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U.S. DEPARTMENT OF THE INTERIOR

DRAFT
ENVIRONMENTAL STATEMENT

FOR THE
RED ROCK RECREATION LANDS

LAS VEGAS, NEVADA



PREPARED BY
NEVADA STATE DIRECTOR
BUREAU OF LAND MANAGEMENT
RENO, NEVADA

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DEPARTMENT OF THE INTERIOR

DRAFT
ENVIRONMENTAL STATEMENT
ON THE
RECREATION MANAGEMENT PLAN FOR
RED ROCK CANYON RECREATION LANDS
Las Vegas, Nevada

PREPARED BY

NEVADA STATE OFFICE, RENO, NEVADA
BUREAU OF LAND MANAGEMENT
U. S. DEPARTMENT OF THE INTERIOR



STATE DIRECTOR, NEVADA

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SUMMARY

(X) Draft () Final Environmental Statement

Department of the Interior

1. Type of Action: (X) Administrative () Legislative

2. Brief Description of Action:

The major Federal action described in this statement is the implementation of a recreation management plan for the Red Rock Canyon Recreation Lands through action of full management and development.

The Red Rock Canyon Recreation Lands consist of 62,000 acres of public land and 2,000 acres of private land, located 13 miles west of Las Vegas, Clark County, Nevada.

3. Summary of Environmental Impact and Adverse Environmental Effects:

A. Vegetation removal	F. Water quality and quantity
B. Soil disturbance	G. Increased air pollution
C. Wildlife displacement	H. Increased noise
D. Public use concentration	I. Natural visual change
E. Cultural degradation	J. Increased public enjoyment and education

4. Alternatives for Management Discussed:

The principal alternatives to the proposed action of full management and full development of the Red Rock Recreation Lands are:

- I. Full development below the escarpment with limited development above the escarpment.
- II. Limited development below and above the escarpment.
- III. Full development below the escarpment with only primitive development above the escarpment.
- IV. No further action utilizing the area in its present condition.
- V. Restricting visitor use to day use only with no overnight camping.
- VI. Holding the area as is until another agency can take over management.

5. Comments have been Requested from the Following:

National Park Service
Bureau of Outdoor Recreation
Clark County Planning Department
Desert Research Institute
U. S. Forest Service
Nevada Fish & Game Commission
Nevada State Highway Department
Soil Conservation Service
Nevada State Parks Commission
U. S. Geologic Survey
SO. Nevada Historical Society
State Park Advisory Commission
City of Las Vegas
City of North Las Vegas
Governor, State of Nevada
and others

6. Date Draft Statement made Available to CEQ and the Public:

RED ROCK CANYON RECREATION LANDS
DRAFT ENVIRONMENTAL STATEMENT

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DESCRIPTION OF THE PROPOSAL

The Red Rock Canyon Recreation Lands are located 15 miles west of Las Vegas, Nevada. (See Map #1, page 2). On June 27, 1967 these lands (approximately 64,000 acres) were classified for multiple use management and segregated from appropriation under the agricultural, public sale and mining laws. The designation of this area as the Red Rocks Canyon Recreation Lands was published in the Federal Register in October 1967. Also, during October 1967 the area was formally dedicated as Recreation Lands.

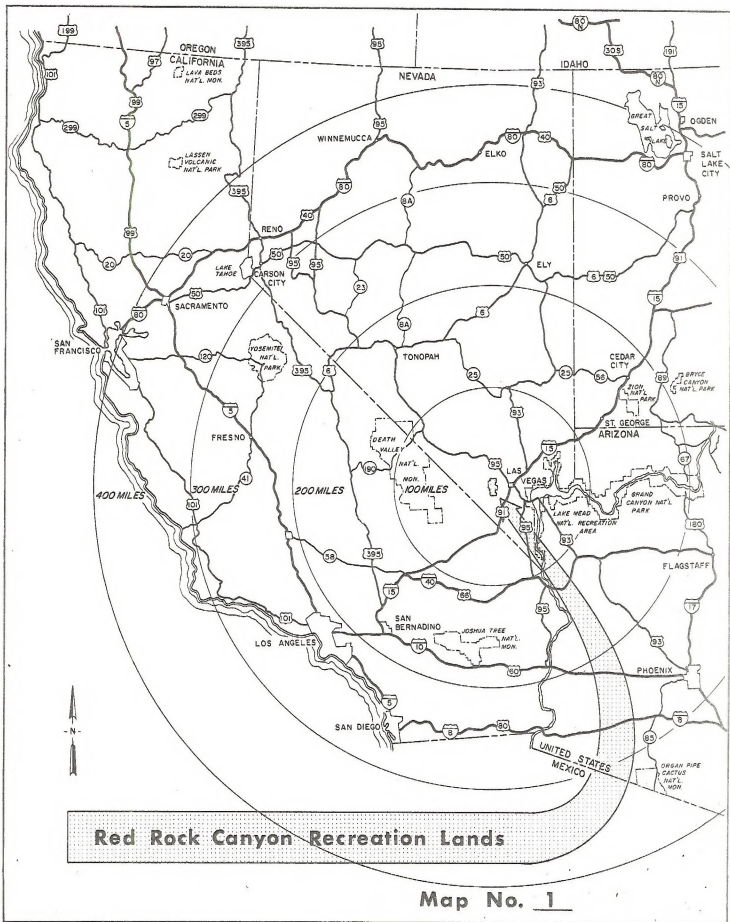
In 1968 a comprehensive recreation plan for the management and development of the area was prepared to guide future actions. The purpose of this statement is to evaluate the environmental impacts which could result from implementation of this plan.

Proposals included in the plan are as follows:

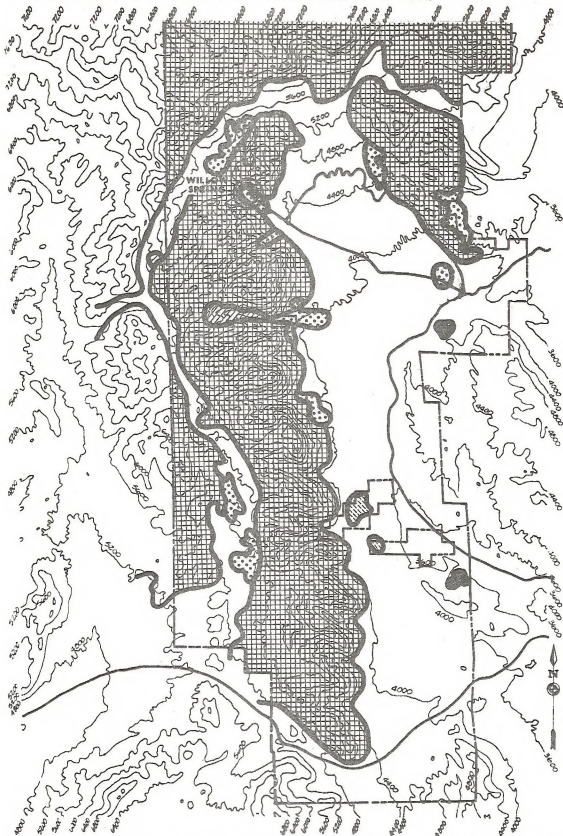
Resource Management

A plan was developed to guide the resource management and protection programs for the area. (See Map #2, page 3). Management practices and programs were categorized into zones or areas of proposed use. Uses prescribed in these zones in the plan are as follows:

Wild Areas. These areas would be dedicated to preserving the wilderness experience. Improvements would be restricted to trail development, primitive camp and picnic sites, rustic interpretive and directional signs, primitive facilities for visitor protection and safety, and other facilities which would be essential for visitor and resource protection in a wilderness environment, such as fire suppression facilities. No motorized vehicles would be allowed in areas classified as wild.



PROPOSED RESOURCE MANAGEMENT UNITS



LEGEND

□ OPEN SPACE

▣ DEVELOPMENT AREA

▨ COMMERCIAL SERVICES

▤ NATURAL AREA

▧ WILD AREA

■ ADMINISTRATIVE AREA

MAP
NO.
2

Other uses such as livestock grazing, watershed protection and wildlife development would be permitted but would have to abide by the constraints established in other sections of the plan.

Open Space - Corridor Areas. The primary function of this area would be to provide the spacial needs from which the scenic attractions could be viewed. Vehicular traffic would be permitted on designated roads and trails. Roads would be located so as to offer the best views and yet be unobtrusive. Improvements, with the exception of roads and trails, would generally be on the perimeter and concealed so as not to mar the view. The color, texture and height of all structures within this area would be designed and constructed so as to harmonize and blend in with the immediate environment. Other uses such as livestock grazing, watershed protection, and wildlife development would be permitted but would have to abide by the constraints established in other sections of the plan.

Natural Areas. These are areas where unique management programs would have to be developed to preserve, protect and study natural resources and/or processes. Two such areas have been identified in the Red Rocks as follows:

Pine Creek Natural Area. The entire North Fork of Pine Creek would be set apart exclusively for scientific study and protection of the ecological community, and all recreation use would be excluded from the area. The Bureau would control the use in this area by issuing special land use permits or some other suitable control system.

Lone Pine Natural Area. The Lone Pine area contains an intermingling of the four major plant communities in the Red

Rocks area. This area would be preserved for public viewing and study. Specific programs would be developed to protect, preserve and interpret this unique ecological community.

Recreation Development Areas. Intensive recreation activities would be planned for this area. Improvements which would be allowed include campgrounds, picnic sites, overlooks, interpretive facilities, active play and recreation areas, and other compatible recreation facilities.

