rates**

Land Use Category	DU's per acre	Capita per DU	Gallons per Day per acre	Demand Rate (gpm/acre)		
				Average Daily Demand	Maximum Daily Demand	Peak Demand
Rural Residential (5-acre lots)	0.2	2.4*	N/A	N/A	N/A	N/A
Low Density Residential	1	2.4*	580	0.41	1.03	1.64
Medium Density Residential	3	2.4*	1730	1.23	3.06	4.90
Multi-Family Residential	8	2.4*	4610	3.27	8.16	13.06
Commercial/Mixed Use (80% Res 20% Com.)	0.2	50	2400	1.70	4.25	6.80
General Commercial	0.2	80	1600	1.13	2.83	4.53
Commercial (Brothel)	0.2	100	4610	3.27	8.16	13.06
RV Parks	3	2.4	3840	2.72	6.80	10.88
Business Parks	0.1	100	2400	1.70	4.25	6.80
Heavy Industrial	0.1	190	4560	3.23	8.08	12.92
Parks	1	10	3600	2.55	6.38	10.20
Wildlife Reserve	N/A	N/A	N/A	N/A	N/A	N/A

Municipal (Schools)	N/A	N/A	N/A	Schools are load based on actual size		
Institutional	0.2	25	1600	1.13	2.83	4.53

\* Taken from US Census Data in 2000 for Nye County

Total water usage for designated points of demand, on the water distribution system was determined for the purpose of hydraulic analysis and system design. This was accomplished by dividing the plan area into sub-areas whose total demand was assumed to be located at a designated point in each sub-area. The sub-areas were then further subdivided into the various land use categories, based on the land use map. By applying the unit demand rates from Table 3 and the buildout factors discussed above, the total demand for each sub-area was developed. The average demand, maximum daily demand, and the peak demand for all designated points within the Plan area have been calculated in the preparation of this plan.

## 6.2 Design Criteria for Distribution and Storage Facilities

The maximum daily demand values along with the following criteria are used for sizing of distribution and storage facilities:

### Distribution

- Peaking Factor of 2.5 for average day demand to maximum day demand
- Peaking Factor of 4 for average day demand to peak hour demand
- 20 psi residual during fire flow during maximum day demand (NAC 445A.6672).
- 30 psi residual during peak hour demand (NAC 445A.6672)
- 40 psi residual during maximum day demand (NAC 445A.6672)
- Maximum water velocity at 8 ft/s during all flow conditions except fire flow (NAC 445A.6672)

### Storage

- Set operating storage at 700 gallons for each dwelling unit (metered system) Operating storage was set using NAC 445A.66745
- Set Emergency reserve at 75% of the amount of operating storage. Emergency storage was set using NAC 445A.6675

Water usage for fire demand is also a vital consideration in the design of a water supply and distribution system. Fire demand varies greatly from normal usage in that an extremely large quantity of water is required from a single demand point in a very short time. The quantity of water used for fires is almost negligible when compared to other usage categories, but because of the extreme rate of usage during an emergency situation, fire demands frequently govern design. Fire demands ranging from 2,500 to 4,000 gpm over periods of 2.5 to 4 hours were incorporated into the design of the water distribution system. [See Water Figure #4 thru Water Figure #6]. Fire flows were set using Uniform Fire Code, since most of our lines were on section lines we could not use 1,750 gpm (residential homes less than 3600 sf) because there were commercial areas within the section.

## **7.0 EXISTING FACILITIES**

As indicated previously the plan area currently has four existing utility providers. Each service area has associated wells, treatment facilities (limited to disinfection only), distribution lines (8 to 18-inch lines), and storage facilities. The following is a summary of each utility service area and the existing watermain facilities.

### **Desert Utilities Inc.**

- Ground level tank with 212,000 gallon capacity
- Two supply wells with pumping rates of 450 gpm and 600 gpm
- Water treatment located at wells
- Pressure system for distribution

### **Pahrump Utility Company (Hafen Ranch)**

- Ground level tank with 500,000 gallon capacity
- Two supply wells with pumping rates of 370 gpm and 350 gpm
- Water treatment located prior to wells discharging into tank
- Pressure system with variable speed pumps for distribution

### **Mountain Falls Subdivision (Mountain Falls)**

- Ground level tank with 1,000,000 gallon capacity
- Two supply wells
- Water treatment located at wells

- Gravity feed system for distribution

#### **Public Utilities Inc. (Calvada)**

- Two ground level tanks with 750,000 gallon and 1,000,000 gallon capacity
- Multiple supply wells
- Water treatment located at wells
- Gravity feed system for distribution with two pressure zones
- Lower pressure zone connected to the smaller tank and high pressure zone connected to the larger tank

#### **Public Utilities Inc. (North Pahrump)**

- Ground level tank with 4,000 gallon hydropneumatic
- Multiple supply wells
- Water treatment located at wells
- Hydro-pneumatic tank for pressurizing distribution system
- Future plans include a 500,000 gallon ground level tank at Ft. Churchill Road and Blackrock Ave.

## **8.0 PROPOSED FACILITIES**

Pahrump's water system was analyzed in detail using WaterCad, a hydraulic computer modeling program by Haestad Methods. The model analyzed the entire system, including tanks, and distribution mains and analyzed the system through a steady state model during the design average day demand, maximum day demand, and fire flows (Per NAC at least 20 psi during condition of fire flow and fire demand experienced during maximum day demand; at least 30 psi during peak hour demand; and at least 40 psi during maximum day demand). Hydraulic analysis was performed by the model using the Hazen-Williams energy loss formula and the Hardy Cross procedure. The Hardy Cross procedure is an iterative process in which both flows and energy losses are balanced throughout the entire system.

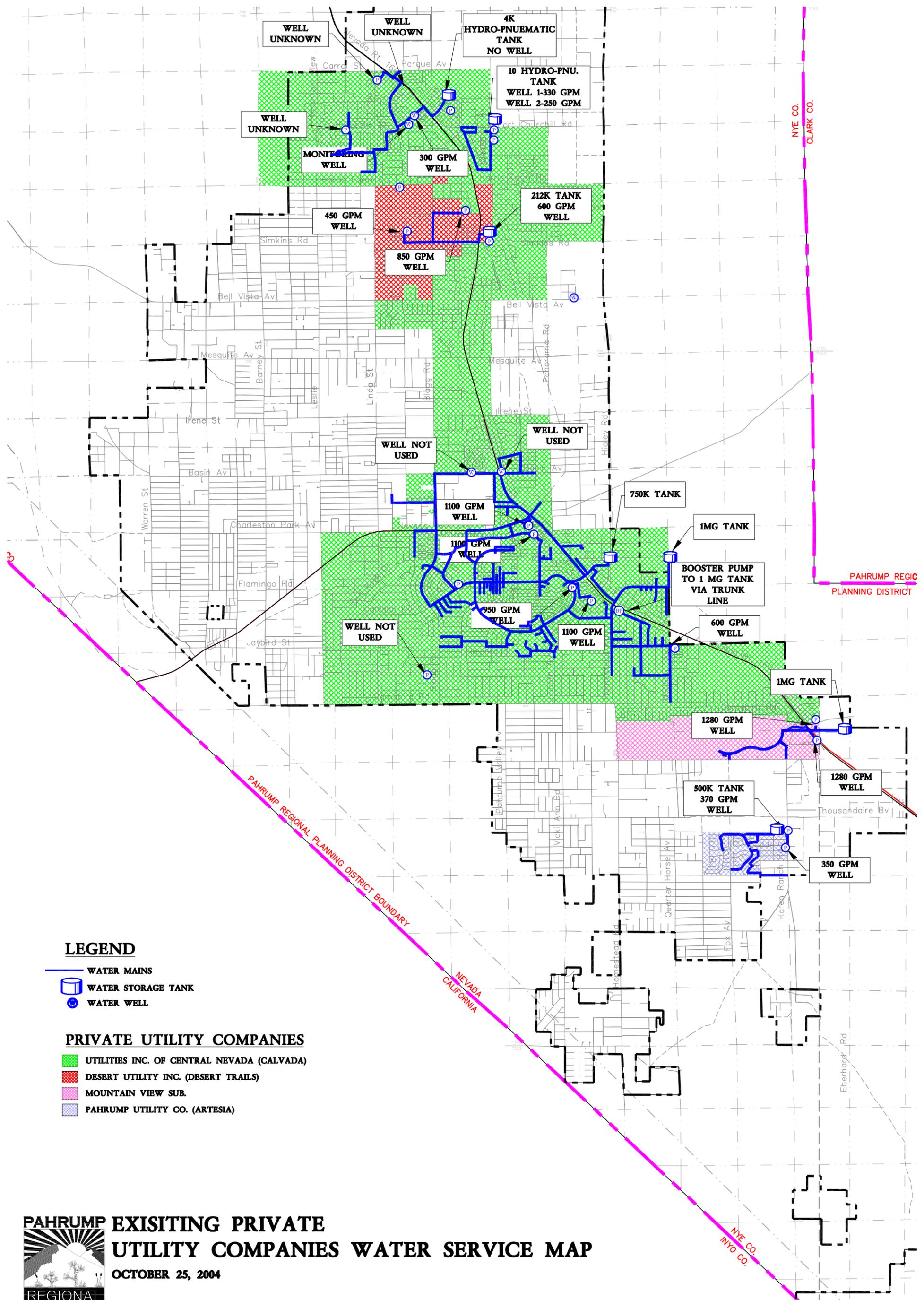
Input for the computer model includes pipe sizes and lengths, point supplies and demands, storage tank characteristics, and ground elevations.

## **9.0 SUMMARY AND CONCLUSIONS**

The Water Distribution System Plan presented herein is intended to serve as an inventory of the existing water infrastructure in Pahrump and as a guide to construct a central water system.

Pahrump was divided into four regions with three pressure zones. Each region has multiple nodes for inputting the water demand. Water demand rates were assigned to each land use category and assigned to the nodes, then applied to WaterCad to calculate average demand for each node

The trunk water distribution system is presented at the back of this report. The information includes the four regions, nodes, existing water infrastructure, and proposed trunk watermain. Detailed information regarding each node and pipe are provided in the technical appendix, which is available at the Public Works Department. Adjustments in the routing and size of the trunk line facilities can be expected as determined by the conditions at the time of final design; however, the general concepts should be adhered to for assurance of an economical and adequate ultimate system



**LEGEND**

- WATER MAINS
- WATER STORAGE TANK
- WATER WELL

**PRIVATE UTILITY COMPANIES**

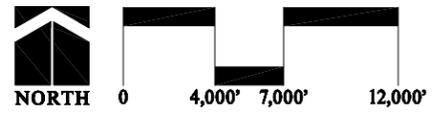
- UTILITIES INC. OF CENTRAL NEVADA (CALVADA)
- DESERT UTILITY INC. (DESERT TRAILS)
- MOUNTAIN VIEW SUB.
- PAHRUMP UTILITY CO. (ARTESIA)

**PAHRUMP EXISTING PRIVATE UTILITY COMPANIES WATER SERVICE MAP**

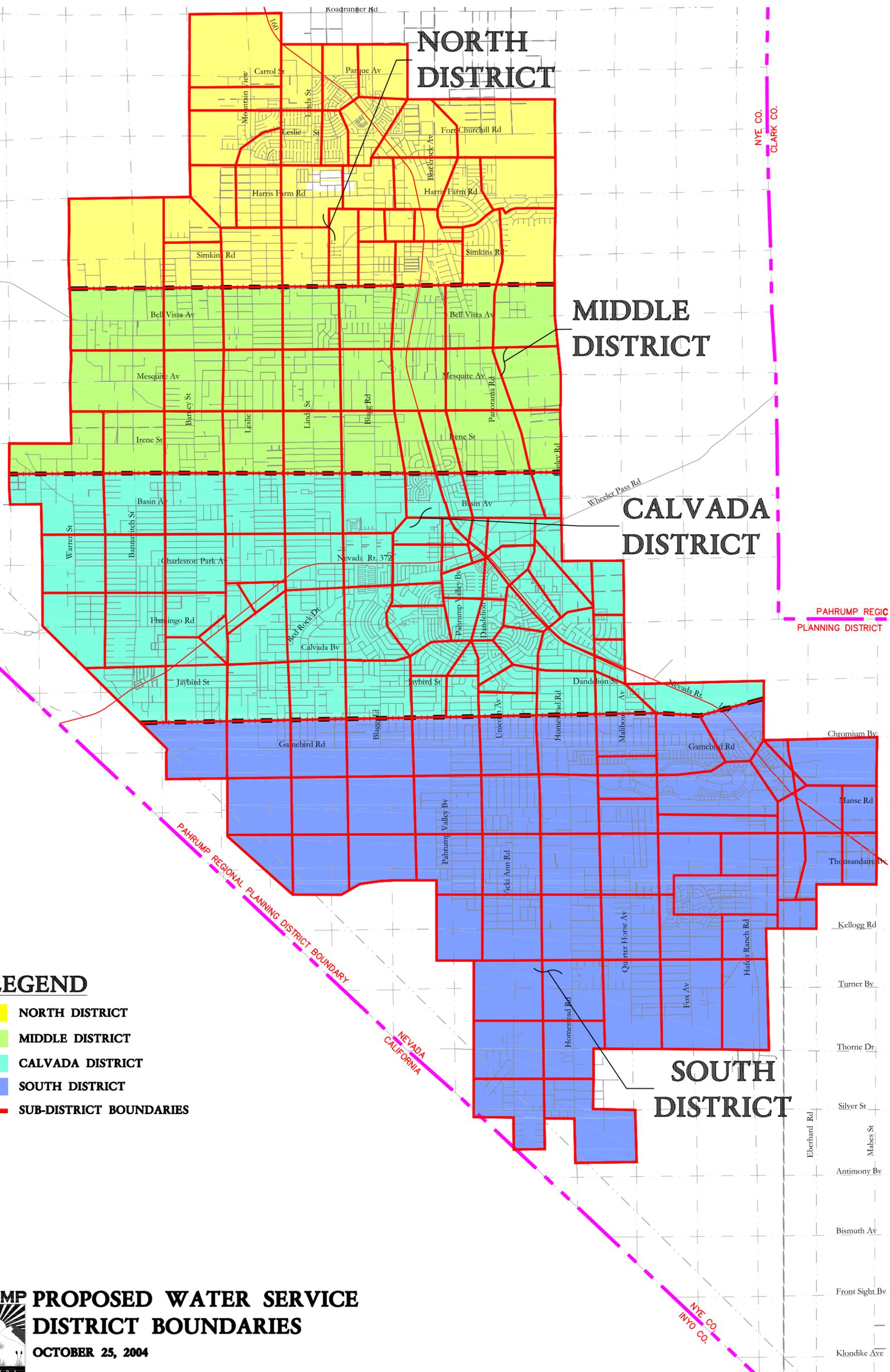
OCTOBER 25, 2004



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**ADEQUATE PUBLIC FACILITIES PLAN AND POLICY**  
 NYE COUNTY, NEVADA