Commercial Public Service Areas. These areas would be set aside for private development to provide special services and facilities not otherwise obtainable and which would not be inconsistent with the goals of the master plan. There are two such areas shown in the recreation plan as follows:

Lodges. The plan identifies the old Wilson Ranch as a possible lodge area. Compatible uses would include restaurant, motel, general store supplies, and tour services.

Dude Ranch. The Bonnie Spring Ranch area is identified as a possible dude ranch. Acceptable uses would include horse rentals and tours, living quarters for operators, and eating facilities.

Administrative Areas. Three areas are identified for administrative uses. These areas and uses are:

Blue Diamond Administrative Site. This site would accommodate permanent housing for the Chief Ranger and his staff. Also included would be office, maintenance and storage facilities.

Mountain Spring Administrative Area. This is primarily an area to accommodate fee collection and dissemination of visitor

information. There would also be a small area for living quarters, maintenance equipment, and rescue equipment.

Dump. A sanitary landfill would be provided in the area as shown on Map No. 3, page 7.

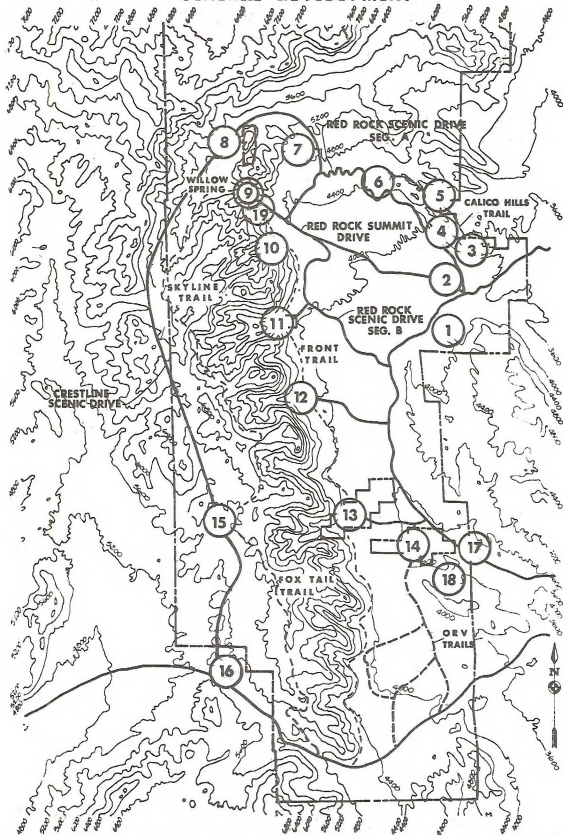
Visitor Management

The plan includes a section on programs and developments which would provide a safe and interesting experience for the visitor. This would include programs for information and interpretive services, visitor protection, commercial accommodations, and a definition of the recreation activities which would be encouraged in the area. Developments planned to implement these programs are as follows:

<u>Roads and Trails</u>	<u>Standards</u>	<u>Approximate Length</u>
Red Rocks Scenic Drive	24' paved surface	15 miles
Crestline Scenic Drive	24' paved surface	20 miles
Brownstone Loop Road	14' graveled surface	3.5 miles

Other developments planned to provide for orderly use of the area are shown on Chart No. 1 on page 8.

GENERAL DEVELOPMENT



LEGEND

- 1 BLUE DIAMOND ADM.
- 2 INTERPRETIVE CENTER
- 3 RED SPRINGS
- 4 CALICO SPRINGS
- 5 ASH CREEK
- 6 SANDSTONE QUARRY

- 7 WHITE ROCK
- 8 LA MADRE CANYON
- 9 ROCKY GAP
- 10 ICE BOX
- 11 PINE CREEK
- 12 OAK CREEK

- 13 LODGE ZONE
- 14 DUDE RANCH
- 15 RAMS HEAD
- 16 MOUNTAIN SPRING ADM.
- 17 CONTACT STATION
- 18 DUMP
- 19 LOST CREEK

MAP
NO.
3

Development Sites	Recreation Facilities								Remarks
	Picnic Units	Camp Units	Parking Spaces	Trailhead Interpretive Facilities	Information Facilities	Water Facilities	Toilet Facilities	Overlook	
Red Springs	X		X			X	X	X	Group picnic use - play fields
Calico Springs			X			X	X	X	Girl Scout Camp - group facilities
Ash Springs	X		X	X		X	X	X	
Sandstone Quarry	X		X	X	X	X	X	X	Also wayside exhibit
White Rock	X		X		X	X	X	X	Also photo point
Rocky Gap		X	X	X	X	X	X	X	
La Madre Canyon		X	X			X	X	X	
Lost Creek	X					X	X	X	Walk-in picnic facilities
Ice Box		X	X			X	X	X	
Pine Creek	X		X	X	X	X	X	X	Also guard station
Oak Creek		X	X	X		X	X	X	Group camping
Rams-Head	X	X	X	X	X	X	X	X	
Visitor Center			X		X	X	X	X	Also exhibit - adm. bldg. and Amphitheater
Lodge Area			X			X	X	X	Also restaurant, motel, general store and tour services
Dude Ranch			X	X		X	X	X	Also residences, barns, corrals, and restaurant
Blue Diamond Adm. Site			X			X	X	X	Also residences, maint. shop, equip. storage and office space
Mtn. Spring Adm. Site			X			X	X	X	Also residences, fee station and equip. storage

Development Schedule

Following is the proposed sequence for development. The exact timing for development would depend on the availability of funds and manpower. The plan envisions completion of construction within ten years.

Phase I

Red Rock Scenic Drive (Segment B)
Visitor Center Complex (Phase I)
Rocky Gap Campground
Sandstone Quarry Wayside Picnic Site and Trailhead
White Rock Road and Picnic Site

Phase II

Visitor Center Complex (Phase II)
Blue Diamond Administrative Site
Pine Creek Road and Recreation Facilities
Red Springs Picnic Site
Calico Springs Girl Scout Camp
Ash Creek Picnic Site
Front Trail

Phase III

Crestline Scenic Drive
Rams-Head Development
La Madre Canyon Campground
Mountain Springs Administrative Site
Skyline Trail

Phase IV

Lost Creek Picnic Site
Ice Box Campground
Oak Creek Road and Campground
Lodge and Dude Ranch Complexes
Brownstone Loop Road

Relationship with Other Projects and Proposals

There are three major recreation developments in Clark County, all of which may be viewed as alternatives to the Red Rock area. The most extensively developed and used is Lake Mead National Recreation Area, developed and operated by the National Park Service. Second in order of popularity is Mt. Charleston, an area developed and operated by the U. S. Forest Service. The third major area is Valley of Fire State Park, developed and operated by the State of Nevada Division of Parks.

There is some overlap among the recreation opportunities already available and those proposed at Red Rocks. Each area has a unique and definite role in the overall recreation complex. Water activities, available at no other area under consideration, are the unique contributions of Lake Mead. Valley of Fire alone provides an unusual opportunity for viewing very colorful and delicately eroded sandstone formations. Mt. Charleston is an area of unexpected summertime coolness in a harsh desert environment sought out by tourist and resident alike. Also, it provides the only winter sports facilities in the region.

The Red Rock Canyon Recreation Lands offer the visitor a different experience with both a desert environment and a high elevation area at

the same general destination near the city limits of Las Vegas, Nevada. At present, there are no developed areas in Southern Nevada with a comparable variety of recreational environments and no undesirable seasons of use as exist here.

There are several primitive and wilderness area proposals in the Las Vegas vicinity which relate to developments proposed at Red Rocks. Following is a summary of the approximate acreage proposed for the various primitive classifications:

Roadless Area Proposals	1,826,000 acres
Primitive Area Proposals	142,000 acres
Wilderness Area Proposals	<u>1,923,000</u> acres
Total	3,891,000 acres

The breakdown by agency and area is shown on Chart No. 2 on the following page.

Primitive and Wilderness Proposals
in Las Vegas Vicinity

Area	Acreage	Status
<u>Bureau of Land Management</u>		
Sun Rise Mtn.	10,000	Designated primitive <i>Natural area</i>
Highland Range	25,280	Designated roadless
Caliente Resource Area	119,500	Proposed primitive
<u>National Park Service</u>		
Lake Mead Nat'l. Rec.	480,000	Proposed wilderness designation
Lake Mead Nat'l. Rec.	1,766,000	Proposed roadless designation
<u>Bureau of Sport Fisheries and Wildlife</u>		
Desert Nat'l. Wildlife Range	1,443,000	Proposed wilderness designation
<u>U. S. National Forest</u>		
Mt. Charleston	35,000	Designated roadless
Mt. Charleston	2,500	Designated natural area
<u>Nevada State Park</u>		
Valley of Fire	10,000	<u>1/</u> Proposed primitive designation

1/ Includes adjacent BLM lands.

Chart No. 2

DESCRIPTION OF THE ENVIRONMENT

INTRODUCTION

The following is a description of the environment without the Master Plan, both for the present and the future. The majority of the land is in Federal ownership.

Physical Factors

The lands under consideration are located at the southern end of the Spring Mountain Range, approximately 15 miles west of Las Vegas, in Clark County, Nevada's fastest growing area. Present access to the area is by paved county road. Within the area vehicular access is by gravel and paved BLM maintained roads.

Climate

The climatic conditions in the Red Rock area are characterized by low annual rainfall, high summer temperatures and mild winters. Arid to semi-arid conditions prevail.

Mean annual rainfall within the Red Rocks area varies from approximately 6 inches at the 4,000-foot elevation to a maximum of 12 inches at elevations above 7,000 feet. This area is located in the rain shadow of the Sierra Nevada Mountains. Frontal systems from the Pacific Ocean show a marked decrease in moisture on the lee side of the mountains. The descending air becomes drier and warmer, resulting in decreased precipitation. Rainfall from this source contributes over 50% of the mean annual rainfall. During the summer, moist air from the Gulf of Mexico moves northward. This is the moisture source for high intensity, short duration thunderstorms experienced in July through September. The continental land mass furnishes moisture for precipitation

occurring usually in November and February.

Most of the mean annual rainfall may be received from one or two storms. Summer thunderstorms may have intensities of 2 - 4 inches per hour; however, these storms seldom maintain these intensities for more than one hour.

Based on long term records, anticipated 6- and 24-hour rainfall amounts for selected reoccurrence intervals follow:

	<u>Reoccurrence Intervals</u>			
	<u>2 Yr.</u>	<u>25 Yr.</u>	<u>50 Yr.</u>	<u>100 Yr.</u>
6-hour rainfall amounts	1.1"	2.0"	2.2"	2.4"
24-hour rainfall amounts	1.4"	2.6"	3.0"	3.4"

During the summer, temperatures in the southern Nevada area can be expected to reach daytime levels of 100°F., with relatively cool summer nights. Winters are usually mild and pleasant, with daytime temperatures near 60°F., and generally clear skies and warm sunshine. Relative humidity ranges from 10 to 35%, causing diurnal temperature changes of 30-35°F.

Las Vegas Valley has a recorded average annual temperature of 65.7°F., with a maximum of 117°F., and a minimum of 8°F. Short term records from the Little Red Rocks weather station reflect lower temperatures below the Red Rock escarpment. These records indicate 62°F. as an average annual temperature, with highs of 110°F., and lows of 5°F. Because of the 3,000 foot difference in elevation between the base and the top of the escarpment, a corresponding temperature differential can be expected. The average annual temperature at the top of the escarpment is near 55°F., with highs of 98°F. and lows of about 0°F.

Winds associated with major storms are strongest during late winter to early summer and accompany the Pacific frontal and continental

cyclone systems. Pacific frontal systems generate prevailing southerly winds during March through September with average speeds of 4 to 6 miles per hour, and northerly winds the rest of the year with average speeds of 13 to 16 miles per hour. These distinct flow patterns are caused respectively by the presence of a deep thermal low pressure trough over the interior during the summer months, and frequent outbreaks of cold polar air masses over the Great Basin of Nevada and Utah during the winter months. Continental cyclone systems produce no distinct prevailing wind direction patterns. Gentle afternoon breezes can be expected about 30% of the time in the Red Rocks, but are stronger in the canyons than the valley floor. Wind gusts in excess of 50 miles per hour may accompany summer thunderstorms.

Evaporation rates in the Red Rock area are high due to high temperatures, low humidity and generally continuous air movement. Evaporation data indicates a yearly normal evaporation rate of 82 inches from a free water surface.

Normal climate cycles are expected to continue for the Las Vegas area. The environmental influence from the Red Rocks in its present condition should not affect the natural climatic situation in the future.

Topography

The predominant feature of the Red Rock area is the escarpment which extends the entire length of the designated area. The escarpment rises 3,000 feet from the alluvial terraces and has a crest elevation of approximately 7,000 feet. In back of the escarpment, the terrain with a well developed drainage pattern, gradually slopes to the west. Several steep canyons within the escarpment contain unique topographic features such as massive boulders, rock chimneys, cliffs and ephemeral

waterfalls.

East from the base of the escarpment, at elevations of 3,600 to 4,000 feet are pediments and gently sloping alluvial terraces dissected by numerous arroyos. Two primary drainages dissect the low lying areas. They are known as Red Rock Wash and the Cottonwood Valley.

Blue Diamond Hill and the Calico Hills form the eastern boundary of the Red Rocks. These are composed of erosional remnants of multi-colored sandstone in many unusual shapes. The La Madre Mountains form the northern boundary of the Red Rocks area. The mountains' southern exposure is comprised of even, dissected slopes.

Water

There are three sources of water in the Red Rocks area: (1) surface water from spring discharge; (2) overland flow from precipitation; and (3) groundwater.

Surface water occurs in the form of 41 springs within the area with reported flows from less than 0.1 gpm (gallons per minute) to 188 gpm. The total quantity from the spring sources is approximately 350 gpm. Chemical analysis available for three springs in the area indicates that, with proper treatment, United States Public Health Service standards for drinking water can be met. At the present time many of the springs are unprotected. Use by animals and people has resulted in surface water degradation. Most spring waters are in private ownership through appropriation under the Nevada State Water Laws. Exceptions are Icebox Canyon Spring and Lost Creek Spring.

Overland flow resulting from rain storm and snow melt runoff occurs at irregular intervals. Summer convective storms of short duration and high intensity have caused flood flows in Red Rock Wash and Cottonwood

Valley. The U. S. Geological Survey estimated that in the Red Rock Wash near Rocky Gap approximately 8,900 c.f.s. (cubic feet per second) were produced from 7.9 square mile drainage area in 1969. Lesser floods occur at irregular intervals and are generally produced from areas of less than 10 square miles with the flood flows usually absorbed into the streambed alluvium.

Two small reservoirs, constructed by the Civilian Conservation Corps, are located in the northern Red Rock area and usually contain water the year around.

The Red Rock area occupies a segment of ground water intake along the western margin of the Las Vegas ground water basin. It is chiefly related to outwash and valley fill deposits below 4,000 feet, along a topographically low portion of an overthrust slice between the Spring Mountain Keystone Thrust to the west, and less continuous thrusts to the east. The base of the sandstone escarpment is a favorable area for the occurrence of subsurface water, fed by numerous springs and runoff along the mountain front. From these intake areas, the ground water moves downward and laterally in the direction of the hydraulic gradient toward the Las Vegas ground water basin.

Point locations of ground water aquifers within the Red Rocks area have been determined by the use of data from existing wells. One aquifer is located in the alluvium along Red Rock Wash. A well drilled near Red Rock Wash at Rocky Gap by the Bureau of Land Management shows a production capacity of 50 gpm at a depth of 88 feet below ground surface. At another site drilled adjacent to Red Rock Wash several miles to the east of this well, water was found at a depth of 430 feet, having a static level at 404 feet below the ground surface with

a production capacity of 25 gpm. A number of private wells in the alluvium at Calico Basin tap an aquifer fed primarily by springs in the Aztec Sandstone. Existing wells in the vicinity of Blue Diamond and the Bar Nothing Ranch indicate the presence of an aquifer in the alluvium.

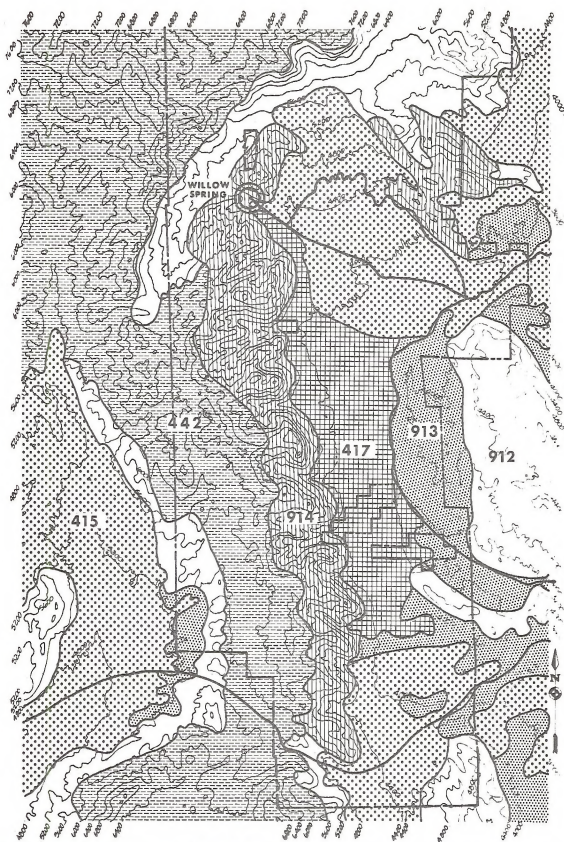
Ground water quality in the Red Rocks area is thought to be generally acceptable. Water from existing wells has had limited chemical analysis, and it appears that with proper treatment, these supplies will meet or exceed the USPHS Drinking Water Standards. Private wells in Calico Basin and Cottonwood Valley are currently used to supply domestic water. It is assumed the water is of acceptable quality as it is not being treated.

Soils

Generally, soils in the Red Rock area are composed of sandy loams, 35-60% gravels, calcareous, and have a mean annual temperature of 15-22°C. at 2 feet. The depth to hard pan is from less than 10" to over 60".

The Red Rock area is divided into six soil mapping units (see Map #4, page 19). Each mapping unit is assigned a number and represents percentages of the different soils identified by the Soil Conservation Service when making their reconnaissance survey.

No detailed interpretation has been made as to the feasibility of the soils in the Red Rock area for road and building construction or installation of sewage disposal facilities. A site study and analysis would have to be made on the specific areas or sites before any construction activity could be initiated.



LEGEND
SOIL MAPPING UNITS (S.C.S.)

 415
 417
 442
 912

 913
 914

MAP
 NO.
 4

Mapping Unit 415

Typic Paleorthids (40%); Typic Torriorthents (30%); Typic Calciorthids (25%).