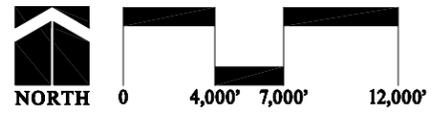
- LEGEND**
- NORTH DISTRICT
  - MIDDLE DISTRICT
  - CALVADA DISTRICT
  - SOUTH DISTRICT
  - SUB-DISTRICT BOUNDARIES

**PAHRUMP PROPOSED WATER SERVICE DISTRICT BOUNDARIES**

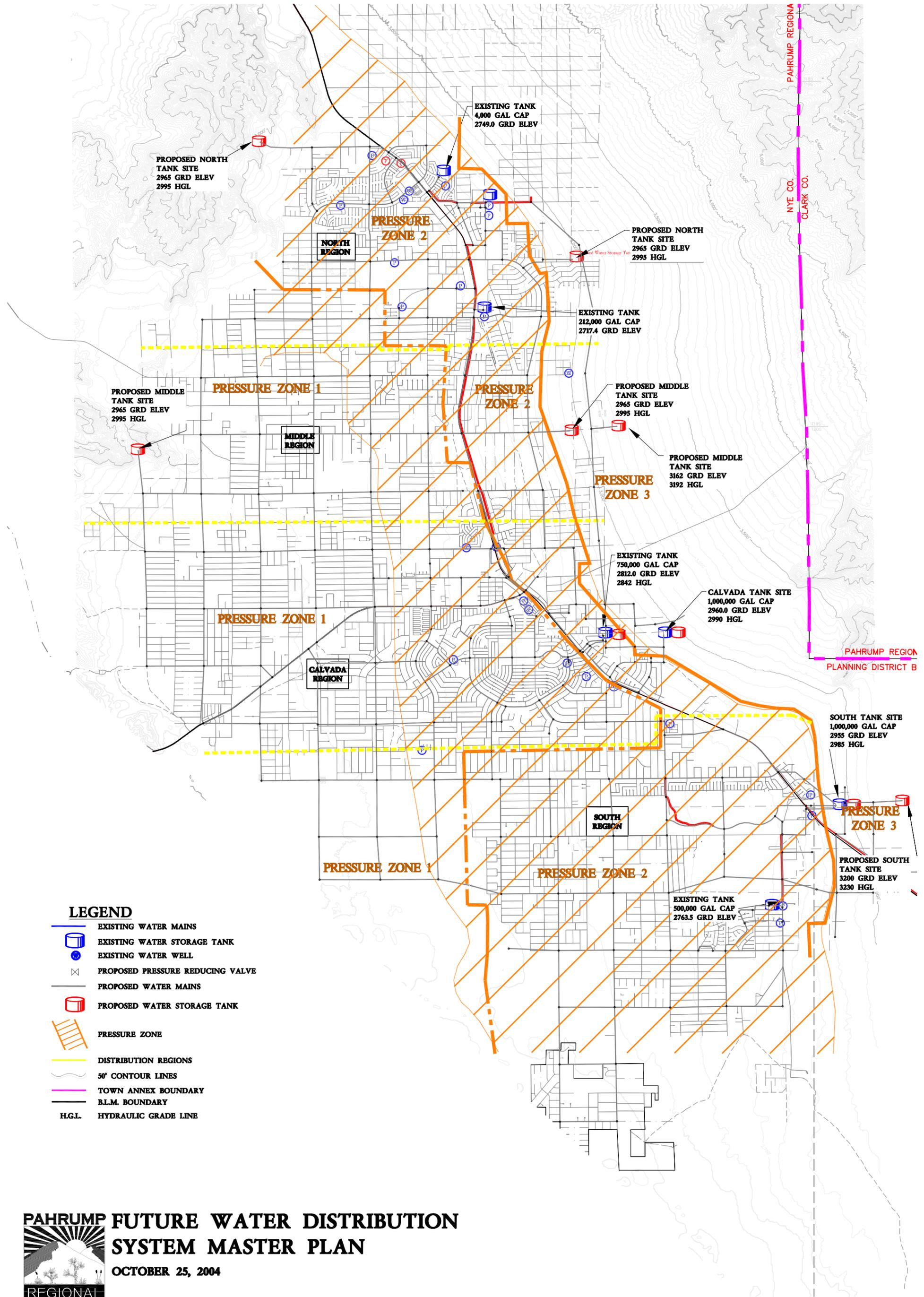
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**ADEQUATE PUBLIC FACILITIES PLAN AND POLICY**  
 NYE COUNTY, NEVADA



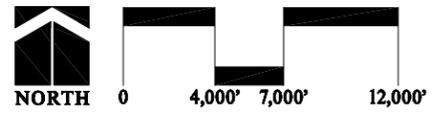
- LEGEND**
- EXISTING WATER MAINS
  - EXISTING WATER STORAGE TANK
  - EXISTING WATER WELL
  - PROPOSED PRESSURE REDUCING VALVE
  - PROPOSED WATER MAINS
  - PROPOSED WATER STORAGE TANK
  - PRESSURE ZONE
  - DISTRIBUTION REGIONS
  - 50' CONTOUR LINES
  - TOWN ANNEX BOUNDARY
  - B.L.M. BOUNDARY
  - H.G.L. HYDRAULIC GRADE LINE

**PAHRUMP FUTURE WATER DISTRIBUTION SYSTEM MASTER PLAN**

OCTOBER 25, 2004



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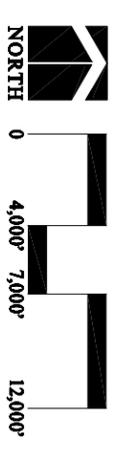
**ADEQUATE PUBLIC FACILITIES PLAN AND POLICY**  
 NYE COUNTY, NEVADA

- LEGEND**
- EXISTING WATER MAINS
  - EXISTING WATER STORAGE TANK
  - EXISTING WATER WELL
  - PROPOSED PRESSURE REDUCING VALVE
  - PROPOSED WATER MAINS
  - PROPOSED WATER STORAGE TANK
  - PROPOSED WATER STORAGE TANK
  - PRESSURE ZONE
  - DISTRIBUTION REGIONS
  - 50' CONTOUR LINES
  - TOWN ANNEX BOUNDARY
  - BLM BOUNDARY
  - HYDRAULIC GRADE LINE

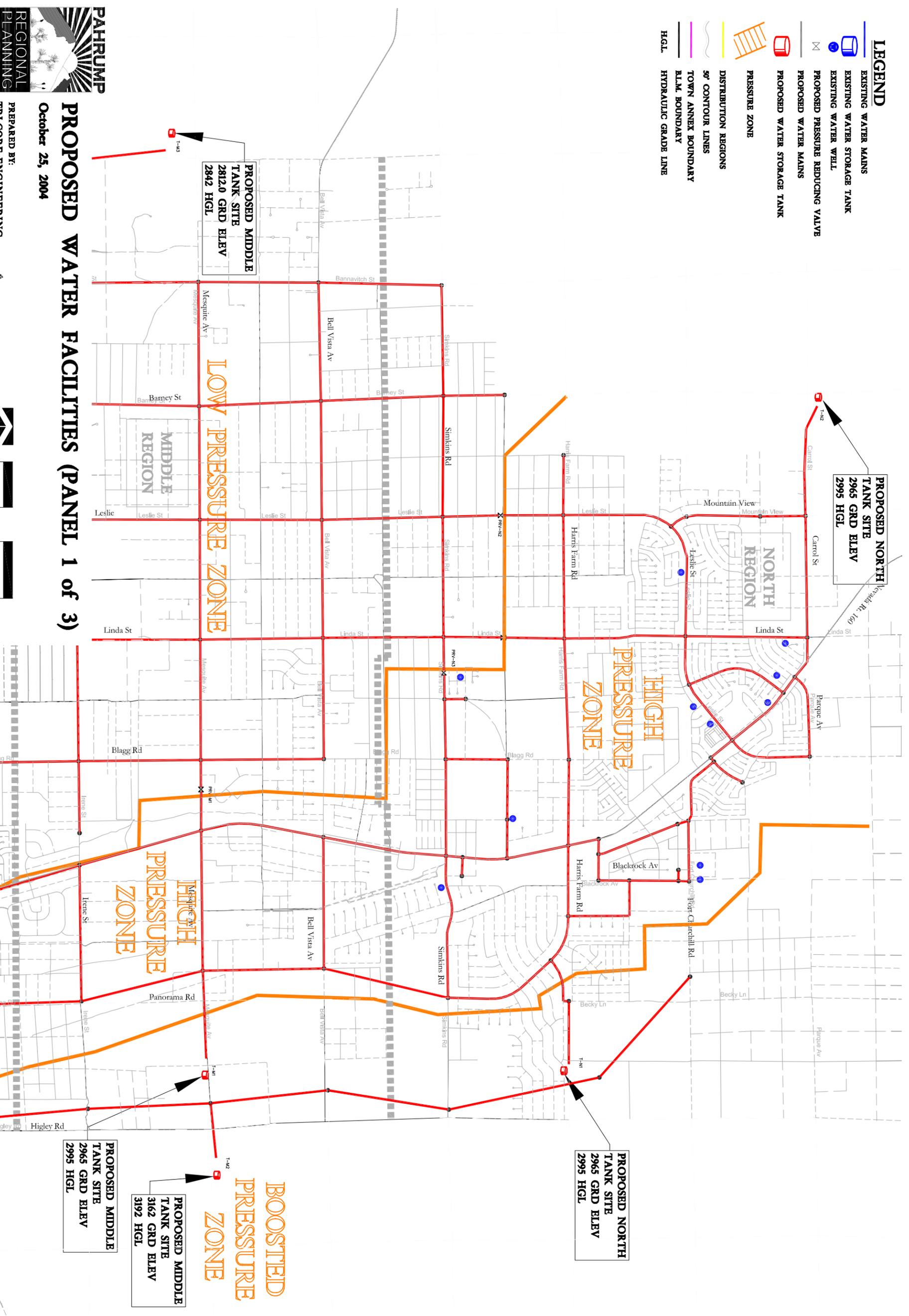


**PROPOSED WATER FACILITIES (PANEL 1 of 3)**  
 October 25, 2004

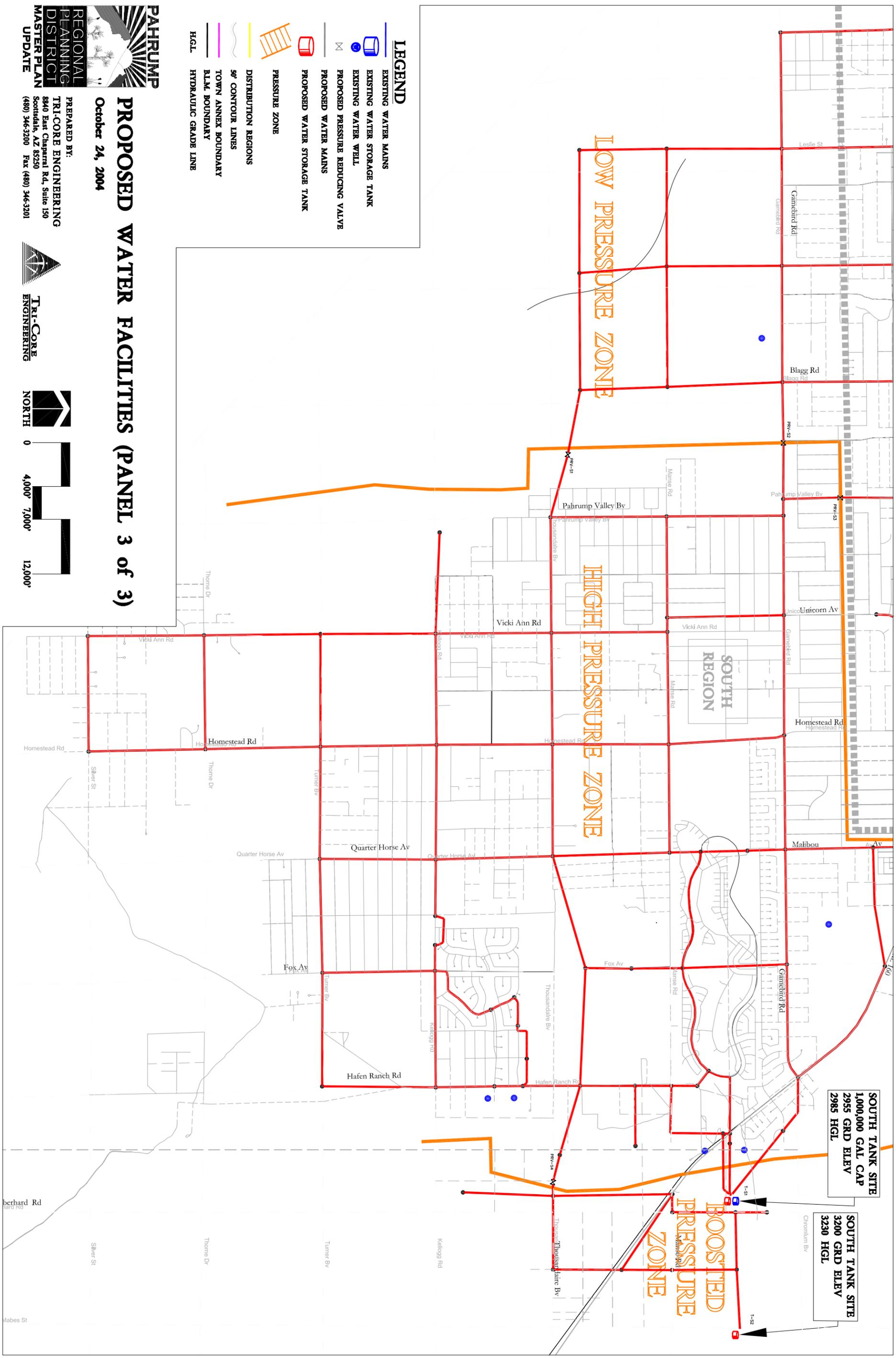
PREPARED BY:  
 TRI-CORE ENGINEERING  
 8940 East Chaparral Rd, Suite 150  
 Scottsdale, AZ 85250  
 (480) 346-3200 Fax (480) 346-3201