This mapping unit occurs on the higher dissected alluvial fans below limestone hills in the survey area. It consists of undulating to steep gravelly ridges and side slopes with narrow drainageways. The main slopes are around 8% with side slopes up to 30%. The soils have a 30-60% surface cover of gravels with some stones near the heads of some alluvial fans in larger drainageways. The soils are shallow to deep, calcareous, medium to coarse textured with more than 50% gravel.

Mapping Unit 417

Typic Torriorthents (65%); Typic Haplargids (15%).

This mapping unit occurs on moderately to strongly sloping, short alluvial fans below the unit (914) in the Red Rock Recreational area. These fans are generally not more than one-half mile in length, with stabilized side slopes into the drainage system. The unit consists of deep, reddish-brown, very gravelly loamy calcareous soils. These soils are developing in alluvium from reddish sandstone cliffs, and generally contain 40-80% sandstone fragments that range in size from gravels to stones throughout the control section. The 6- to 10-inch surface layer is normally moderately coarse textured and nongravelly.

Mapping Unit 442

Ustollic Haplargids (35%); Lithic Ustollic-Calciorthids (35%); Limestone Rock outcrop (20%).

This mapping unit occurs in the Spring and Sheep Mountains in the survey area above 5,000 feet. It consists of rolling to very steep

mountain ridges, side slopes and narrow drainageways that are normally bedrock controlled. The soils are brown, shallow, moderately deep and calcareous gravelly loams that are developed in limestone derived material with some eolian additions.

Mapping Unit 912

Typic Torriorthents (40%); Typic Paleorthids (25%); Limestone Outcrop (25%).

This mapping unit occurs as dry desert mountains in the survey area. It consists of very steep to perpendicular fault block front that is mainly rock outcrop with a moderate dip on the back slope. Elevations from the base to the summit range from 200 to over 1,000 feet.

Mapping Unit 913

Typic Torriorthents (45%); Typic Calciorthids (25%); Limestone Rock Outcrop (15%).

This mapping unit occurs on the low, rolling, limestone-controlled hills in the survey area. It consists of low, normally less than 250 feet, steep escarpments on one side having moderate to steep back slopes. Also included in the unit are low, rolling, limestone-controlled hills that may be isolated or associated with the dry desert mountains that are in the (912) unit. The surface varies from gravelly to very gravelly and cobbly with occasional stones. The control section is very gravelly and high in carbonates.

Mapping Unit 914

Sandstone Rock Outcrop (90%).

This mapping unit occurs as sandstone bluffs along the eastern front of the Spring Mountains. The miscellaneous land type here consists

of very steep, barren, sandstone ridges that range from 1,000 to 2,000 feet in elevation.

This unit is unique in the survey area due to the steep slopes and high percent of rock outcrops. There are no similar mapping units to date, though unit (912) has components that are similar.

Vegetation

The Red Rock Canyon Recreation Lands contain a complex, diversified vegetative cover. Different patterns of slope, exposure, elevation, soils, drainage, and micro-climate result in a complex mosaic of vegetative plant communities. There are three basic groupings of vegetative types which are broken down into subtypes of similar plant composition (see Map #5, page 24). The basic groupings are: (1) desert shrub; (2) riparian and cliff vegetation; and (3) higher elevation wooded land.

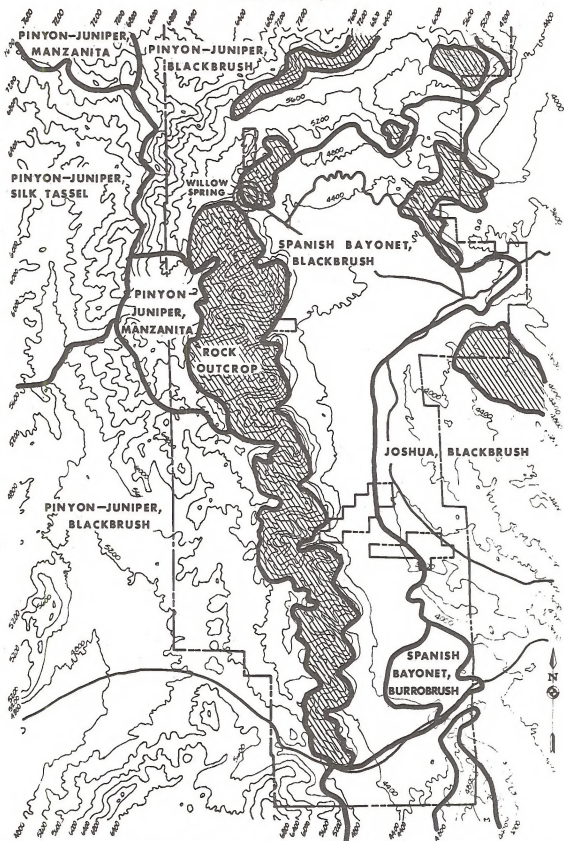
1. The desert shrub area is found generally to the east of the sandstone escarpment and contains three vegetative subtypes: (a) Spanish bayonet-blackbrush community; (b) Joshua-blackbrush community; and (c) Spanish bayonet-burro brush community.

a. The Spanish bayonet-blackbrush community supports Spanish bayonet and banana yucca as an overstory, with a typical understory of blackbrush, mormon tea, cheese-bush, spiny menodora, desert almond, sagebrush, bud sage, cholla cactus, dalea, turpentine bush, desert willow and catclaw. Grasses commonly found include needlegrass, bush-muhly, rough tobosa, rice grass, and sand dropseed.

b. The Joshua-blackbrush community supports Joshua tree and Spanish bayonet as an overstory with a predominantly shrubby understory of blackbrush, creosote bush, burro brush, mormon tea, white sage, range rateny, paper-bag bush, and various cacti such as cholla and beavertail. Needlegrass and rough tobosa are the dominant grasses found in this community.

c. The Spanish bayonet-burrobrush community supports Spanish bayonet as an overstory, with an understory composed predominantly

VEGETATION



LEGEND

MAP
NO.
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of burro brush, hop sage, mormon tea, spiny menodora, white sage, creosote bush, salt bush, horsebrush, and dalea. Grasses found in this community include rough tobosa, bush-muhly, and rice grass.

In the desert shrub area, moist years produce an exceptional understory of annual plants. The wide variety of small flowering plants include buckwheats, marigolds, mallows and desert poppy. Several species of annual grasses also occur in moist years.

2. Riparian and cliff vegetation is associated with the rocky canyon bottoms and walls of the escarpment, and consists of various plant species. Some of these are turbinella oak, manzinita, cliffrose, desert barberry, desert ceanothus, snowberry, apache plume, juniper, and pinyon pine. Ponderosa pine is found in the canyon bottoms. It is unusual to find Ponderosa pine at these low elevations in the Spring Mountains.

The deep, cool, well-watered canyons of the escarpment support vegetative life that is unique to the particular area. These canyons, especially Pine Creek Canyon, provide a micro-climate that supports plant species found only in the locality of the Spring Mountains. A list of these known plants includes: Abronia orbiculata, Astragalus tidestromii, Astragalus aequalis, Astragalus arrectus, Opuntia multigeniculata, Penstemon bicolor, Cordylanthus glandulosus, Corysantha rosea, Angelica scabrida, and Polyspichum scopulinum. In addition, horn wort, liver wort, and Draba spp. are found in Pine Creek Canyon. The fern Polyspichum scopulinum is not known to occur anywhere else in Nevada.

3. The higher elevation wooded land occurs generally to the west and north of the escarpment. This grouping is broken into subtypes only

3. The higher elevation wooded land occurs generally to the west and north of the escarpment. This grouping is broken into subtypes only for the purpose of showing a change in the density of overstory and understory plants. The overstory vegetation in the area consists of juniper and pinyon pine, which occur in varying densities. Predominant understory plants include blackbrush, silk tassel, manzanita, mountain mahogany, Joshua, banana yucca, mormon tea, sagebrush, snowberry, squawbush, wild currant, rabbitbrush, cliff-rose, yerba santa, agave, mortonia and oakbrush. The grasses found in this community include needlegrass, fluffgrass and ricegrass.

Geology

The formations exposed in the Red Rock area record over 500 million years of earth history. The oldest rock formation found in the area is the Goodsprings dolomite, whose fossil contents indicate that it may have been formed more than 500 million years ago during the Cambrian Period.

The fossil corals in the Goodsprings dolomite indicate that it was formed in a warm, shallow sea that once existed in the Las Vegas area. This inland sea persisted for almost 400 million years, and a thick series of marine limestones were deposited. The Sultan limestone, Monte Cristo limestone, Bird Spring formation, and the more recent Kaibab limestone of the Permian Period were all formed during the existence of this sea.

Toward the end of the Paleozoic Era the sea began to retreat, thus the character of the formations being deposited in the area changed. Subaerial deposition began and continued in the Mesozoic Era, with only one small break. Within the Moenkopi formation is a bed of marine limestone which represents a short-lived return of the sea. When the sea retreated, the shales and red sandstones were formed.

Subaerial deposition of red, cross-bedded sandstones continued throughout most of the Mesozoic Era. The Shinarump conglomerate, Chinle formation and Aztec sandstone were formed under these subaerial conditions.

The major Geologic feature of the Red Rock area is the escarpment. It is composed of Aztec sandstone formed by lithification of ancient sand dunes of the Jurassic Period. Broad sweeps of large scale cross-bedding have contributed to an intricate erosion pattern. Along the major escarpment, the Aztec sandstone is brick red in color. Erosional

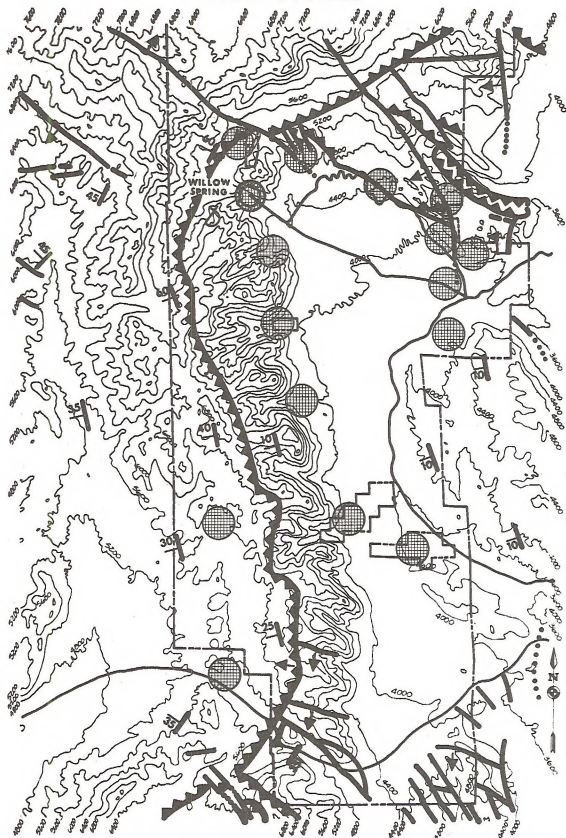
remnants of the Aztec sandstone comprise portions of the Calico Hills east of the escarpment. Here the sandstone has been leached to a variety of colors: lavender, orange, buff, and whitish gray.

At the foot of the escarpment the sediments of the Chinle formation (Triassic Period) are exposed. These soft, thin-bedded shales and sandstones form a brown and red slope leading from the escarpment to the valley floor where they are covered by alluvial terraces. Poor quality petrified wood and bone are found in the Chinle formation rather than clams and corals that characterized the limestones.

During the Mesozoic Era and continuing into the Cenozoic Era which began about 60 million years ago, southern Nevada experienced much tectonic and volcanic activity. Volcanic ash beds occur in some of the Mesozoic rocks, and lavas of Cenozoic age are common near the Red Rock area.

Tectonic activity in the form of faulting and earthquakes was common, and large masses of rock were moved great distances. A major fault, the Keystone thrust, is the most important structural feature of the Red Rock area. (See Fault System, Map #6, page 29). It is exposed for 20 miles along the crest of the escarpment. When the fault was active, thin-bedded, gray dolomites of the Goodsprings dolomite (Cambrian to Devonian Periods) were thrust atop the much younger Aztec sandstone as the thrust plate moved eastward along the length of the Keystone fault. The resistant cap formed by the Goodsprings dolomite has protected the top of the softer Aztec sandstone from erosion, thus forming a ridge crest. Erosion of the sandstone below the dolomite cap has created the Red Rock Escarpment.

FAULT SYSTEMS



LEGEND



DEVELOPMENT

 OVERTURNED BEDS

 STRIKE & DIP of BEDS

 FAULT LINE

 THRUST FAULT

 DIRECTION of DIP

 CONCEALED FAULT

MAP
NO.
6

In addition to the Keystone thrust fault, a number of smaller, normal faults and thrust plates have been mapped in the area. The Keystone thrust is offset by several younger faults, one of which is the LaMadre fault located north of Rocky Gap.

Since the time of tectonic activity, the area has been geologically quiet. Erosion continues to remove material from the cliffs and deposit the material in the washes below, as sand and gravel.

The Kaibab limestone formation (Permian Period) within the Red Rock area is known to have existing caves, with weak outer shells and inner structures. Some of these caves are living and are forming stalactites and stalagmites. Large areas of scree occur throughout the caves. Many caves have more than one level. Access to the caves can be easy or difficult, depending on the locations of the openings. Knowledge regarding the number and extent of caves in the area is limited.

AIR QUALITY

Air quality in the Red Rock area is good. The area lies at a higher elevation than the Las Vegas Metropolitan Area and is largely unaffected by this source of air pollution. As the Metropolitan Area grows, air pollution will increase significantly. It is expected that the air quality of the Red Rock area will be affected with a resultant degradation of the Air quality.

The major sources of air pollution in the Red Rock area are wind-blown dust, automobile emissions, and gypsum plant particulate matter. Wind-blown dust is the most noticeable. The main sources of the dust are from unpaved roads and trails and some unauthorized off road vehicle use.

Automobile emissions are most noticeable around the picnic areas during the summer and on week-ends.

The Flintkote plant is located to the southeast of the Red Rock area. It produces 1,800 pounds of gypsum dust per hour. This dust does not normally affect the Red Rocks. However, when the winds are from the southeast or east, some dust may be blown into the Red Rock area.

Air Quality Standards - The following are the air quality standards for the State of Nevada adopted by the Commission of Environmental Protection and approved by the Environmental Protection Agency.

The following air contaminant concentrations shall not be exceeded at any single point in the ambient air:

Sulfur oxides as sulfur dioxide

Annual arithmetic mean 60 $\mu\text{g}/\text{M}^3$ (.02 ppm)
Maximum 24 hour concentration 260 $\mu\text{g}/\text{M}^3$ (0.1 ppm)
Maximum 3 hour concentration 1,300 $\mu\text{g}/\text{M}^3$ (0.5 ppm)

Particulate matter

Annual geometric mean 60 $\mu\text{g}/\text{M}^3$
Maximum 24 hour concentration 150 $\mu\text{g}/\text{M}^3$

Carbon monoxide

Maximum 8 hour concentration 10,000 $\mu\text{g}/\text{M}^3$ (9.0 ppm)
Maximum 1 hour concentration 40,000 $\mu\text{g}/\text{M}^3$ (35.0 ppm)

Photochemical oxidant

Maximum 1 hour concentration 160 $\mu\text{g}/\text{M}^3$ (.08 ppm)

Hydrocarbons (non-methane fraction)

Maximum 3 hour concentration between
6:00 a.m. and 9:00 a.m. 160 $\mu\text{g}/\text{M}^3$ (0.24 ppm)

Nitrogen dioxide

Annual arithmetic mean 160 $\mu\text{g}/\text{M}^3$ (.05 ppm)

All values corrected to reference conditions.

Definitions:

$\mu\text{g}/\text{M}^3$ - micrograms per cubic meter
ppm - parts per million by volume

The Clark County Standards are as follows:

1. Smoke:

- a. No more than 10% light diminishment regardless of color.
- b. Motor vehicles shall not emit smoke while moving for a distance of more than 100 yards.

2. Fugitive Dust:

Must not create a hazard and must not cross property lines.

3. Particulate Matter:

0.00407 lbs./hr. per 10 lbs. of refuse burned.

0.046 lbs./hr. per 10 lbs. of material processed by an industry.

4. Sulfur Dioxide:

150 lbs. per billion BTU/hr. Applicable to power generating plants.

Air movement, wind direction and intensities are discussed under the section on climate. The "Dames and More, Joint Meteorological Report" prepared for five southwest power generating stations, dated September 1, 1971, indicates that the Red Rock area is on the western border of a very large air shed including southern Nevada, southwest Utah, and northwest Arizona.

The extent of the air shed depends on meteorological parameters such as wind speed and direction, turbulence, temperature, general movement of air masses and topography.

The following tables from the Clark County District Health Department indicate the thickness and occurrence of air inversions in the Las Vegas air shed which is adjacent to the Red Rock area.

DISTRICT HEALTH DEPARTMENT, CLARK COUNTY
Air Pollution Control Division

SURFACE INVERSION OCCURRENCE
October 1964 - September 1966, Incl.
Las Vegas, Nevada

Month	<u>By Month</u>	<u>By Height</u>	
	Occurrence % Days	Inversion Thickness, Ft.	Occurrence % Days
January	87	200	0.3
February	80	300	21.2
March	85	400	7.5
April	79	500	4.5
May	74	600	5.4
June	90	700	6.5
July	85	800	7.4
August	88	900	5.3
September	86	1000	4.6
October	92	1100	5.2
November	86	1200	3.9
December	83	1300	1.5
All Months	84	1400	2.8
		1500	1.0
		1600	1.7
NOTE: Computed from meteorological		1700	1.5
soundings furnished by U.S. Weather		1800	1.0
Bureau Station, McCarran Airport,		1900	0.7
Las Vegas, Nevada		2000	0.1
		over 2000	
		1500 & less	

LOW-LEVEL (BELOW 500 FT.) INVERSION CLOUD COVER
AND SURFACE WIND OCCURRENCE, LAS VEGAS, NEV.

(Extracted from Monthly Weather Review,
Vol. 89, September 1961, pp. 319-339.)

1. Percent of total hours of inversion (2-year period--1957-59)

Winter	54
Spring	39
Summer	37
Fall	50
Annual	45

2. Percent frequency of days with nocturnal inversions (2-year period, 1957-59)

Winter	92
Spring	86
Summer	89
Fall	90
Annual	89

3. Percent of night-time hours with cloud cover 3/10 or less (5-year period)

Winter	60+
Spring	70
Summer	80+
Fall	80+
Annual	70+

4. Percent of night-time hours with wind speed 7 MPH or less (5-year period)

Winter	80+
Spring	80+
Summer	90
Fall	90
Annual	80+

5. Percent of night-time hours with cloud cover 3/10 or less and wind speed 7 MPH or less (5-year period)

Winter	70
Spring	70
Summer	70+
Fall	80+
Annual	70+

This information indicates the most critical month for air inversions is February.