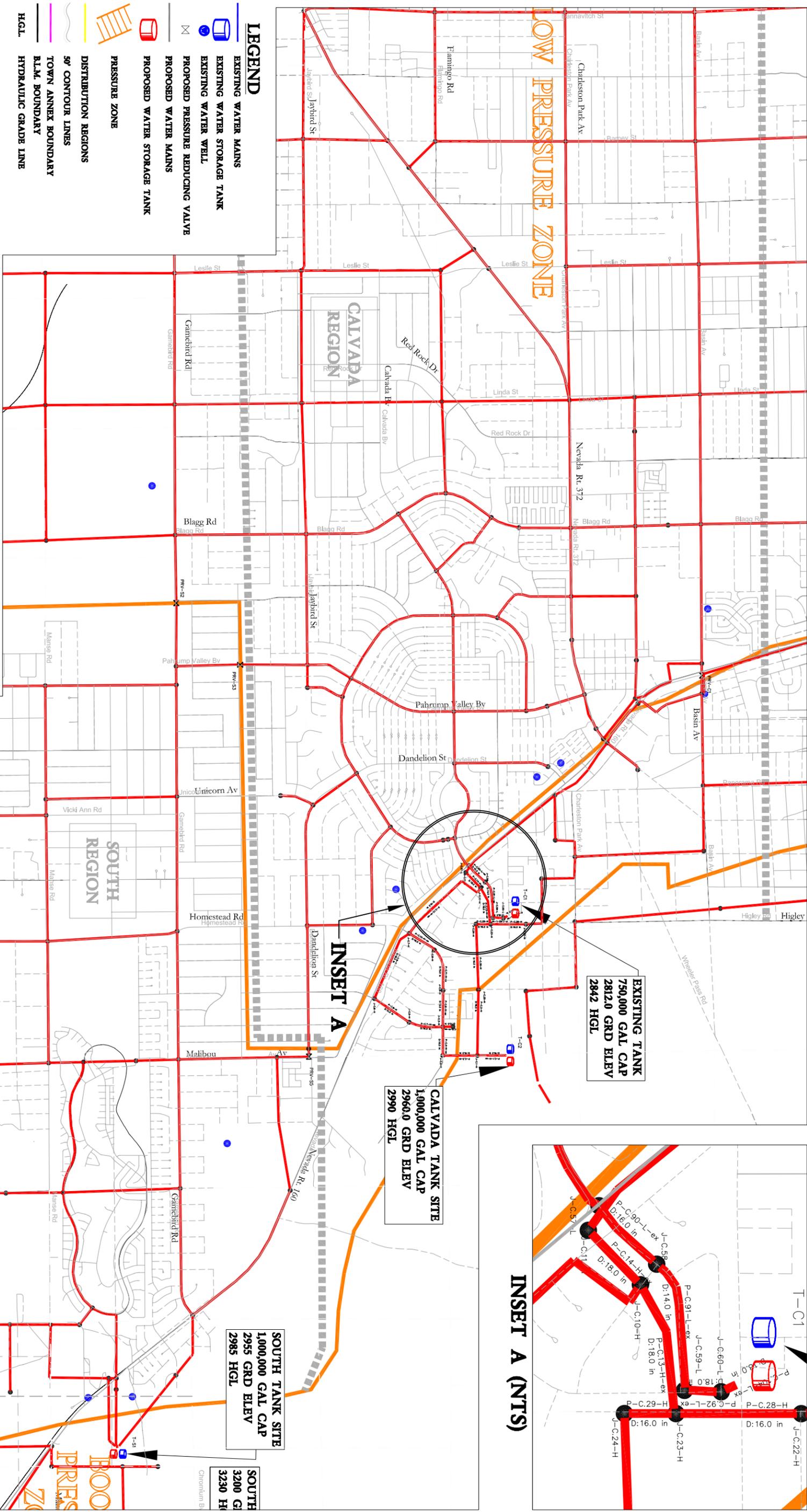
**MATCH LINE (PANEL 2)**



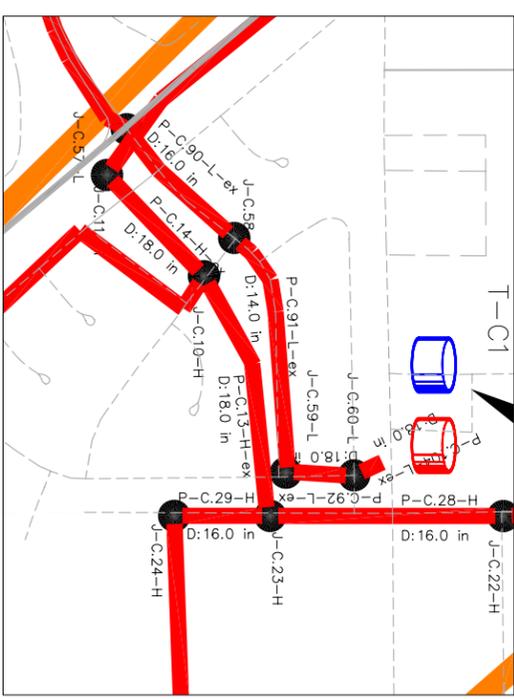
MATCH LINE (PANEL 2)



MATCH LINE (PANEL 1)



INSET A (NTS)



**LEGEND**

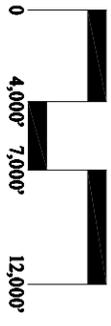
- EXISTING WATER MAINS
- EXISTING WATER STORAGE TANK
- EXISTING WATER WELL
- PROPOSED PRESSURE REDUCING VALVE
- PROPOSED WATER MAINS
- PROPOSED WATER STORAGE TANK
- PRESSURE ZONE
- DISTRIBUTION REGIONS
- 5' CONTOUR LINES
- TOWN ANNEX BOUNDARY
- B.L.M. BOUNDARY
- H.G.L. HYDRAULIC GRADE LINE

**PROPOSED WATER FACILITIES (PANEL 2 of 3)**

October 24, 2004

**PAHRUMP REGIONAL PLANNING DISTRICT MASTER PLAN UPDATE**

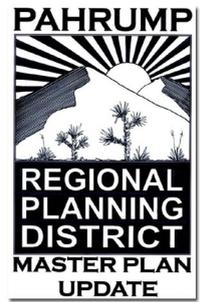
PREPARED BY:  
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MATCH LINE (PANEL 3)

# Pahrump

## Regional Planning District



# Flood Control Plan

August 7<sup>th</sup>, 2006  
5<sup>th</sup> DRAFT



**“Heart of the New Old West”**

# **Storm Water Drainage and Flood Control Plan**

## **FINAL REPORT**

**5<sup>th</sup> Draft**  
August 7<sup>th</sup>, 2006

Prepared For:  
**Nye County, Nevada**

Prepared By:  
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**STORM WATER DRAINAGE AND FLOOD CONTROL PLAN**  
**Pahrump Regional Planning District**  
**Nye County, Nevada**

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## **STORM WATER DRAINAGE AND FLOOD CONTROL PLAN**

### **1.0 INTRODUCTION**

This section of the Adequate Public Facilities Plan contains the Storm Water Drainage and Flood Control Plan for the Pahrump Regional Planning District. As the population of the Planning District increases, it will place a significant burden on local and capital storm water facilities to efficiently and effectively deal with flood control. Nye County has identified the need for flood control water infrastructure in the Planning District to ensure proper sizing and placement of infrastructure and to provide connectivity of the numerous existing storm water drainage areas termed, watersheds.

This Flood Control Plan is intended to provide Nye County with a guide for the existing storm water flows which impact the Pahrump Valley. The development this flood control plan enables county authorities to pin point areas of greatest need that require future planning and design for public safety. The implementation of such a flood control plan is completely dependent upon a strong network drainage facilities complemented by properly sized and strategically located storm water conveyance, retention and detention facilities. A Flood Control Plan based on the most reliable information presently available is necessary to ensure that adequate facilities are provided during the anticipated growth of Pahrump and to allow flexibility for future improvements. Without proper planning, haphazard and piecemeal construction can result in either undersized or oversized facilities. Either condition is very costly to a community since flood control facilities that are too large are not fully utilized, while a storm drain channel that is too small will eventually have to be demolished and reconstructed. The Plan will minimize these problems and will establish continuity in the development of ultimate facilities by serving as a guide for future expansions to existing development and new development.

This report presents a storm water Plan for the Planning District. The plan reports flows from area watersheds and recommends goals, future policies, and typical flood control facilities improvements that could adequately serve the planning area both near-term and projected, as well as the management of those resources. The plan was developed in cooperation with the Nevada Division of Water Planning and the Nevada Division of Water Resources.

The following is a summary of several key issues for the Pahrump Valley Hydrographic Basin.

- Presently, sufficient and reliable control of storm water flows from the large steep mountain ranges are not planned for or adequately accounted for by valley development

- With a projected ultimate population of greater than 150,000, the impact of the land required to maintain continuous control of drainage facilities needs be planned and acquired before cost become prohibitive.
- Existing conditions present a hydraulically challenging area for development. FEMA Flood zones cover the vast majority of developable land within the valley floor and upstream alluvial fans present inconsistent flood paths.
- Very few studies and or reports have been completed analyzing flooding in the planning area, resulting in the absences of continuous regional flood control facilities.

## **2.0 EXISTING HYDROLOGIC CONDITIONS**

Each representative mountain side watershed is affected dramatically by the downstream alluvial fans which split and spread flows before reaching the Pahrump Valley. Alluvial fans typically cause sudden lateral migration as high velocity, sediment-laden watercourses deposit and scour new flow paths. This alluvial flow pattern affects 15 of the 18 watersheds studied in this report. Therefore the flows presented by this report represent both sheet flows, which can spread out across the fan, and concentrated channel flows. State Highway 160, which skirts the bottom of these alluvial fans, intercepts and redirects most small to intermediate flows before they reach the Pahrump Valley bottom. Existing drainage structures along Highway 160 are not large enough, or in significant number to convey even the 25yr, 24hr storm events. Therefore large storm events are assumed to overtop the Highway and are not significantly channeled or diverted. Once these flows pass Highway 160 they proceed slowly across the Pahrump Valley in a southwesterly direction and are affected greatly by street and urban development. Flows eventually exit the Pahrump Valley at the junction of Highway 372 and the Nevada-California state line into a naturally flat dry lake bed. [See Flood Figure #1, Pg 95].

## **3.0 FLOOD CONTROL GOALS, OBJECTIVES, PURPOSES, POLICIES AND IMPLEMENTATION**

**GOAL #1:** Plan for the Protection of Human Health, Property, Water Quality and the Environment through Regional Flood Plain and Storm Water Management.

**Objective-A:** Effective and Integrated Watershed Management.

**Objective-B:** To determine and prioritize Watershed Management needs.

**Objective-C:** Identify future sites for regional flood control structures.

**Objective-D:** Explore and examine flood control needs.

**Objective-E:** Create a variety of policies and criteria to insure the implementation of the goal.

**Objective-F:** Identify existing and potential sources of watershed pollutants, erosion and alternative control.

**Purpose:**

The purpose of a Storm Water Management Plan (SWMP) is to provide a regional plan for the protection of human health, property, water quality and the environment.

**Policy 1:** It is the policy of Nye County to review all development in the valley for storm water compliance with Nevada State storm water regulations.

**Policy 2:** It is the policy of Nye County to establish regional storm water facilities, including the restoration of flood paths as multi-use / park areas.

**Policy 3:** It is the policy of Nye County to implement policies and programs for watershed protection for its hydraulic boundaries, perennial streams, and flooding sources.

**Implementation Action:**

Nye County will explore the necessary steps to develop a regional Storm Water Management Plan. by following the necessary steps listed below:

- Conduct a SWMP
- Record and investigate local surface and subsurface hydrology.
- Utilize GIS to develop a mapping of a inventory all existing hydraulic structures and hydrology.
- Explore with the public, stakeholders, and local agencies appropriate funding mechanism for the development of the SWMP
- Explore and discuss formation of a regional flood control district.

**GOAL #2:** Development and adoption of effective Drainage Guidelines.

**Objective-A:** Integrate watershed management and hydraulic design.

**Objective-B:** Establish regional guidelines for storm water hydraulic criteria and drainage design.

**Objective-C:** Address inconsistencies between local and regional criteria and design standards.

**Objective-D:** Standardize the use of National Oceanic and Atmospheric Administration (NOAA) regional rainfall information.

**Purpose:**

The purpose of a Hydrologic Criteria and Drainage Design Manual is to provide a foundation in which hydrology and hydraulic design is standardized and evaluated.

**Policy 1:** It is the policy of Nye County to develop a Hydrologic Criteria and Drainage Design Manual.

**Policy 2:** It is the policy of Nye County to use design standardization, to the extent practicable, to evaluate existing inconsistencies and deficiencies in both public and private drainage design.

**Implementation Action:**

Nye County will explore the necessary steps to develop a regional Hydrologic Criteria and Drainage Design Manual. By following the necessary steps listed below:

- Evaluate and review other drainage design manuals from other agencies.
- Review recorded and local surface and subsurface hydrology to familiarize the application and implications of drainage design.
- Discuss the creation and implications of regional or local Hydrologic Criteria and Drainage Design Manual.

**GOAL #2:** Construction of effective regional drainage facilities, correct drainage deficiencies, and safely convey storm water from the Spring Mountain watersheds through populated areas.

**Objective-A:** Implement watershed management and hydraulic design.

**Objective-B:** Establish positive drainage flood control structures to protect Human Health, Property, and Water Quality.

**Objective-C:** Preservation of natural drainage ways, riparian habitat, and protection or enhancement of surface and groundwater quality.

**Purpose:**

The purpose of effective regional drainage facilities is to accommodate existing storm water drainage and flooding as it has been and will be affected by human development.

**Policy 1:** It is the policy of Nye County to design and construct regional drainage facilities.

**Policy 2:** It is the policy of Nye County to protect Human Health, Property, and Water Quality through the construction of regional drainage facilities.