Testimony of R. J. Fiorio, the Assistant Director of the Air Pollution Control Division of the Clark County Nevada Health Department, indicates the following for the Las Vegas Valley:

1. Topographic features aggravate atmospheric pollution problems. Atmospheric inversion conditions exist for about 3600 hours per year. These occur most frequently between November and January.
2. Indications are that 50% of the surface inversions occur at mixing heights of 700 feet or lower from ground level. This means that at least 50% of the time during the year, the surface inversion height is 700 feet or less.
3. The inversion level with respect to the ground determines total volume of air that is available for mixing with the pollutant being generated at the surface. As the volume of air for mixing decreases, the concentration of pollutants in the ambient air will increase.
4. Generally in the absence of daylight cloud cover, the surface inversion burns off as the valley floor heats up and the trapping layer of warm air is thus eliminated to ventilate pollutant concentrations to the upper atmosphere.
5. Air inversions occur almost 90% of the time on an annual daily basis. Relatively stagnant wind conditions occur over a high percentage of the time. These conditions are normally offset by solar heating during the day which raises or dissipates the inversion. Wind speed normally increases at that time, which provides lateral dispersion of the pollutants. Emergency conditions from an air pollution

standpoint can arise if the more highly dispersive conditions do not occur on a daily cycle and stagnant conditions persist for two to three days or longer. These figures and statements refer to the Las Vegas Valley. The Red Rock area lies at a higher elevation and does not suffer from the lower elevation air pollution of the Las Vegas Valley. However, it is adjacent to the valley and could contribute to the overall pollution problem.

Sewage Treatment

The BLM has installed one set of vault toilets near Willow Springs. The effluent from these vaults is removed by commercial firm and disposed in the city in Las Vegas sewage system. However, the Valley has some serious problems concerning sewage treatment. An Environmental Assessment Pollution Abatement Project, Las Vegas Wash and Bay report prepared by VTN Nevada and Jones and Stokes Associates, Inc., for the Las Vegas Valley Water District dated August 1, 1972, states the problem as follows:

"For many years, municipal and industrial wastes from the Las Vegas Valley have been discharged into Las Vegas Wash, polluting Lake Mead and the Colorado River downstream, in violation of interstate water quality standards. The wastes derive from a multitude of sources: secondary treated effluent from the City of Las Vegas sewage treatment plant; inadequately treated secondary effluent from the presently overloaded Clark County Sanitation District sewage treatment plant; highly saline cooling water from two power plants; highly industrial wastes from the Basic Management, Inc. (BMI) complex, inadequately treated secondary effluent from the City of Henderson sewage treatment plant; and agricultural irrigation, domestic irrigation, and septic tank return flows.

When the wastes enter Lake Mead, algae feed on nutrients and form unsightly and odorous blooms in the Las Vegas Bay of the lake. The dissolved solids (salts) in the water (some 400 tons each day) mix in the lake and eventually flow downstream to water users in Arizona, California, and Mexico.

On December 23, 1971, the United States Environmental Protection Agency (EPA) instituted a 180-day enforcement action against the major polluting governmental agencies and industries. EPA presented evidence at a hearing on January 25, 1972, documenting the sources of the discharges and the violations of interstate water quality standards for Lake Mead and the Colorado River. Recognizing that proper planning was required to accomplish a solution, the 180-day enforcement action requires that a workable solution (or solutions) be scheduled and submitted to EPA for approval. If approved schedules are not kept, or are inadequate, the United States Attorney General may obtain a court order prohibiting further discharges. Violations of such an order would constitute contempt of court, and would be punishable by fine, prison sentence, or both.

In a separate action, the Nevada Legislature enacted a statute effective July 1, 1973, the practical application of which prohibits the construction of new subdivisions when their sewage would violate water quality standards after treatment. Present effluent from the City of Las Vegas and Clark County Sanitation District treatment plants serving the Las Vegas Valley does not meet State of Nevada discharge standards which will become effective in July, 1973. The treatment processes which would be needed to meet these standards are not now planned to be added by either of these agencies."

Wildlife

There is no comprehensive inventory of the animal life in the Red Rocks area. A study recently completed by the Biology Staff of Nevada Southern University, on the "Natural History of Pine Creek Canyon," provides a good insight into the biotic community of that area. Fish life is nonexistent.

The Spring Mountain Range, of which Red Rocks is a part, is isolated by intervening deserts. Isolation has resulted in speciation which has produced one endemic chipmunk (Eutamias palmeri), a few endemic subspecies of other mammals, and several endemic plant species (Bradley and Deacon 1965).

There are several game species in the Red Rocks area, including desert bighorn sheep, elk, deer, rabbits, and quail. The area is considered an important desert bighorn sheep range. Deer are present in the area but are much more abundant in the higher elevations of the Spring Mountains. Elk occasionally migrate into the area but in very small numbers.

Typical of most desert environments, the greatest wildlife activity is during the night hours. The greatest variety of wildlife species is present near permanent water supplies. Opportunities for observation of the desert wildlife are, consequently, greatest during the night time near water sources.

Animals, by species, are listed and discussed below. Due to their importance, rare and/or endangered species are identified separately.

1. Amphibians and Reptiles

The species of amphibians found in the area are concentrated around water sources. Their existence is dependent upon maintaining the small springs, streams, and riparian vegetation.

Reptiles are dependent upon the existence of native vegetation and an unaltered habitat.

The following amphibians and reptiles have been identified in the area:

Pacific Tree Frog
Red-Spotted Toad
Banded Gecko
Island Night Lizard
Chuckwalla
Desert Iguana
Zebra Tailed Lizard
Leopard Lizard
Collared Lizard
Desert Spiny Lizard
Tree Lizard
Long-Tailed Brush Lizard
Side-Blotched Lizard
Desert Horned Lizard
Western Whiptail Lizard
Western Blind Snake
Spotted Leaf-Nosed Snake
Striped Whipsnake
Coachwhip
Western Patch-Nosed Snake
Gopher Snake
Glossy Snake
Common King Snake
Long-Nosed Snake
Western Ground Snake
Western Shovel-Nosed Snake
Night Snake
Sonora Lyre Snake
Sidewinder
Speckled Rattlesnake
Mohave Rattlesnake
Gila Monster
Desert Tortoise

2. Mammals

Both big game and small game species as well as smaller fur bearers and rodents are found in the area. The two big game species are discussed in detail.

a. Mule Deer

Habitat within the Red Rocks area is marginal for deer. A small local population of deer inhabits the area. Some increased winter use occurs in La Madre Canyon area by deer summering in the higher altitudes of U. S. Forest Service lands. Mule deer are not present in sufficient numbers to excessively use the key browse species. All available deer habitat is winter range type; thus, mule deer production will not greatly increase. Important habitat needs for the mule deer in the area are provided by three springs:

La Madre Spring - NW1/4, Sec. 29, T. 20 S., R. 58 E.;

Unnamed Spring, SE1/4SE1/4, Sec. 36, T. 20 S., R. 58 E.;

Lower Springback Spring, SW1/4SW1/4, Sec. 7, T. 21 S.,
R. 58 E.

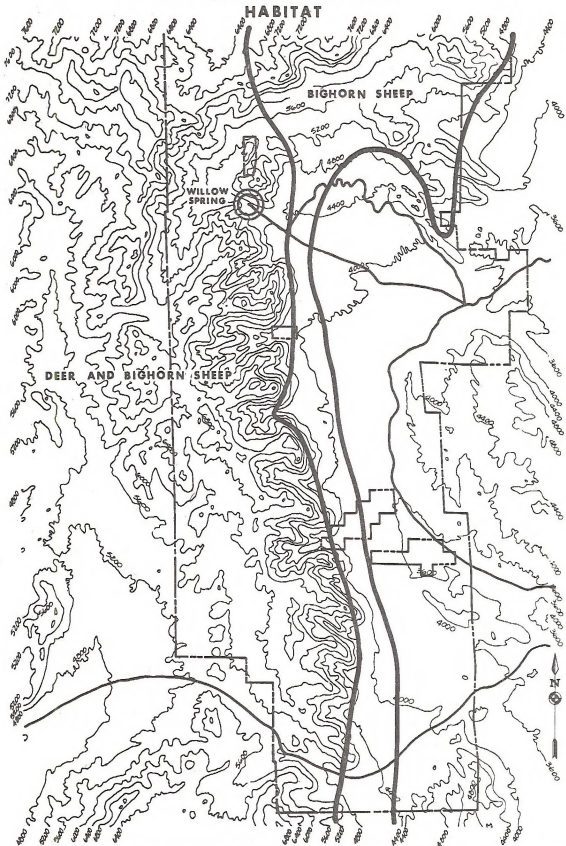
(See Habitat Map, page 43).

b. Desert Bighorn

Nevada Department of Fish and Game has estimated the desert bighorn population to be approximately 200 animals in the Charleston Peak area and approximately 100 animals in the Potosi and Bird Range area. These two estimates include the Red Rock Recreation Lands.

Bighorn become critically dependent upon free water sources during the late spring and summer months. April

DEER AND BIGHORN SHEEP HABITAT



LEGEND

MAP
NO.
7

and May are often critical if green succulent feeds are not available. Summer rains usually occur sporadically during June, July and August. Immediately following such rains, bighorn are independent of springs and permanent waters. Reasons for this are twofold: (1) green succulent feed is available, and (2) free water is available throughout most ranges (particularly sandstone formations) in natural collecting basins. Duration of this free ranging period is, of course, dependent on amount and duration of precipitation, but normally does not exceed two weeks because of temperature and wind. At other times during the spring, summer, and early fall, bighorn activities are closely associated with permanent waters and they seldom range more than a mile or two away.