**Policy 3:** It is the policy of Nye County to forecast future trends, including water conservation and public need to adequately insure sufficient lead-time is given to the construction of drainage facilities to meet future demands from existing data.

**Implementation Action:**

Nye County will explore the necessary steps to construct regional drainage facilities. By following the necessary steps listed below::

- Utilize GIS records and investigate exiting local surface and subsurface hydrology data to develop future trends and therefore the anticipated demand for regional drainage facilities.
- Evaluate, prioritize and review drainage and flood control needs through out the valley to best establish a Capital Improvement Plan (CIP).
- Propose facilities and infrastructure to coordinate with exiting, proposed, and regional facilities through a SWMP and CIP.
- Explore with the public, stakeholders, and local agencies an appropriate funding mechanism to fund construction of facilities.

## **4.0 SCOPE OF FLOOD CONTROL ANALYSIS**

The elements of a storm water drainage and flood control analysis can be divided into two categories. These categories are:

- Hydrology: Hydrologic and geological conditions
- Hydraulics: Conveyance and Storage Facilities

### **4.1 Hydrology**

## 4.2 Hydraulics

The intention of this report is to identify and discuss general, conceptual flood control improvements that can be applicable to existing conditions. It does not include the detailing and exact location of these improvements. Specific studies such as an Area Drainage Master Plans (ADMP) as mentioned above should be performed to clearly define the type, location, cost and impact of future feasible flood control alternatives.

This plan is organized as follows:

- Flood Control Methodologies
- Existing Watershed
- Proposed Typical Facilities
- Summary and Recommendations
- Mapping

All of the major components are mapped and organized on the maps and figures included in this report. [See Flood Figure #2, Pg 96]

## 5.0 FLOODING CONTROL ANALYSIS METHODOLOGIES

The existing and current urbanization and development in the Pahrump Valley has to date basically ignored on-site and off-site drainage patterns, and consequently has not provided any means to convey storm water runoff therein. As a result there are no sufficient drainage easements, conveyance structures or street sections that can handle significant storm water runoff. Major street or highway drainage structures also have not been designed or constructed to adequately convey runoff, or mitigate flooding. Such is the case on Highway 160, which only has smaller diameter culverts to convey water under the Highway with no downstream easements or defined path to follow. This type of situation can be typical of rapid urban development.

The implementation of adequate flood control facilities for the Pahrump Valley will require a more detailed analysis in the form of a Watershed Plan or Area Master Plan (ADMP). This ADMP would include identification of specific drainage problems, development of feasible alternative solutions, and the preliminary layout of the preferred solutions identified for each area. Since a good deal of development has already occurred with natural drainage patterns being ignored, private land will need to be purchased and dedicated for future drainage facilities. This remedial process will be slow, difficult and expensive through populated areas.

The particular flooding problem that Pahrump Valley faces is related to its position at the foot of a mountain range. The amount of potential off-site storm water generated by over 300 square miles of mountain range is significant and will need to be controlled before development continues to expand. As determined by a 1973 FEMA study, a significant portion (35%) of the Pahrump Valley is mapped as 100-yr flood zone. [See Flood Figure #3, Pg 97]. FEMA zones are updated frequently, so please refer to the FEMA website for up-to-date mapping information.

## **6.0 ANALYSIS DESIGN CRITERIA**

This study was prepared using the United States Army Corps of Engineers' HEC-HMS program version 2.2.2. National Data Elevation Models (DEM 10 and 30 meter), USGS 7.5 Minute topographic quad maps, aerial photography, USGS National hydrology datasets and FEMA flood Insurance Maps. These sources were used to identify the representative tributary watershed areas, water courses, and channel area.

The conservative National SCS Unit Hydrograph Method design criteria were used to calculate watershed runoff. Although general in concept, this method conservatively depicted watershed runoff. NOAA Atlas II point rain depth data was calculated by area weighted averages for each watershed. The Area weighted averages method was used to more accurately portray the dramatic changes in rainfall depth across each representative watershed. Rainfall Depth-Duration-Frequency from Clark County Regional Flood Control District hydrologic criteria and drainage design manual (also NOAA Atlas: Tech Memo Hydro-40, COE) were then applied to the 100yr, 24hr storm depths to account for regional ratio's and basin size reductions. (24hr storm duration was used to conform with SCS methods and FEMA flood plan management criteria. The application of this data was an endeavor to calibrate the national SCS method to this region specific weather patterns. This overall application was conducted without the benefit of actual stream data and or a County Drainage Manual, which would supercede and or provide more area specific data.

## **7.0 EXISTING WATERSHEDS**

Currently there are 18 major watersheds affecting the Pahrump valley. Table 1 below list the major attributes of each of the basins studied by the Plan. Further descriptive detail for each basin including their hydrographs which depict the peak flow rate listed in table 1 can be found in the flood control technical appendix.

**Table 1 - Watershed Peak Flow and Area Summary Table**

Watershed Name	Watershed Area(Sq Miles)	Avg. Reach Slope	Q (100yr 24hr)
Horseshutem East	14.57	14.05%	4,480
Horseshutem West	9.21	4.69%	3,230
Crystal Spring	29.02	10.32%	7,580
Wood Canyon Spring	28.65	8.52%	7,420
Santa Cruz Spring	19.74	9.73%	5,720
Horse Spring	23.28	11.28%	6,300
Wheeler North	18.70	5.67%	2,078
Wheeler Middle	5.27	4.96%	800
Wheeler Wash	92.74	5.10%	18,890
Wheeler South	6.77	7.93%	2,910
Lovers Wash	25.76	9.68%	7,850
Carpenter Canyon	45.74	6.03%	9,790
Bell Vista	12.38	3.10%	4,370
Last Chance	24.05	4.62%	8,060
Sixmile Spring	15.02	6.39%	3,450
Pahrump North	22.49	0.38%	4,440
Pahrump	32.17	0.33%	4,400
Pahrump South	12.08	0.71%	2,510

The following is a brief description of each watershed listed above in Table 1, affecting the Pahrump Regional Planning District. [See Flood Figure #2, Pg 96]

- East Horseshutem is the steepest watershed (14.83 Sq. Mi.); having therefore the fastest time to peak flows. As this northern watershed transitions from the Spring Mountains into three alluvial watercourses, the flows are reduced but have higher velocities. At the watershed bottom along Highway 160 they converge with West Horseshutem flows and continue south toward a natural valley channel. The elevations at the top & bottom of this watershed are 8,695' & 3,050' respectively. It has a reach length of 7.63 miles and an average slope of 14%.

- West Horseshutem is the smallest watershed (9.21 Sq. Mi.) with tributaries reaching into the Last Chance Mountain range. Consequently it has a lower average slope and therefore a somewhat lower water discharge than the other watersheds. This watershed eventually converges running south with the East Horseshutem flows just South of Highway 160. The combined East and West Horseshutem watersheds convey water South into the Crystal Springs watershed area along Highway 160. The elevations at the top & bottom of this watershed are 4,100' & 2,845' respectively. It has a reach length of 5 miles and an average slope of 4.7%.
- Crystal Springs is a medium size watershed (29.02 Sq. Mi.) with a clear southern delineation created by Highway 160. The four definable water courses within this watershed flow separately until eventually combining along Highway 160 to ultimately exit the watershed into the western valley channel nearby the intersection of Leslie St and Highway 160. This channel runs due south through the western side of the valley along the toe of the Last Chance Mountain Range. This channel also conveys both East and West Houseshutem flows through the valley bottom. The convergence of these three watersheds in the channel eventually overtops Highway 160 and creates the shallow flows depicted by the Valley's northern FEMA flood zone. The elevations at the top & bottom of this watershed are 8,040' & 2,775' respectively. It has a reach length of 9.7 miles & an average slope of 10.3%.
- Wood Canyon is slightly smaller than Crystal Springs in size (28.65 Sq. Mi.). This watershed has two major definable watercourses, which split as they travel across the alluvial fans at the bottom of the watershed. Before these flows reach Highway 160, they travel through residential areas. The water paths across State Highway 160 do not converge after flowing into the Town of Pahrump. They continue to spread and contribute to overland sheet flow. The elevations at the top & bottom of this watershed are 7,710' & 2,675' respectively. It has a reach length of 11.2 miles and an average slope of 8.5%.
- Santa Cruz Spring watershed is 19.74 Sq. Mi. in size and contributes to the overland flow in Pahrump after crossing State Highway 160. This watershed has one definable watercourse, but is also affected by small alluvial splits that cross future residential areas before they reach Highway 160. The elevations at the top & bottom of this watershed are 7,380' & 2,675' respectively. It has a reach length of 9.15 miles and an average slope of 9.7%.
- Horse Springs watershed is comparable in size (23.28 Sq. Mi.) to the Santa Cruz watershed and it also contributes to Pahrump's overland sheet flow after crossing Highway 160. The three major watercourses converge and are then distributed across the alluvial fan attributed to this watershed. The elevations at the top &

bottom of this watershed are 9,185' & 2,675' respectively. It has a reach length of 10.9 miles and an average slope of 11.2%.

- Wheeler North watershed (18.7 Sq. Mi.) contains the large northern half of the alluvial fan historically created by Wheeler Wash flows. This area is not affected by the flows of the main Wheeler's watershed. Since Wheeler's flows do not split into this area, the storm water flows observed from this watershed are collected within its boundaries. The one identifiable watercourse eventually is distributed across the alluvial fan above Highway 160. The elevations at the top & bottom of this watershed are 5,575' & 2,625' respectively. It has a reach length of 9.85 miles and an average slope of 5.7%.
- Wheeler Middle is a small watershed (5.3 Sq. Mi.) that is part of the historical alluvial fan deposited by the large flows from the main Wheeler Wash watershed. It is the smallest area of the overall historic fan. Since flows from Wheeler wash also do not split into this area, Wheeler Middle's storm water runoff is conveyed without definable watercourses. The flows are distributed along the alluvial fan and eventually cross Highway 160. The elevations at the top & bottom of this watershed are 4,500' & 2,700' respectively. It has a reach length of 6.87 miles and an average slope of 5%.
- Wheeler Wash is by far the largest and most dramatic watershed affecting the Pahrump Valley. It encompasses an area extending over 92 square miles that converges on a single concentration point before hitting the alluvial fan, and generating the valley's largest flows and FEMA flood plane. These flows are distributed across the large pronounced alluvial fan just Northeast of Highway 160. This watershed changes in elevation from 11,000' at the peak approximately to 2,750' at the Winery Rd area. The landscape changes from pine trees with relative dense forest at the top, to the typical alluvial deposits at the bottom with scarce desert landscaping. Among the most critical areas affected by Wheeler wash, is the Winery Rd. Area which has been constantly exposed to alluvial fan flows that eventually pass through this area and then cross Highway 160. Nye County has been working with the Corps of Engineers to find a solution to this specific flooding problem and as a result, the planning and design of a flood protection structure located on Wheeler wash has been proposed. The reach for this watershed is 19 miles in length, where the top and bottom elevations are respectively 7,875' and 2,750'. It has an average slope of 5.1%.
- Wheeler's Southern alluvial fan is fed by the Wheeler South watershed (6.8 Sq. Mi.) and in large storm event combines with flows from the adjacent Wheeler Wash watershed and occasionally from Lovers Wash watershed. Most of these flows travel through the alluvial area located just North of Highway 160. The Wheeler South flows eventually affect the Pahrump Valley after crossing Highway 160. The elevations at the top & bottom of this watershed are 5,085' &

2,790' respectively. It has a reach length of 5.5 miles and an average slope of 7.9%.

- Lover's Wash is 26 Sq. Mi. in size and discharges flow to Highway 160. This watercourse combines and distributes with the northern boundary of Carpenter Canyon's alluvial fan. The Lover's wash flows are comparable in size with the Wood Canyon Spring flows. The elevations at the top & bottom of this watershed are 9,350' & 2,800' respectively. It has a reach length of 12.8 miles and an average slope of 9.7%.
- Carpenter Canyon is the second largest watershed and is adjacent in the upper reaches to the Wheeler basin. It is comprised of almost 46 Sq. Mi. of steep mountainous terrain. There are three watercourses that eventually converge and distribute across the large alluvial fan North of Highway 160. The storm water runoff created by this watershed affects the most southern section of the Valley. The flows primarily run south to the Pahrump Valley's central dry lake bed (Mound Spring), which is located south of town and just across the California State line. However, storm water sheet flows resulting from large storm events on this watershed can possibly combine with floodwaters from the larger Wheeler wash area. This can occur after Carpenter Canyon flows pass through the Southern populated areas of the Pahrump valley. The flows from this watershed define the last large southern FEMA flood zone. The elevations at the top & bottom of this watershed are 8,200' & 2,870' respectively. It has a reach length of 16.7 miles and an average slope of 6%.
- Bell Vista is a smaller watershed (12.4 Sq. Mi.) that has a single concentration point for the entire watershed. The storm water runoff collects and combines with the Last Chance watershed flows heading south to the valley's ultimate outfall. This watershed is not directly affected by alluvial fans. FEMA has also attributed a flooding area to this watershed. The elevations at the top & bottom of this watershed are 3,600' & 2,657' respectively. It has a reach length of 5.8 miles and an average slope of 3.1%.
- Last Chance is a large watershed (24 Sq. Mi.) which includes the northern portion of the Pahrump Valley and the eastern side of the abrupt Last Chance Range. This mountain Range is located to the West of Pahrump and contributes numerous small watercourses, which combine in the valley's major shallow channel. This channel is the same channel that conveys the flow from East and West Horsesutem and Crystal Springs Watersheds. These combined shallow channel flows run south along the western side of the valley. The overall watershed for the most part is affected by existing urban development. The shallow flow ultimately runs through town and finally south into the Sixmile Spring watershed area. The Last Chance watershed is not affected by alluvial fans. The

elevations at the top & bottom of this watershed are 4,200' & 2,560' respectively. It has a reach length of 6.7 miles and an average slope of 4.6%.