The Red Rock escarpment and Sandstone Quarry contain numerous natural water collecting basins. These contain adequate water during summer months when precipitation occurs. Several springs have become unavailable to bighorn because of man's picnicking and camping activities at Rocky Gap, Red Spring, and to a lesser extent, Pine Creek.

Bighorn use of the Calico Basin and Brownstone areas is almost completely dependent on two reservoirs constructed by the C.C.C. (SW1/4NE1/4, Sec. 25, and Sandstone Reservoir located in SW1/4SW1/4, Sec. 12, T. 20 S., R. 58 E.).

No known permanent waters exist in the eastern La Madre Mountains. Bighorn use, therefore, is restricted to winter,

early spring and late fall.

Key yearlong bighorn habitat totals about 22,000 acres in the Red Rock Canyon Recreation Lands. About one half of this is located along the southern exposure of La Madre Range. The remaining key yearlong area consists of the Red Rock escarpment. Although the Sandstone escarpment area is well watered, forage conditions are poor for bighorn sheep.

Other mammals in the area are:

Pallid Bat
Long-Eared Bat
Big Brown Bat
California Myotis
Western Pipistrelle
Big Free-Tailed Bat
Antelope Ground Squirrel
Round-Tailed Ground Squirrel
Rock Squirrel
Palmer Chipmunk - known only from Spring Mountain
and sheep ranges of Clark County,
Nevada
Botta Pocket Gopher
Merriam Kangaroo Rat
Desert Kangaroo Rat
Little Pocket Mouse
Desert Wood Rat
Canyon Mouse
Cactus Mouse
Deer Mouse
Pinyon Mouse
Porcupine
Black-Tailed Jackrabbit
Audubon Cottontail
Nuttall Cottontail
Coyote
Gray Fox
Kit Fox
Ring-Tailed Cat
Spotted Skunk
Badger
Bobcat

3. Birds

A great variety of bird life occurs in the area.

Gambel's quail are found in the lower escarpment wherever there is water and adequate escape cover.

Mourning dove have been found nesting in the area. Water distribution is more than adequate for the mobile dove. Annual plant seed production is its source of food. Nesting and loafing cover is generally lacking at the lower elevations. Doves prefer large trees, particularly those with broad surfaces of dense branches, crotches or large limbs for nesting sites.

The following list identifies species of birds in the Red Rock area.

Turkey Vulture
Red-Tailed Hawk
Cooper's Hawk
Sparrow Hawk
Sharp-Shinned Hawk
Prairie Falcon
Golden Eagle
Gambel's Quail
Mourning Dove
Long-Eared Owl
Saw-Whet Owl
Great-Horned Owl
Screech Owl
Lesser Nighthawk
Common Nighthawk
Poor-Will
White-Throated Swift
Costa's Hummingbird
Broad-Tailed Hummingbird
Red-Shafted Flicker
Ladder-Backed Woodpecker
Yellow-Bellied Sapsucker
Ash-Throated Flycatcher
Vermillion Flycatcher
Say's Phoebe
Cliff Swallow

Rough Winged Swallow
Scrub Jay
Common Crow
Common Raven
Pinon Jay
Plain Titmouse
Mountain Chickadee
Common Bushtit
Cactus Wren
Rock Wren
House Wren
Sage Thrasher
LeConte's Thrasher
Mountain Bluebird
Western Bluebird
Blue-Gray Gnatcatcher
Ruby Crowned Kinglet
Loggerhead Shrike
Solitary Vireo
Black-Throated Gray Warbler
Wilson's Warbler
Scott's Oriole
Western Tanager
Hepatic Tanager
Sage Sparrow
Black-Throated Sparrow
House Finch
Oregon Junco
Rufous Sided Towhee
Chipping Sparrow
White-Crowned Sparrow
Cardinal

4. Rare or Endangered Species

a. Prairie Falcon

Falcons have been seen in the Red Rocks area during their breeding season, though no nests or nesting areas have been verified. Nesting sites, if existing, would be found in the escarpment areas.

b. Desert Tortoise

This species is restricted to the creosote and open lower black brush communities (low elevation--eastern portion of the Red Rocks).

c. Gila Monster

This is the rarest Mohave Desert reptile. Only nine recordings are known in Nevada. This large reptile inhabits major drainage systems of the Colorado River. No specific habitat areas are known for the gila monster, due to its limited number and lack of an intensive census.

5. Future environment without the proposal

With the upper area west and north of the escarpment allowed to continue its natural succession, wildlife should continue to utilize the area. The recent action to close the back area roads will aid significantly in allowing wildlife free use of the area and access to natural waters.

With increased people pressure that is developing, wildlife will slowly give way to human encroachment and probably move back further from all access points and major use areas. Tighter herd management techniques would be necessary to maintain big game, dove and quail populations.

Free Roaming Burros

A small herd of wild burros range in the northern part of the Red Rocks Canyon through the La Madre Mountains. Since the fall of 1972, this herd has been watering at Calico and Ash Springs. The principal browse species are: Ambrosia dumosa (white bursage) and Ephedra nevadensis (Mormon tea). Burros do have a preference for grasses and forbs when they are available.

Burros originated in the arid desert plains of northeastern

Africa and, therefore, are well suited to survival in a desert environment. Burros are very efficient foragers and do well under marginal forage conditions. Their general success in competing with wildlife for forage, space and water indicates that in many cases their adaptability is superior. Feral burros have a long breeding season and breed every year. They bear only a single colt. Their only natural predator is the mountain lion which isn't found in the Red Rock Canyon area. (Source: California Department of Fish and Game.)

Not enough information is known on the Red Rock Canyon burro herd to project the environmental situation in the future. General information on burro populations indicates that burros can place heavy pressure on the range. High populations have seriously depleted or completely destroyed the range--not only for others but for themselves as well (California Department of Fish and Game).

Livestock

The Red Rock Canyon Recreation Lands are within the Spring Mountain Grazing Allotment. Livestock privileges have been adjudicated, based on ownership or control of water (base water).

The allotment boundaries encompass 301,720 acres which are classified as ephemeral range. This means that livestock grazing is dependent on annual plants which grow following summer rains. Livestock grazing, therefore, is not an annual use, but occurs only during years of good moisture conditions. The last grazing use occurred six years ago (1967) when 250 cattle grazed from October through February.

The base waters, to which the grazing privileges in the Spring Mountain Allotment are attached, have recently changed

ownership. These waters have, in the past, been appropriated under Nevada State Water Law, and have been legally transferred to the new owner, who has filed application with BLM for transfer of the grazing privilege.

The former livestock operator had verbally agreed not to graze cattle east of the Red Rock escarpment and north of the Bar Nothing Ranch. This area contained about 26,000 acres and an estimated 320 Animal Unit Months ^{1/} of forage under favorable moisture conditions. No such agreement exists with the present owner of the base waters for the Spring Mountain Allotment.

Range improvements constructed in past years to facilitate livestock management include fencing and spring developments. These have been financed and constructed by the operator in some instances, and by cooperative agreement with BLM in others.

Increased visitation by recreationists in recent years, vandalism of livestock waters and developments, and rustling were factors which brought about the past verbal agreement resulting in non-grazing use on a portion of the allotment east of the escarpment. In addition, lack of fencing along the Blue Diamond Road and other access routes not only posed safety hazards, but resulted in livestock deaths by vehicle collision. Many of the base livestock waters owned by the present operator are heavily used by the public in recreational

^{1/} The amount of forage which is necessary to sustain one animal unit (one cow or one horse or five sheep) for a period of one month.

pursuits.

The Red Rock Canyon Recreation Lands are not now closed to livestock grazing, and are presently subject to application to activate grazing use commensurate with available livestock forage.

Watershed

The Red Rock Canyon Recreation area is made up of two watersheds. One watershed drains eastward to Las Vegas Valley - two ephemeral streams, Red Rock Wash and Cottonwood Creek, transport the infrequent flood flows from the watershed. The other watershed drains southward to Pahrump Valley through Lovell Canyon. The two watersheds are separated by the Red Rock escarpment and are approximately equal in area.

The watershed east from the crest of the escarpment to the edge of the valley floor is protected from erosion by massive sandstone formations that are cut by steep narrow canyons with accumulations of sediments gathered over long periods of time. Some of the canyons have springs in them. These drainages make their way across the valley and eventually join one of the two streams that drain the area. Much of the surface water that flows through these streams and washes is lost by infiltration into the ground or through evaporation. The hydrologic cover for this drainage is good because much of the area is protected from the elements by bedrock, rock fragments, vegetation and litter, with a comparatively small portion of the area being bare ground.

West of the escarpment the watershed lays on a west facing slope protected by dolomite bedrock, covered by coarse grained, shallow soils, rock fragments, vegetation and litter. Precipitation infiltrates into the soil quite rapidly in this area. This water is then generally lost through evapotranspiration and only infrequently does the surface water leave the watershed.

The erosion condition class, considering both watersheds as a whole, is considered moderate to slight, although there are critical erosion areas at specific locations within the watersheds that must be recognized.

Minerals

The Spring Mountain Multiple Use Classification segregated the Red Rock Canyon Recreation Lands from the general mining laws on November 10, 1966. This segregation was made subject to valid existing rights. Minerals under the mineral leasing laws were not affected. No mineral material sales were authorized in the area.