- Sixmile Spring (15 Sq. Mi.) is a watershed located just south of the Bell Vista watershed, that contains numerous small watercourses. These small watercourses start at the southern end of the Last Chance Mountain range and the Devils Hole Hills and run into the valley's major shallow channel (previously discussed) which runs south along the western side of the valley. The mixing of the smaller Sixmile Spring watershed flow in this shallow channel with the other contributing flows (previously discussed) eventually cross State Highway 372. This runoff continues to flow south around the southern tip of Devils Hole Hills to cross the state line and then turns North again to the valley's ultimate outfall (Stewart Dry Lake Bed). This watershed is not affected by major alluvial fans. The elevations at the top & bottom of this watershed are 4,000' & 2,525' respectively. It has a reach length of 4.4 miles & an average slope of 6.4%.
- In addition to the 15 watersheds previously mentioned and because of the flat uniformity of the area, the Pahrump central area is divided into three basins: Pahrump North, Pahrump, and Pahrump south. Pahrump North has a total contributing area of 22.5 Sq. Mi., elevations at the top & bottom of 2,660' and 2,475'; a reach length of 8.83 miles and a slope of 0.38%; Pahrump basin has a total contributing area of 32.17 Sq. Mi., elevations at the top & bottom of 2,700' and 2,500'; a reach length of 11.44 miles and a slope of 0.33%. Finally Pahrump South has a total contributing area of 12.08 Sq. Mi., elevations at the top & bottom of 2,950' and 2,525'. It has a reach length of 11.31 miles and an average slope of 0.71%. The main flow characteristic in each basin is shallow sheet flows that eventually travel south to the natural Stewart Dry Lake bed on the Nevada California state line.

## 8.0 PROPOSED FACILITIES

Typical flood control facilities that could be applicable for the Pahrump valley are:

- Dikes or dams applied prior to the alluvial fan spread.
- Collector channels perpendicular to the runoff flow (e.g. along Highway 160) leading to detention or retention basins, or larger channels or underground box culverts or pipes conveying the flow through populated areas.
- Berms or dikes perpendicular to the runoff flow (e.g. along Highway 160) directing flow to detention or retention basins or larger channels or underground box culverts or pipes conveying the flow through town.
- A series of detention basins located along logical routing corridors connected by channels or underground box culverts or pipes conveying the flow from basin to basin and eventually through Town.

- Various integration's of the above mentioned facilities combined to tailor fit each watershed and associated feasible routing corridors.

The overall solution for most of the watersheds will likely consist of a series of dikes or interceptor channels to capture flows coming from the mountains and across the alluvial, and then conveying them to retention/detention basins, with the purpose of concentrating, storing, and eliminating, or reducing the outflow, complemented with a system of pipes and channels to convey the reduced flows through the city within major arterial streets right-of-ways and/or dedicated drainage easements.

In flood prone areas, the construction of storm water drainage (flood control) facilities are essential for public safety and protection of property. Where damaging storm water flows are largely generated outside the area of development the construction of large scale flood control facilities are advantageous. Storm drain collection facilities constructed throughout the community along with onsite retention requirements for new development will mitigate the damaging effects of storm water flows within the developed areas.

### **8.1 Ground Water Recharge**

Diversion and storage of storm water flows provides the opportunity (although somewhat limited) to enhance groundwater recharge resulting in an increased amount of groundwater available for future beneficial use. Groundwater recharge occurs when precipitation infiltrates through the soil to become part of the groundwater flow system (Anderson, 1992). Implementing the design goal of maximizing groundwater recharge during the planning and construction of the retention/detention basins associated with the flood control facilities will enhance the security of future water supplies from groundwater. It is anticipated that including recharge as a design goal will be cost effective since the requirements to enhance recharge are relatively straight forward and typically involve minor changes to the configuration and operations of the diversion and storage facilities to maximize infiltration. Drainage corridors would be included in an ADMP and these corridors could include ground water recharge areas.

## **9.0 COST ANALYSIS**

Providing a cost for the flood control system is not a part of the scope of this project, This information is best provided during the preparation of the Capital Improvements Plan (CIP).

## **10.0 SUMMARY AND RECOMMENDATIONS**

The Hydrology analysis presented here follows national and adjacent Clark County analysis methods, and these methods are in conformance with FEMA flood

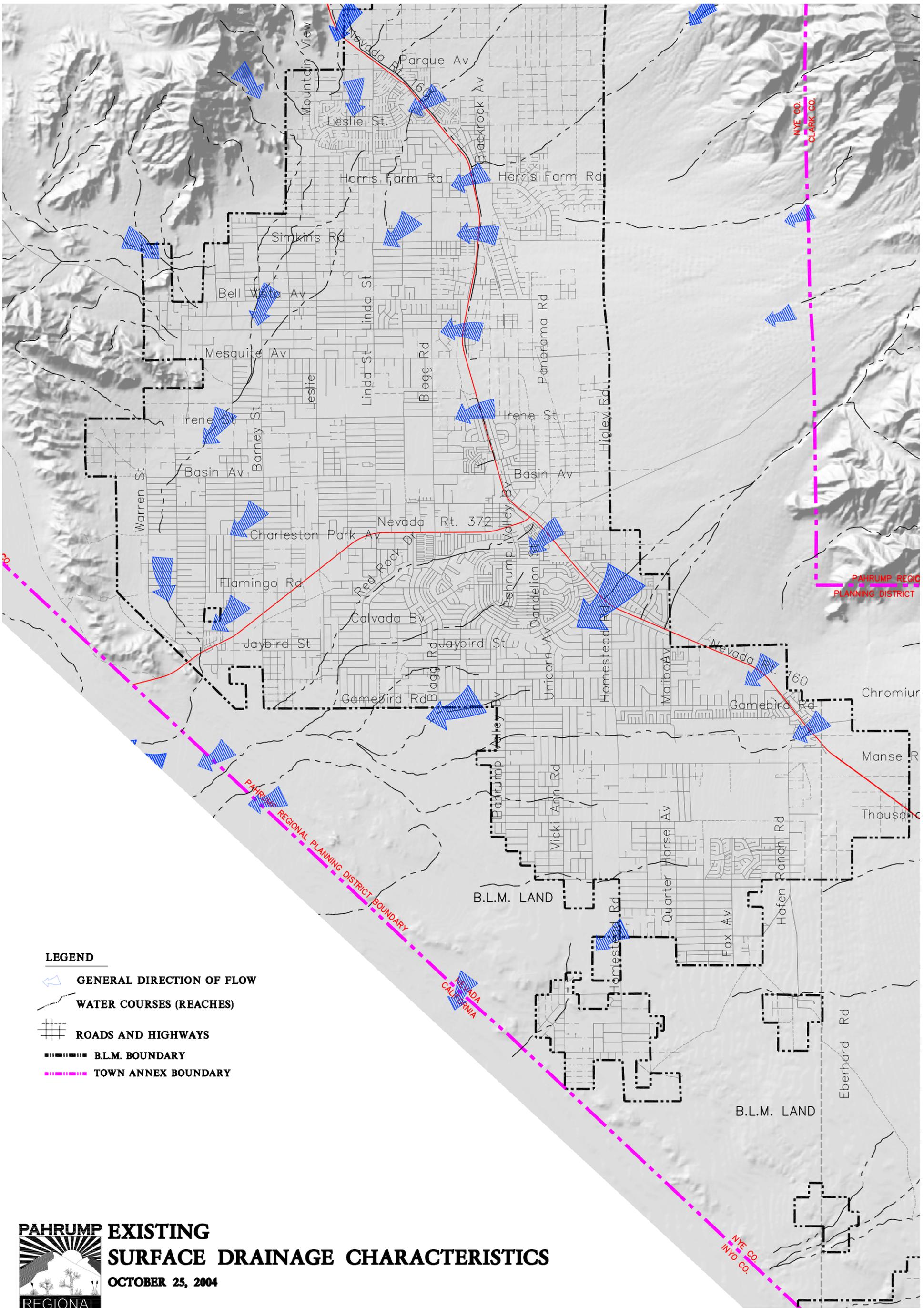
management requirements. The lack of local rain/flow measurements makes it somewhat difficult to determine locally accurate rainfall intensities. It would be very advantageous to install weather stations and water stream gauges at favorable locations within logically selected watersheds. The automatic weather stations would be compact and economic with sensors to measure wind, pressure, temperature, relative humidity and most importantly precipitation data. Information obtained from these stations will be extremely valuable, not only for storm management purposes but also for different applications such as airport design. As a proposed start to implementing these items, the location of five low cost automatic compact weather stations and a water stream gauge has been proposed. [See Flood Figure #2, Pg 96]

As previously discussed an Area Drainage Master Plan (ADMP) is imperative to fully address the significant regional drainage problems that exist in the Pahrump Valley. The ADMP is needed to identify drainage problems and then develop cost-effective solutions.

The findings and results of the ADMP will be analyzed by both consultant and county staff to determine the level of protection desired. Cost estimates of the preferred alternatives calculated for the desired storm event (level of protection) would then be used to determine the future capital improvement costs associated with implementing the preferred facilities.

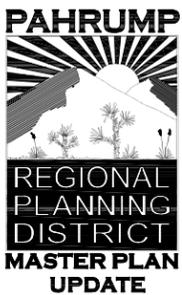
### **10.1 References and Examples**

- Clark County Regional Flood Control District (1999), Hydrologic Criteria and Drainage Design Manual, Las Vegas, NV.
- National Weather Service (1973), Precipitation-Frequency Atlas of the Western United States, NOAA Atlas 2, Silver Spring, MD.
- Nye County Water Resource Plan (2000), Thomas Buqo, Consulting Hydrologist,
- USACE (1993), Flood-Runoff Analysis, EM 1110-2-1417 Office of Chief Engineers, Washington, DC.
- Hydrologic Modeling System HEC-HMS Technical Reference Manual, March 2000, US Army corps of Engineers.
- Anderson (1992), Geo-hydrology and Water Resources of Alluvial Basins in South Central Arizona and Parts of Adjacent States, US. Geological Survey Professional Paper 1406-b



**LEGEND**

-  GENERAL DIRECTION OF FLOW
-  WATER COURSES (REACHES)
-  ROADS AND HIGHWAYS
-  B.L.M. BOUNDARY
-  TOWN ANNEX BOUNDARY



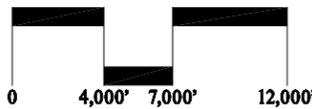
**PAHRUMP EXISTING SURFACE DRAINAGE CHARACTERISTICS**

OCTOBER 25, 2004

PREPARED BY:  
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 Scottsdale, AZ 85250  
 (480) 346-3200 Fax (480) 346-3201

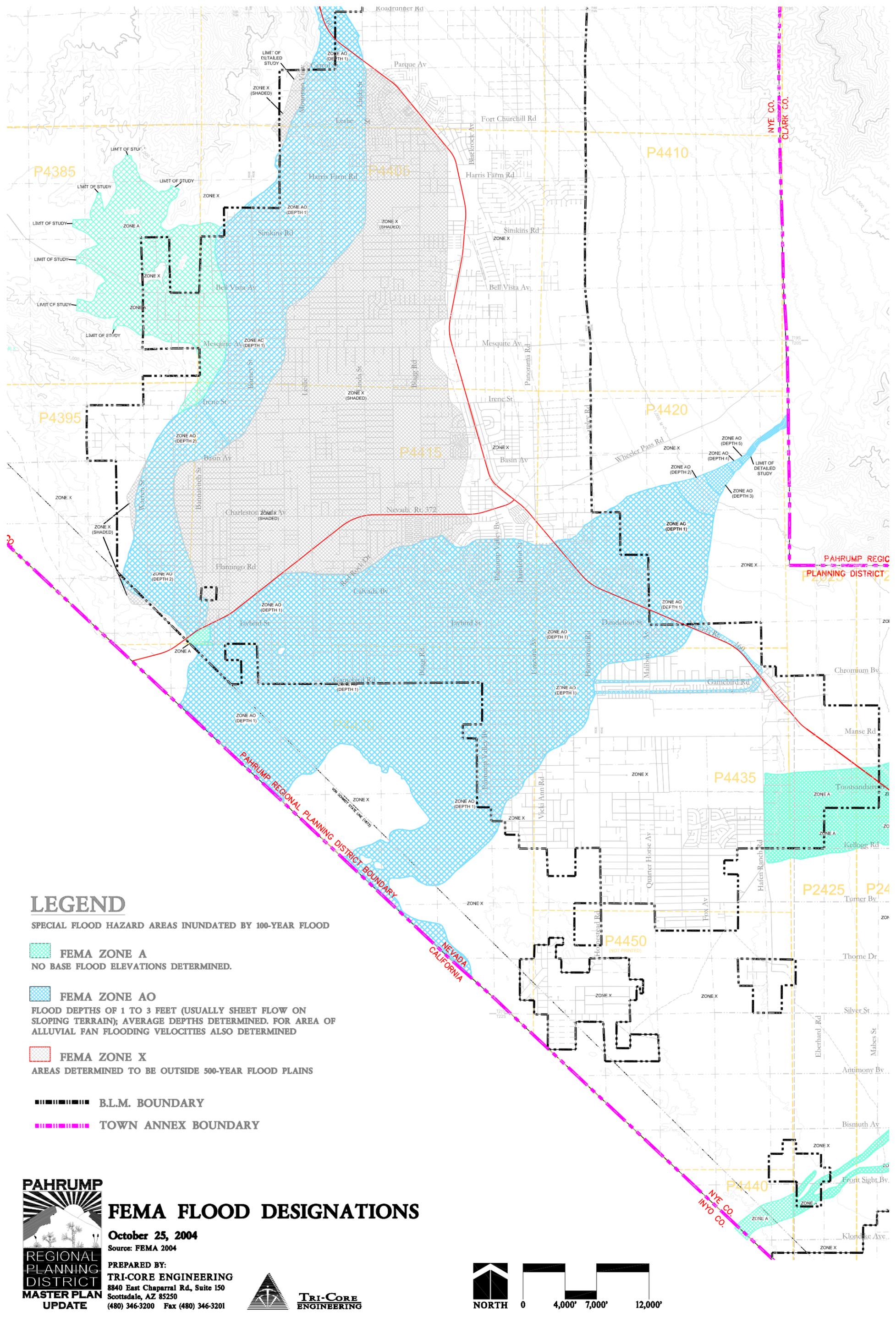


**TRI-CORE ENGINEERING**



**ADEQUATE PUBLIC FACILITIES PLAN AND POLICY**  
**NYE COUNTY, NEVADA**



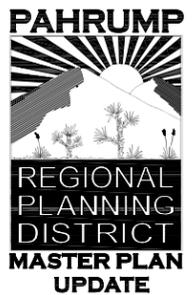


# LEGEND

SPECIAL FLOOD HAZARD AREAS INUNDATED BY 100-YEAR FLOOD

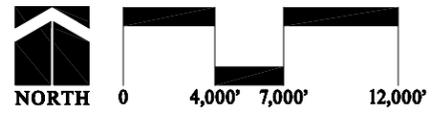
- FEMA ZONE A**  
NO BASE FLOOD ELEVATIONS DETERMINED.
- FEMA ZONE AO**  
FLOOD DEPTHS OF 1 TO 3 FEET (USUALLY SHEET FLOW ON SLOPING TERRAIN); AVERAGE DEPTHS DETERMINED. FOR AREA OF ALLUVIAL FAN FLOODING VELOCITIES ALSO DETERMINED
- FEMA ZONE X**  
AREAS DETERMINED TO BE OUTSIDE 500-YEAR FLOOD PLAINS

- B.L.M. BOUNDARY**
- TOWN ANNEX BOUNDARY**



## FEMA FLOOD DESIGNATIONS

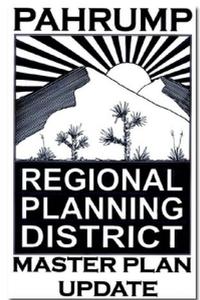
**October 25, 2004**  
 Source: FEMA 2004  
 PREPARED BY:  
**TRI-CORE ENGINEERING**  
 8840 East Chaparral Rd., Suite 150  
 Scottsdale, AZ 85250  
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# ADEQUATE PUBLIC FACILITIES PLAN AND POLICY NYE COUNTY, NEVADA

# Pahrump

## Regional Planning District



# Adequate Public Facilities Policy

August 7th, 2006  
5th DRAFT



**“Heart of the New Old West”**

# **Adequate Public Facilities Policy**

## **FINAL REPORT**

**5<sup>th</sup> Draft**  
August 7<sup>th</sup>, 2006

Prepared For:  
**Nye County, Nevada**

Prepared By:  
**Tri-Core Engineering**  
**8840 E. Chaparral Road**  
**Scottsdale, AZ 85250**  
**(480) 346-3200**

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**ADEQUATE PUBLIC FACILITIES POLICY  
Pahrump Regional Planning District  
Nye County, Nevada**

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## **ADEQUATE PUBLIC FACILITIES POLICY**

### **1.0 INTRODUCTION**

The purpose of this Policy is to ensure that adequate public facilities, which include roads, parks, sewer, water, drainage, police and fire services, are provided at or about the point in time when new development occurs.

### **2.0 GENERAL**

This Policy shall be known and cited as the Adequate Public Facilities Policy (APFP) for the Pahrump Regional Planning District of Nye County, Nevada.

This Policy is adopted with the intent that new development and construction takes place in accordance with the Pahrump Regional Planning District Master Plan in order to ensure that adequate public facilities (APF) and services are available concurrently with the completion of proposed new development so that growth occurs in an orderly and sustainable manner. It is the intention of this APFG that provision of adequate facilities will be done in cooperation and coordination between Nye County, the Pahrump Town Board, and public or private utilities that provide service to the Pahrump Valley.

### **3.0 DEFINITIONS**

For the purpose of this Policy, the following terms, words and phrases shall have the meanings given herein. The words “shall” and “will” are always mandatory and not discretionary. The word “may” is permissive. Words used in the present tense include the future; and words used in the singular include the plural; and the plural includes the singular; words of the masculine gender will include the feminine and the neuter gender will refer to any gender as required, unless the context plainly indicates the contrary. The words “used for” shall include “arranged for”, “designed for”, “intended for”, “maintained for”, “constructed for”, or “occupied for”. The word “individual” shall mean natural person, joint venture, joint stock company, partnership, association, club, company corporation, business trust or the manager, lessee, agent, servant, officer or employee of an of them. A building or structure includes any part thereof. Unless it is plainly evident from the context that a different meaning is intended, a regulation which involves two or more items, conditions, provision, or events connected by the conjunction “and, or” or “either...or” shall be defined as follows: “and” means that all the connected items, conditions, provisions and events apply together and not separately; “Or” means that the connected items, conditions provision or events apply separately or in any combination; “either...or” means that the connected items, conditions, provisions, or events shall apply separately but not in combination. The word “includes” does not

limit a term to the specified examples but is intended to extend the term's meaning to all other instances or circumstances of like character or kind.

**3.1 Adequate Public Facilities**

Those public facilities or services as described in this Policy which meet established minimum standards specified herein.

**3.2 Adequate Public Facilities Report Submittal**

Submittals made by individuals or developers to Nye County for adequate public facilities approval.

**3.3 Approval**

Submittals made by individuals or developers to Nye County shall be evaluated by County staff. If the submittal meets or exceeds the criteria specified herein, the reviewing agency shall sanction the submittal.

**3.4 BOCC**

Board of County Commissioners, of Nye County, Nevada.

**3.5 Capital Improvement Plan (CIP)**

An annual document adopted by the County identifying County capital projects having funding approval for the current fiscal year as well as all capital projects planned for the following five (5) year period, including proposed means of financing.

**3.6 County**

Nye County, Nevada

**3.7 County Engineer**

The duly designated Engineer of Nye County or if no Engineer is designated then the Public Works Director or the chief County officer in charge of the public works business unit.

**3.8 Developer**

An individual, partnership, corporation (or agent thereof), or other entity that undertakes responsibility for any or all of the development activities covered by this document, particularly the designing of a subdivision plat or site development plan showing the layout of the land and the public improvements involved therein. In as much as the subdivision plat is merely a necessary means to the end of assuring a satisfactory development, the term

“developer” is intended to include the term “subdivider”, even though the personnel involved in successive stages of the project may differ.

### **3.9 Development**

The area of land which is subject to change in use (preliminary plan or site plan approval) or expansion of existing use and which is subject to subdivision or site plan review.

### **3.10 Development Agreement**

A contract, between the developer and the County to complete necessary improvements in accordance with the approved plans and specifications.

### **3.11 Final Plat**

The final map, drawing or chart upon which the subdivider’s plan of subdivision as approved by the BOCC, if approved, will be submitted for recording in the Land Records of Nye County.

### **3.12 Gross Lot Area**

Gross lot area is calculated by extending property lines to the centerline of adjacent streets, roads, and/or drives.

### **3.13 Lot**

A contiguous area of land separated from other areas of land by separate description (including a recorded deed, a subdivision plat or record of survey map, or by metes and bounds) for purpose of sale, lease, transfer of ownership or separate use.

### **3.14 Major Subdivision**

Any parcel, which has been or is proposed to be subdivided to create more than four (4) lots.

### **3.15 Master Plan(s)**

Also know as the Pahrump Regional Planning District Master Plan. This includes additional approved Master Plans of Streets and Highways, Sewer, Water, Stormwater and Drainage. A composite of mapped and written text, the purpose of which is to guide the physical development of the County and is adopted by the Nye County Board of County Commissioners (BOCC) and includes all changes and additions thereto made under the provisions of the Nevada Revised Statutes (NRS).

**3.16 Minor Subdivision**

Any parcel which has been or is proposed to be subdivided to create four (4) or fewer lots.

**3.17 Off-site Runoff**

Runoff produced from precipitation which falls outside the limits of a development and which drains through a development or the site of proposed development.

**3.18 On-site Runoff**

Runoff produced from precipitation which falls within the limits of a development including easements and dedicated rights-of-way.

**3.19 Mixed Use Development**

The Mixed Use Development as defined in Pahrump Regional Planning District Master Plan.

**3.20 Parks and Open Space**

This is land outside of public right-of-ways use for the purpose of active and passive recreation. It may include parks, trails systems, ball fields, playgrounds, etc. Flood Control retention/detention facilities can be incorporated into parks and open space if they include amenities as specified by the Planning Director.

**3.21 Planned Unit Development**

A zoning district approved by the County, which allows a variety of uses and dwelling unit types in accordance with the approved zoning ordinance.

**3.22 Planning Department**

A department within county government that performs the administrative function for the RPC and other functions as directed by the BOCC.

**3.23 Plat**

A map, plan, chart or drawing indicating the subdivision or resubdivision of land filed or intended to be filed for the record.

**3.24 Rainfall Event**

The amount of rain falling in a specified period of time.

### **3.25 Retention System**

A system which retains runoff in a controlled manner through the use of storage facilities. Stored runoff is either evacuated by percolation or released to the downstream drainage system after the storm event.

### **3.26 Right-of-Way**

A land area designated, dedicated, or reserved for use as a highway, street, alley, interior walk, or for a drainage channel, sanitary sewer works, or other public use, which may or may not include any utility easements.

### **3.27 Roads**

Public rights-of-way recognized and maintained by the state, county or town including, but not limited to, pavement, drainage, traffic control devices, bridges, and culverts and may include utility easements or other public transportation corridors.

### **3.28 RPC**

Regional Planning Commission, of the Pahrump Regional Planning District established in Nye County by NRS 278.

### **3.29 Service and Pre-Service Agreements**

An agreement allowing the developer to start grading and putting underground services at it's own risk as soon as the engineering drawings have been approved, without waiting for clearances of other conditions that the developer has to satisfy before the plan can be filed.

### **3.30 Site Plan**

The plan indicating the location and elevation of existing and proposed buildings, structures, paved areas, surface drainage, walkways, vegetative cover, landscaping and screening within a site proposed for development which is to be submitted and approved prior to the release of building permits on the site. A drawing that shows all of the existing conditions of a specified area (the site) and all of the improvements and changes proposed to be made on the site. A site plan is the drawing required by the Zoning Ordinance for all new development and certain additions and must contain all applicable information as specified in the Zoning Ordinance.

### **3.31 Subdivision**

The division of a lot, tract or parcel of land into two (2) or more lots, parcels, sites or other divisions of land for the purpose, whether immediate or future, of transfer of ownership or building development. It includes resubdivision and

when appropriate to the context, relates to the process of resubdividing or to the land or territory subdivided.

**3.32 Tentative Map**

The preliminary drawings or draft plans and supplementary materials indicating the proposed layout of the subdivision to be submitted to the County for its consideration.

**3.33 Town**

Town of Pahrump

**3.34 Utility Easement**

An easement for utilities. Both public and private utilities can be located in a utility easement. Actual location of utilities within the public right-of-way is to be determined by the Public Works Director.

**3.35 Zoning Ordinance**

The approved Pahrump Regional Planning District Zoning Ordinance, and all subsequent additions or amendments thereto.

**4.0 ADMINISTRATION**

**4.1 Authority**

This Policy is established in accordance with the applicable provisions of NRS 278.

**4.2 Jurisdiction**

The provisions of this Policy shall apply only to the Pahrump Regional Planning District in Nye County, Nevada

**4.3 Administration of Policy**

This Policy shall be administered by the Nye County Board of County Commissioners (BOCC). All applications, maps, and documents relative to subdivision or site plan approval coming under the provisions of this Policy shall be submitted to Planning Department for review.

The BOCC may not approve new development unless there exists adequate public facilities that are required by this statute or the developer agrees to construct necessary improvements for the purpose of complying with this Policy. A developer shall not avoid the intent of this Policy by submitting

piecemeal applications for a subdivision or site plan. However a developer may seek approval of phases of the subdivision or development, provided that the impact from all previously approved subdivision or site plans from that development shall be considered during the review of each subsequent phases of the development. Nothing in this Policy shall prevent the BOCC from approving phases of subdivisions or site plans of new development if the portions of the subdivision or site plan comply with the provisions of this Policy.

#### **4.4 General Requirements**

The intent of this Policy is that new development takes place in accordance with the Pahrump Regional Planning District Master Plan in order to ensure that adequate public facilities and services are available concurrently with the completion of proposed new development so that growth occurs in an orderly and sustainable manner. It is further the intent of this Policy that provisions of adequate public facilities will take place in cooperation between the County, the Town, and other public and private entities that provide the facilities and services affected by the proposed development. For the purpose of this Policy, public facilities and services shall include road and traffic, parks and recreation, sewage, water, sheriff and fire services, drainage and schools.

Subdivision plans or site plans that do not meet the requirements for adequate public facilities shall not be granted subdivision or site plan approval. A conditional approval may be granted provided no final approval shall be granted or lots recorded until the conditions set forth in the conditional approval have been met.

Approval of Adequate Public Facilities (APF) as set forth in this Policy shall be valid from the date of the meeting at which approval of the subdivision or site plan is granted as long as the approval remains valid.

If a developer is seeking concurrent tentative map, and site plan or final map approval, the Adequate Public Facilities Certificates shall be required as part of the preliminary plan approval. Notes shall be placed on both documents specifying approved use(s).

#### **4.5 Adequate Public Facilities (APF)**

No subdivision plan, site plan, land use plan for a PUD, conditional use or zone change may be approved unless on the date of such approval there exists Adequate Public Facilities (APF) applicable to the project for which such approval is sought.

#### **4.6 Submittal Requirements**

Developers shall make APF submittals containing the following information:

- a. Background information that describes the proposed development, its location, and the adequacy and conditions of all surrounding public facilities.
- b. Identification and analysis of development impacts to public facilities in accordance with this Policy.
- c. Proposed program for mitigating impacts to public facilities.
- d. A submittal must address the impacts of each phase of project development and must submit a schedule for each phase of construction.

#### **4.7 Escrow Funds for Public Facilities**

In lieu of either providing the public facility improvements or waiting for public facilities to become adequate, the developer shall have the option of contributing money to an escrow account as set forth in this section provided it is determined that the developer has fulfilled each of the requirements of this section.

The amount of money the developer shall be required to place in the escrow account shall be the proportionate share of costs of making the improvements required to satisfy the adequacy requirements. The amount of such escrow shall be roughly proportionate to the anticipated impact of the proposed development.

The applicant shall provide information to make this equitable allocation. Planning Department and Department of Public Works staffs shall review this information provided by the applicant and recommend an equitable allocation. Once an improvement is approved and an escrow account is established subsequent applicants shall contribute to the escrow fund an equitable allocation of the public facility improvement.

Any approval of an escrow request shall be based upon sufficient information and facts that determine if it would not be equitable to impose the entire cost of the required improvements on the developer because of the limited impact that the proposed development would have and that the development would not have a substantial adverse impact on community facilities.

#### **4.8 Reimbursement**

When a developer is required to build more than his proportional share of a facility he shall be eligible for a recapture agreement for the excess. The County and developer may enter into a Recapture Agreement for not greater than ten (10) years.

#### **4.9 Concurrency**

Needed capital facilities must be installed and available for use at the time of development, or within a reasonable time period following completion of the development. Provision of capital facilities at locally adopted Level of Service (LOS) standards must be made, or committed to, before the new development can be approved.

To meet concurrency requirements the following steps must be met:

- a. Identify the facilities and services to be included in the system.
- b. Set a Level of Service standard for each facility type (this is being done as part of the Development Impact Fees program).
- c. Develop a procedure for monitoring or accounting for the LOS of each facility.
- d. Determine procedures and requirements for reserving capacity and establishing vested rights.

(Because Level of Service issues have not yet been determined, and will not be determined until after successful implementation of the Capital Improvement Plan and Impact Fees program, the capacity and funded improvements portions of concurrency are impossible to define at this time.)

Any one of the following standards shall meet the concurrency requirements:

- a. The necessary facilities and services are in place at the time a final development order is issued.
- b. A final development order is issued subject to the condition that the necessary facilities and services will be in place when the impacts of development occur.
- c. The necessary facilities are under construction and bonded for completion at the time a final development order is issued.
- d. The necessary facilities and services are guaranteed in an enforceable development agreement, which guarantee is secured by a completion bond, letter of credit, or other security acceptable to the County Attorney and the Public Works Director. The agreement must guarantee that the necessary facilities and services will be in place when the impacts of the development occur.

#### **4.10 Exemptions**

A single family home on a single lot that is not being subdivided is exempt from the requirements and procedures of this APFG. In relieving the homebuilder of a single house of the requirement of this Policy, it should not be construed that the homebuilder is relieved from impact fees or other fees that may be imposed prior to issuance of a building permit. The County reserves the right to impose impact fees and/or other fees on any and all development without a need to amend this Policy.

#### **4.11 Appeals**

Any person aggrieved by any recommendation of County officials accepted or rejected by the RPC pursuant to this Policy may appeal to the BOCC. The decision of the BOCC is final.

#### **4.12 Amendments**

The Nye County BOCC may amend the provisions of this Policy if it determines that any such amendment will be in the best interest of the citizens of the Pahrump Planning District and consistent with the general intent of this Policy.

Proposed amendments shall be filed with the Departments of Public Works and Planning for review and comment. The comments shall be referred to the RPC for their consideration. The RPC shall hold a public hearing on the proposed amendments and shall submit its recommendations to the BOCC. The BOCC shall hold a public hearing on the proposed amendment and shall render a decision.

Notice of the time and place of the public hearing, together with a summary of the proposed amendment shall be published according to the State of Nevada and Nye County laws and requirements.

#### **4.13 Violations and Penalties**

The BOCC may establish fees and penalties for projects and/or developments covered in this APFG that have not complied with the requirements found herein.

#### **4.14 Fees and Mitigation**

The BOCC shall have the authority to establish by resolution fees for APF related services specified in this Policy, but in no event shall the fee charged be more than the costs incurred by the County.

Upon determination that public facilities are not adequate, the project may be disapproved or require mitigation from an applicant to assure that there exist adequate levels of public facilities that are consistent with this Policy.

Mitigation may include one or more of the following:

- a. Dedication of property to the County,
- b. Additional or special impact fees
- c. Fees in lieu of an improvement payment to an escrow account,
- d. Participation in private/public partnerships to provide the facilities,
- e. Off-site improvements, or
- f. Other mechanisms as may be determined

The developer may negotiate with the County and, in lieu of payment of required impact fees, may contribute towards a proposed County CIP that would be scheduled for implementation within three years from the date of the submitted sketch plan. The CIP would need to have some direct benefit to the proposed development and may include a donation of property and/or other related infrastructure to the County. Furthermore, as the final approving authority, the BOCC may consider and determine other mechanisms towards obtaining adequate facilities.

## **5.0 ROADS AND TRAFFIC**

### **5.1 General**

The purpose of this section is to ensure that, to the maximum extent practical, new developments will be approved only when it can reasonably be expected that roads, intersections, and traffic control devices will be available to accommodate such new developments.

### **5.2 Public Right-of-Way**

Public Right-of-Way (ROW) shall be dedicated to the County by the developer. The width of the ROW shall be consistent with the Pahrump Regional District Streets and Highways Master Plan. The Public Works Director shall resolve any areas of confusion or discrepancies within the Master Plan. This decision may be appealed to the BOCC, their decision is final.

### **5.3 New Public Roads**

New public roads to be built as part of the new development shall be constructed to the standards prescribed in the Pahrump Regional District Streets and Highways Master Plan, and county's latest standard details and specifications for public improvements.

- 5.3-1 The type of road to be built shall be based on the projected combined total of the Average Daily Traffic (ADT) generated by the new development and projected future background ADT for a minimum 20-year planning horizon as determined by the Public Works Director and/or NDOT in accordance with the aforementioned standards.
- 5.3-2 The Public Works Director and/or NDOT may require that a traffic impact study for proposed commercial or residential development be prepared and provided by the developer.

### **5.4 Existing Public Roads**

Existing public roads that serve the new development shall at a minimum meet the standards contained in the Pahrump Regional District Streets and Highways Master Plan, and Standard Details and specifications for Public Improvements as the new public roads under Section 5.3.

- 5.4-1 The portion of the existing roads required to be adequate for the proposed new development shall be from the centerline to the property line of any road adjacent to the new development. Roads may require to be adequate in several directions or in any one direction from the location of the proposed new development.
- 5.4-2 In evaluating the adequacy of the existing roads or the improvements necessary to make the existing roads adequate, the following shall be considered:
  - a. Existing traffic
  - b. Future background traffic (20-year planning horizon)
  - c. Traffic projected to be generated by the new development
  - d. Traffic projected to be generated by other approved but not constructed development
  - e. Improvements scheduled or approved and funded in the Pahrump Capital Improvements Plan to take place within two (2) years from the anticipated date of final plat approval

- f. Improvements with full funding within a five (5) years schedule of the Nevada Department of Transportation Program
- g. A traffic Impact Analysis that may be required by the Public Works Director and/or NDOT
- h. Any other information that may reasonably be required by the Public Works Director, the Planning Director, NDOT, or other County Departments or Agencies to effectively evaluate the road network or information supplied by the developer.

### **5.5 Private Roads**

The use of private roads is limited and permitted only upon approval by the RPC and Board of County Commissioners. In cases where private roads are expressly permitted, such roads shall be deemed to comply with the access requirements of the aforementioned standards and County's latest design and construction standards.

Private roads shall be confined to closed loops and dead ends not likely to be needed for the convenience and safety of the general public. All private roads shall be posted and so identified on the plat.

### **5.6 Determination of Adequacy**

For all development applications, a Traffic Impact Analysis (TIA) shall be prepared by the developer and submitted to the Public Works Department. The Public Works Director or his/her designate in consultation with the Planning Director or his/her designate shall determine the portion of the existing road(s) required to be adequate. The scope of the TIA shall be established by staff, or if requested by the developer, in a meeting between staff and the developer to establish agreement on a reasonable study area based on knowledge of the site and the situation. At a minimum, the portion of the existing road(s) required to be adequate shall be from the site's planned entrances(s) to the nearest intersection of an arterial road or highway with an arterial road, in the direction of anticipated traffic flow. The TIA shall include impacts that may occur several miles away at intersections of arterial roads and/or highways. Decision of the Director of Public Works on the scoping shall be the final.

### **5.7 Exception**

This article does not apply to developments that generate or are expected to generate less than one hundred (100) total vehicle trips during the highest

daily peak hour of the adjacent street traffic, as defined by the most recent edition of the Institute of Transportation Engineers, (ITE).

In determining whether or not a total of one hundred (100) peak hour vehicle trips will be generated during the peak hour of the adjacent street traffic, all land at one location within the County under common ownership or control by a developer shall be included. The phrase “at one location” means all adjacent land of the developer, the property lines of, which are contiguous or nearly contiguous at any point. A developer shall not avoid the intent of this section by submitting piecemeal applications for preliminary plats or site plans. A developer may seek approval of only a portion of a subdivision or development which generates less trips than the criteria, provided that upon seeking approval of the remaining subdivision or development which generates trips greater than the criteria, including that approved previously under this subsection, the development will comply with the requirements of this section.

If the average daily trips generated by the development are between 100 and 750, the developer may choose to pay a flat traffic impact fee equal to the improvements that would probably be required as a result of a TIA as determined by the Public Works Director.

## **6.0 PARKS AND RECREATION**

### **6.1 General**

The intent of this section of the APFG is to ensure that parks and recreational facilities are installed and maintained as new residential development occurs.

### **6.2 Determination of Adequacy**

Adequate Parks, Recreation Facilities Parks and Recreational Facilities shall be deemed adequate if the following requirements are met:

- 6.2-1 In residential subdivisions where the average net lot size is one (1) acre to five acres, five percent (5%) of the gross project area shall be designed, built and maintained as parks and open space for public use or in the case of a gated community for the use of the residents of that subdivision. Landscaping in street ROW and parking lots shall not be calculated as a part of the parks and open space percentage requirement.
- 6.2-2 In residential subdivisions where the average net lot size is less than one (1) acre, ten percent (10%) of the of the gross project area shall be

designed, built and maintained as parks and open space for public use or in the case of a gated community for the use of the residents of that subdivision. Landscaping in street ROW and parking lots shall not be calculated as a part of the parks and open space percentage requirement.

- 6.2-3 PUD's may have a mix of lot sizes as allowed in the zoning ordinance. All PUD's shall have a minimum of fifteen percent (15%) of the gross project area designed, built and maintained as parks and open space for public use or in the case of a gated community for the use of the residents of that subdivision. Landscaping in street ROW and parking lots shall not be calculated as a part of the parks and open space percentage requirement.

### **6.3 New Park Facilities**

New park facilities shall include a variety of amenities such as tot lots, bar-b-ques, ramadas, picnic tables, ball courts, interpretive experiences, sidewalks, play fields, and pedestrian scale lighting. The new park facilities are to be landscaped and watered by an automatic drip and/or sprinkler system. Passive storm water detention dry or wet ponds designed to accommodate safe public parks and recreation uses may be considered as part of the required contribution. Exact amenities shall be worked out with the Planning Director or his designate.

### **6.4 Existing Park Facilities**

If a new development is within fifteen hundred (1,500) feet of an existing park the Developer and Planning Department may mutually agree to substitute upgrading existing park facilities instead of building a new park. Upgrading existing park facilities may include amenities such as tot lots, bar-b-ques, ramadas, picnic tables, ball courts, interpretive experiences, sidewalks, play fields, and pedestrian scale lighting. The cost of upgrades should be relatively equivalent to the cost of construction of a new park facility and shall not include the cost of the land.

### **6.5 Exemption**

Residential subdivisions with lots that are five net (5) acres or larger in size are excluded from the requirements of this park provision. Homes built on five acres or larger are not exempt from general impact fees for parks.

## **7.0 SEWAGE / WASTEWATER SYSTEM**

### **7.1 General**

All new development shall be served by an adequate public or private sewage disposal system, including collection and treatment facilities. Private treatment facilities shall only be allowed on a case by case basis as determined by the Nye County Public Works Department.

### **7.2 Submittal Requirements**

All applications for development approval of a site plan, and preliminary or final plat shall be accompanied by the appropriate data required by the Public Works Department

### **7.3 Level of Service Standards.**

The level of service standards for wastewater are:

7.3-1 Collection System. All wastewater collection lines shall be designed to accommodate estimated peak flow volumes and to maintain adequate flow velocities for minimal flows using engineering design criteria of the County engineering design standards.

7.3-2 Wastewater Pumping (Lift) Stations. Wastewater pumping stations must be designed with sufficient capacity to meet peak flow demand and all other criteria in the County engineering design standards.

7.3-3 Wastewater Treatment and Reclamation. No proposed development shall cause the design of hydraulic capacity and/or the design organic capacity of the wastewater treatment facility to be exceeded.

### **7.4 Determination of Adequacy**

A sewage disposal system is adequate for a proposed development provided that:

- 7.4-1 For recording a final plat, or site plan, the approved sewage disposal system shall be installed to serve each lot respectively.
- 7.4-2 For a zone reclassification or PUD permit, the timing of installation of required sewerage improvements shall be contained in the approval document.
- 7.4-3 For the issuance of a building permit, tentative map or final plat approval, or other land use approval, the site of the proposed development is or can be served by an existing disposal system, and the disposal system has been confirmed by the Public Works Department as being consistent with applicable state and local design and operating Policies.
- 7.4-4 For the issuance of a certificate of occupancy for a building or change of use permit, the approved sewage disposal system is installed to serve each building or lot.

### **7.5 Individual Sewage Disposal System**

An individual sewage disposal system (ISDS) is adequate, if an on-site ISDS for each individual building or lot is installed to meet the requirements and standards of the approving public health agency in lot size, soils and system design prior to issuance of a certificate of occupancy for a building or change of use permit. An individual lot that contain several units or buildings shall not be approved without submitting an engineering report to the Public Works Department on the adequacy of the design of ISDS.

## **8.0 WATER SUPPLY AND DISTRIBUTION SYSTEM**

### **8.1 General**

It is the intent of this section for new developments to provide an adequate supply of water and a distribution system that will adequately distribute the water in sufficient quantity and pressure at prior to and at the time of build-out. All new development greater than 4 lots/units shall be part of a public water system or State approved private water system owned and operated by a utility company.

### **8.2 Adequate Water Supply and Distribution Facilities**

The water provider shall certify that the source facilities, storage tanks and local pumping stations have sufficient available capacity to provide average day demand and peak hour demand in addition to adequate fire flow; and the distribution system is capable of providing normal required pressure as well

as minimal residual pressure to the proposed development. Where applicable, such certification shall be included in the Adequate Public Facilities Report (APFR) submitted with the development application. It should be noted that water taps (water connections to an existing system) are not guaranteed for the project until such taps are purchased or a multi-year tap agreement has been executed between the water provider and developer.

### **8.3 Submittal Requirements.**

All applications for development approval of a site plan, and preliminary or final plat shall be accompanied by the appropriate data (in APFR where applicable) required by the County Public Works Department.

### **8.4 Level of Service Standards.**

The level of service standards for water are:

8.4-1 Water Supply. The developer shall acquire and maintain sufficient water rights as prescribed by the State of Nevada.

8.4-2 Water Storage. Water storage shall be sufficient to meet water demands during peak-use days.

8.4-3 Water Treatment and Production. The capacity of the water treatment plant shall be sufficient to serve the peak demands of its customers.

8.4-4 Distribution System Pressures. The minimum standard for water system pressures is 40 psi.

If the development does not meet the requirements, the development shall not be approved until it can be rectified.

### **8.5 Determination of Adequacy**

The following criteria shall be used to determine adequacy of the water supply and distribution system:

- 8.5-1 The developer shall produce evidence that the State Engineer has issued water rights sufficient to adequately serve the development.
- 8.5-2 New development water storage and distribution system shall be reviewed and stamped by a Registered Professional Engineer hired by the developer. The engineer of record shall submit a report to the Director of Public Works for review.
- 8.5-3 Upon completion of the all requirements the Public Works Director shall inform the Planning Director that all requirements have been met.

## **9.0 POLICE / SHERIFF SERVICE**

### **9.1 General**

The extension of law enforcement services to newly developed areas of the Pahrump Regional Planning District is a necessary part of urban growth. The intent of this brings current law enforcement levels to national standards.

During 2004, there were 4,090 full-time sworn municipal personnel in Nevada, providing 2.00 officers per 1,000 residents for urban population areas.

There were 972 full-time sworn deputies employed by Nevada's 16 sheriff's departments in 2004, and 367 troopers with the Nevada Highway Patrol. The ratio of enforcement personnel for every 1,000 population in the rural areas was 3.66.

Sheriffs departments statewide maintained 468 full-time civilian employees in 2002. The Nevada Highway Patrol employed a total of 534. Statewide, there were 5,429 full-time sworn law enforcement officers in 2002. This represents an overall ratio of 2.25 officers per 1,000 Nevada residents.

Nationally in 2003, the latest full year of data available, the average number of municipal officers per 1,000 inhabitants ranged from 2.4 to 3.5.

Among the Nation's four regions, law enforcement agencies in the Northeast had the highest rate of law enforcement employees, 3.5 law enforcement employees for every 1,000 inhabitants. Agencies in the South had 3.4 law enforcement employees per 1,000 inhabitants, in the Midwest, 2.7, and in the West, 2.4.

Source The Nevada Highway Patrol presents the ninth annual report of Crime and Justice in Nevada 2004, page 174

[[http://www.fbi.gov/ucr/cius\\_04/law\\_enforcement\\_personnel/index.html](http://www.fbi.gov/ucr/cius_04/law_enforcement_personnel/index.html)]

Currently the level of service in Nye County is below national standards. The following ratios are based upon the official population estimates from the Nye County Planning Department.

- a. North Area Command (Tonopah, etc..) Official population estimate 5,299 staffing is 2.45 deputies including Administrator per 1,000.
- b. Central Area Command (Beatty/Amargosa Valley) Official population estimate 2,288 staffing including Administrator is 2.62 deputies per 1,000
- c. South Area Command (Pahrump) Official population estimate 37,369 staffing is 1.45 deputies per 1,000.
- d. Official (est. based on 2.8% growth 1st, 2nd quarter 2006) population of Nye County is 45,204, ratio of deputies per 1,000 countywide is currently 1.61.

The response time for emergencies is 4.5 minutes and non-emergencies are 8.23 minutes, (this reflects Pahrump only statistics).

To bring Pahrump Valley (South Area Command) substation up to the national average of 2.7 officers per 1,000 at the present official population estimate would require 37 additional deputies. Federal standards recommend 2.4 officers per 1000 residents. Nye County is presently staffed at 1.6 officers per 1000 residents.

The Nye County Sheriff's Office is planning a New Detention Center/Substation and 911 Dispatch Center also which will need to be staffed..

## **9.2 Adequate Police/Sheriff Facilities**

The sheriff's office shall certify that plans for new development have been reviewed and adequate service can be provided to the development.

## **9.3 Submittal Requirements**

- a. Map showing the location and boundaries of the proposed development and location of the nearest Sheriff's office or substation.
- b. The number of residential units and the projected population of the development.
- c. Any other data or information requested by the County necessary to evaluate the adequacy of sheriff and emergency services.

#### **9.4 Level of Service Standards.**

The level of service standard for law enforcement protection is:

9.4-1 A four (4) minute call response time will be maintained.

9.4-2 2.7 officers per 1000 residents.

#### **9.5 Determination of Adequacy**

The following criteria shall be used to determine adequacy:

9.5-1 The information shall be reviewed as to whether or not the application meets the level of service standard for the County.

9.5-2 An escrow account is to be set up for monies to be deposited into to pay a proportionate share of police/sheriff's services imposed on the sheriff's department by the new development.

If a station is planned and will not be available concurrent with Occupancy, the County may approve the Applicant's provision of funds and early construction of a substation and early provision of equipment and be reimbursed by the County at the time it is actually scheduled to occur on the Capital Improvements Plan.

## **10.0 FIRE AND ABULANCE SERVICES**

### **10.1 General**

All new development shall be served by adequate fire protection. New development proposed is to be served by a water supply system that provides at least minimum fire flow and a, road system or fire lane system that provides life safety/rescue access, and other fire protection requirements for buildings.

### **10.2 Adequate Police/Sheriff/Fire Service Facilities**

The Town of Pahrump shall certify that plans for new development have been reviewed and adequate service can be provided to the development.

### **10.3 Submittal Requirements.**

All applications for Development approval of a site plan, and preliminary or final plat shall include the following data:

- a. Map showing the location and boundaries of the proposed development and location of the nearest fire station/engine company, together with the one and one-half mile service boundary of the engine company.
- b. Fire flow to be available at the site in gallons per minute.
- c. Proposed fire hydrant spacing.
- d. Any other data or information requested by the County and Town of Pahrump necessary to evaluate the adequacy of fire and emergency rescue services.

### **10.4 Level of Service Standards.**

The level of service standard for fire protection is:

10.4-1 A ten (10) minute response time, which shall be measured as a five (5) mile travel distance for the nearest engine company.

10.4-2 A minimum fire flow of 1,000 gallons per minute (gpm) in accordance with currently adopted fire flow standards.

10.4-3 Fire hydrant spacing shall be a maximum of five hundred (500) feet.

### **10.5 Determination of Adequacy**

The following criteria shall be used to determine adequacy:

10.5-1 The Town of Pahrump shall review the information provided as set forth herein as to whether or not the application meets the level of service standard for the County.

10.5-2 Does the proposed development lie entirely within the 5-mile service area of an existing fire station/engine company or a planned fire station/engine company, and does it meet the fire flow standards?

10.5-3 If a station is planned and will not be available concurrent with Occupancy, the County may approve the Applicant's provision of funds and early

construction of the station and early provision of equipment or the applicant can provide mitigation measures as contained in the interim standards for fire protection. These interim standards are designed to provide an increased level of individual structure fire protection where a project is outside the fire service areas.

## **10.6 Interim Fire Protection**

The interim fire protection system shall be capable of providing the same level of fire protection service as if it were hooked up to a water supply and distribution system.

10.6-1 The adequacy of an interim fire protection system in the proposed commercial or industrial development shall be determined by the Public Works Department and the Town of Pahrump or any other properly established agency including organizations charged with fire protection with the legal authority and responsibility to construct, maintain, improve or permit hook up to the water supply system.

10.6-2 A commercial or industrial development shall provide an interim fire protection system if it is determined that water supply and distribution system is not available or scheduled in the Capital Improvements Program of any responsible agency to be in service within two (2) years, and the commercial or industrial development proposes more than 2,000 square feet of new commercial, industrial or institutional enclosed area.

## **10.7 Exception**

Nothing under the terms of this Policy shall prohibit the County from reaching an agreement with a developer concerning the construction of the necessary improvements for the purpose of ensuring that public facilities are adequate as required by this document.

# **11.0 DRAINAGE AND FLOOD CONTROL**

## **11.1 General**

The intent of this section of the APFG is to ensure new development provides the necessary storm water drainage and retention/detention facilities.

## **11.2 Storm Frequency Criteria**

The design rainfall event is based upon the 100-year storm duration that generates the peak discharge for the area contributing runoff to the development. This design storm shall be used in designing the overall development drainage system to insure compliance with FEMA elevation guidelines and requirements. The actual storm duration that causes peak discharge may vary depending on physical watershed conditions with the maximum design duration up to 24hrs.

## **11.3 Roadway Hydraulic Design Criteria**

Roadways and streets with or without curb and gutter shall be designed such that during the peak discharge storm event, longitudinal flows are contained below the finished floors of buildings, maximum peak flow is 100 cfs, and maximum velocity is 10 feet per second. Special roadways or dip sections designated as conveyance corridors shall only be allowed with written approval by the Director of Public Works.

Cross road culverts shall be designed such that during the peak discharge storm event, runoff can be conveyed by the facility and by flow over the road to a maximum depth of 6 inches.

## **11.4 Determination of Adequacy**

The Public Works Director shall review the development plan and engineering documents relative to approval of all drainage analysis, design and proposed facilities. The following criteria shall be used to determine adequacy:

- 11.4-1 All drainage way entrances and exit points in new developments must remain in the original location and as much as possible in the original conditions unless otherwise approved by the Director of Public Works.
- 11.4-2 Walls, fences, decorative borders, berms and other similar structures or features having an adverse effect on adjacent land, or that obstruct, retard or divert any drainage water ways or other drainage features are not permitted without first obtaining written approval by the Director of Public Works.
- 11.4-3 Permanent, durable and least cost in maintenance drainage conveyance and storm water management facilities shall be used as drainage facilities wherever possible.

- 11.4-4 A right-of-way or public utility easement shall not be designated for drainage or retention without prior written approval of the appropriate agency or affected utility.
- 11.4-5 All developments shall design retention systems to receive and retain the peak flow and volume generated from the 100 year, 2 hour rainfall event falling within the entire boundaries of the proposed development including all right-of-way, excluding off-site flows.
- 11.4-6 Detention and retention basins are intended to mitigate the effects of urbanization on storm drainage. They often require a commitment of land resources by the community or land developer and therefore its planning should consider multiple uses like parks or other recreational facilities and amenities. Where the watershed plan indicates the need for storm water channel or facilities located within the development area or downstream improvement may be required, the developer shall be required to contribute land or downstream improvement fees proportional to his share.
- 11.4-7 Design of drainage facilities must address safety issues. Signage must be provided to identify hazards to the public.
- 11.4-8 Underground storm drain pipes or culverts to be assumed by the County shall be no smaller than 24" in diameter.
- 11.4-9 Finished floor elevations of structures shall be in compliance with FEMA elevation guidelines and requirements.

### **11.5 Stormwater Disposal**

On-site runoff that has been retained shall be disposed of within 36 hours either by percolation, drywells or draining into an approved drainage way. If runoff is to be conveyed by an underground system, complete detailed plans shall be submitted. Under no circumstances shall on-site runoff exceed the carrying capacity of the receiving and approved drainage way.

### **11.6 Exception**

The requirement for new developments to provide retention or detention facilities shall not be waived unless absolutely necessary on a case by case basis as determined by the Public Works Director.

## **12.0 PUBLIC SCHOOL**

### **12.1 General**

The purpose of this Policy is to ensure that, to the maximum extent practical, new residential development will be approved only when it can reasonably be expected that adequate public school facilities will be available to accommodate such new development. The applicant shall submit to the School District all information reasonably deemed necessary by the School District.

### **12.2 Capacity Levels**

Adequate service levels for public schools shall be deemed to exist with respect to a proposed new residential development if, given the number of school age children projected to reside in that development, the number of students projected to attend the elementary schools, the middle schools, and the high school[s] within the School District will not exceed the following percentages of the building capacities of each of the following three school levels:

- a. Elementary School Level 105%
- b. Middle School Level 107%
- c. High School Level 110%

For purposes of this Policy, the term "building capacity" means the capacity of permanent buildings, not mobile units or trailers.

### **12.3 Concurrency**

12.3-1 Schools shall be considered to have been provided concurrently with the development which will impact the schools if:

- a. The permanent and interim improvements necessary to serve the development are planned to be in place at the time the impacts of development are expected to occur; or
- b. The necessary financial commitments are in place to assure the completion of the needed improvements to meet the district's standard of service within 2 years of the time that the impacts of development are expected to occur. Necessary improvements are those facilities identified by the district in its capital facilities plan.

12.3-2 Any combination of the following shall constitute the "necessary financial commitments" for the purposes of subsection "a" below.

- a. The district has received voter approval of and/or has bonding authority;
- b. The district has received approval for federal, state, or other funds;
- c. The district has received a secured commitment from a developer that the developer will construct the needed permanent school facility, and the school district has found such facility to be acceptable and consistent with its capital facilities plan; and/or
- d. The district has other assured funding, including but not limited to school impact fees, which have been paid.

#### **12.4 Applicability**

This Policy is general in nature and applicable to all property subject to land use regulation by the Pahrump Regional Planning District. Except as otherwise provided herein, the provisions of this Policy shall apply to applications for approval of subdivision plats, site plans and conditional or special use permits that are submitted for approval after the effective date of this Policy.

The provisions of this Policy shall apply to subdivision preliminary plats, site plans and conditional or special use permits that have expired.

#### **12.5 Appeal of School District Denial**

The applicant that is denied by the School District may, within 30 days of the date of the denial, request an appeal to the BOCC. Any such appeal shall be heard at a hearing before the BOCC. At this hearing the School District will present its reasons for denial and the applicant may present its reasons why the application should have, in its view, been approved. The BOCC may do one of the following: affirm the decision of the School District, remand to the School District for further proceedings in the event evidence is presented at the hearing before the BOCC not brought before the School District, or overturn the denial of the School District.

#### **12.6 Credit for improvements**

Whenever a development is granted approval subject to a condition that the development proponent actually provide a school facility acceptable to the district, the development proponent shall be entitled to a credit for the actual cost of providing the facility, against the fee that would be chargeable under a tax on residential construction as prescribed in NRS 387.331. The cost of construction shall be estimated at the time of approval, but must be

documented and the documentation confirmed after the construction is completed to assure that an accurate credit amount is provided. If construction costs are less than the calculated fee amount, the difference remaining shall be chargeable as a school impact fee.

## **12.7 Exemption**

Exemptions from the application of the concurrency standard are:

- a. Building permits for individual single family dwellings;
- b. Any form of housing exclusively for senior citizens, including nursing homes and retirement centers;
- c. Shelters for temporary placement, relocation facilities and transitional housing facilities;
- d. Replacement, reconstruction or remodeling of existing dwelling units;
- e. Building permits applied for prior to the adoption of this Policy.