Mineral investigations are being made to determine the validity of the claims that exist in the area. The status of these claims is as follows:

1. Areas Cleared of Claims

Willow Springs

Sandstone Quarry

Calico Spring

2. Areas in which Claims have been Investigated and Contest

Recommended, but which have not gone to Contest as yet

Oak Creek (Hassett Group - 10 claims, and Rhea Group - 7 claims)

Other claims exist in this area, but have not been investigated (see below)

3. Areas in which Claims Exist but which have not been

Investigated

Brownstone Reservoir 2 claims

LaMadre Springs 6 claims

Ash Springs 2 claims

Red Springs 2 claims

Mescal Pits 3 claims

Pine Creek 3 claims

Oak Creek 20 claims

First Creek 5 claims

Rainbow Springs 3 claims

Mud Springs 3 claims

Moonshine Springs 2 claims

Shovel Springs 9 claims

4. Areas in which no Claims were Found

White Rock Springs

Blue Diamond Administrative Site

Lost Creek

Icebox Canyon

Lone Pine

Switchback Springs

Most of the claims located in the area are for building or decorative stone (Aztec Sandstone and Shinarump Conglomerates). Several locators also list uranium among the minerals located. Uranium does occur in the Shinarump Conglomerate in Arizona and Utah, but no production from the Shinarump in Nevada has been reported. Where claims have been investigated for uranium, the radioactivity measurements have not exceeded normal background levels.

No other locatable deposits are known to occur in the area. Sand and gravel deposits do occur in portions of the area but these are no longer locatable or open to material sales.

Recreation

The Red Rock Canyon Recreation Lands are one of the most outstanding attractions in the State of Nevada. This is verified by the fact that an estimated 600,000 persons visited the area in 1972. The recreation opportunities are described in other parts of this section. (See sections on geology, vegetation, wildlife, climate, topography, antiquities, visual, wild burro, etc.) The primary resource value in the area is the spectacular multi-colored sandstone escarpment. Other resource values of major importance are the unique vegetation and animal life and the numerous archeological sites.

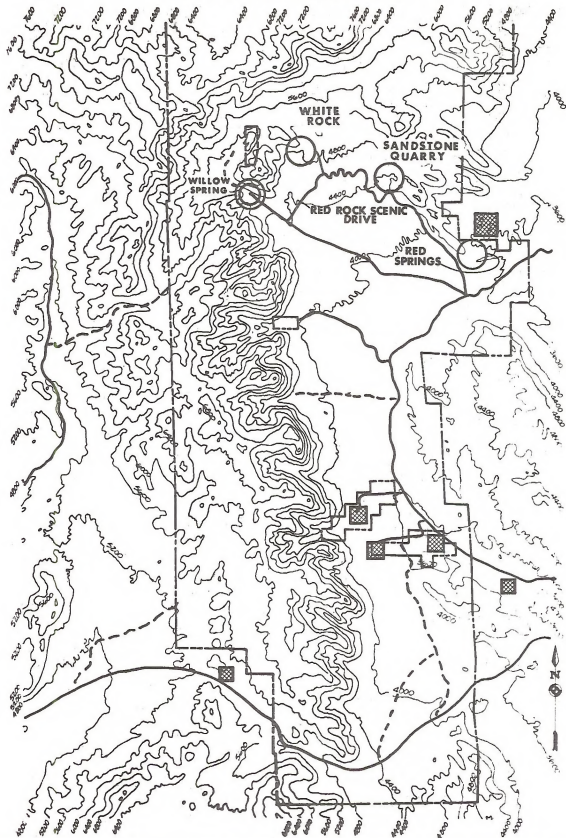
The Red Rocks offer another unique contribution to regional recreation opportunities with desert and high elevation areas within a relatively compact management area. No developed areas

offer the same variety of recreational environments. The area provides both desert and high elevation recreation at shorter driving distances and more importantly, at the same general destination. The variety permits the area to be used by recreationists during all seasons. The close proximity to the City of Las Vegas is a drawing card to the area.

Recreation use in the area is limited by a lack of facilities. The major recreation developments include Segment A of the Red Rocks Scenic Drive and Willow Springs, a small picnic site. White Rock, Sandstone Quarry and Rock Springs sites have parking and litter collection facilities. See Map #8, page 56. There are numerous jeep trails throughout lower elevations and on the western slopes at the high elevations. This tends to encourage indiscriminate use by 4-wheel drive operators and motorcyclists. A few livestock and game trails within the escarpment provide limited access for hikers.

Two visitor use studies have been completed in the area; one in 1967 and the other in 1969. Both studies were based on limited data; however, the 1969 study included considerable data collected within the area. The 1967 study estimated total visitor use at 190,000. This increased to 370,000 visits according to the 1969 study and it has been estimated at 600,000 annual visits during 1972. The studies were inconclusive on the breakdown of this use, but these show that the vast majority (possibly 90%) is sightseeing from an automobile while traveling Blue Diamond Road or other roads in the area. Other uses of significance

EXISTING DEVELOPMENTS



CAMP or PICNIC
DEVELOPMENT



ALL WEATHER ROAD

LEGEND



RESIDENTIAL



ORV TRAIL

MAP
NO.
8

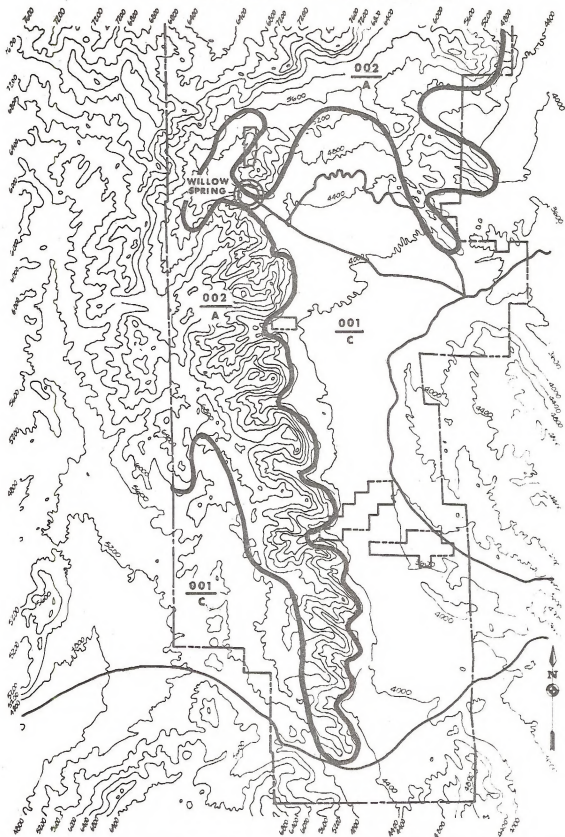
include: hunting for bighorn sheep, deer and quail, picnicking, hiking, mountain climbing, horseback riding, target practice (bow and arrow, and gun) and camping. Camping use is very low. It is believed this is attributable to the lack of facilities and the proximity to Las Vegas. The use in the Red Rocks area is overwhelmingly of the "day use" variety. The 1969 study indicated that 75% of the users stayed less than 4 hours.

Assuming that these estimates are reasonably correct, there has been over a 300% increase in visitor use since 1967. During this period the only significant improvement has been the development of Segment A of the Red Rock Scenic Drive. Use of Segment A has been very light due to the dust problem, etc., associated with the gravel surface. It is anticipated that there will continue to be a significant increase in use at the Red Rocks which could create significant resource damage and a visitor management or control problem.

Primitive

Areas of high primitive value in the Red Rocks are depicted on Map #9, page 58. The high primitive values are generally restricted to the sandstone formations. The remainder of the area is honeycombed with roads, trails, buildings, and other structures which tend to reduce the primitive value. The primitive values shown on Map #9 were derived by applying the Bureau of Land Management's primitive value rating procedure. This system rates an outstanding primitive area with a value of "A", "B" is moderate, and where there are low primitive

PRIMITIVE QUALITY EVALUATION



000 - RATING AREA

LEGEND

A - QUALITY OF AREA -
SCALE A, B, C

MAP
NO.

9

values, the rating would be "C".

Timber

The only major timber type found in the area is a woodland type, consisting of pinyon-juniper. This forest is located on the upper escarpment west of the sandstone formation. This timber has potential for Christmas trees, fence posts, firewood, pinyon nuts and aesthetical greenery. Gathering pinyon nuts is the only activity presently being pursued. Patches of ponderosa pine are located in the higher elevations and in isolated deep canyon bottoms. The Ponderosa Pine type found in the isolated environment of the Pine Creek vicinity helps support the protective withdrawal for a natural area. Another area having potential for designation as a natural area because of its timber type is the Lone Pine area on the upper escarpment.

URBAN-SUBURBAN

Access to the Las Vegas area is excellent. The city is served by eight major airlines, one major railroad, and four major bus lines. Interstate 15 provides highway access from the southern California area (284 miles to Los Angeles) and from the northeast (450 miles to Salt Lake City). U. S. Highway 93 provides access to the north and southeast. U. S. Highway 95 provides access to the northwest and south. Access from Las Vegas to the Red Rocks area is provided via Charleston Blvd. and the Blue Diamond Road.

Natural gas, water, sewer service, electricity, and telephone are all available in the City of Las Vegas. Electricity and telephone services are provided to the Calico Basin area immediately east of the Red Rocks. Water is developed on site at Calico Basin and sewage disposal is by use of septic tanks. Power and telephone utilities have been extended within the park boundaries to the Bonnie Springs Ranch and the Bar Nothing Ranch. Solid waste disposal in the Las Vegas Valley is provided by four major disposal areas. Only one of these areas is being operated at standards that meet EPA requirements. A serious littering problem exists on the vacant land surrounding the developed area of the city and it is especially noticeable along access routes to the Red Rock area. Trash collected at the recreation site at Rocky Gap is presently hauled to the Blue Diamond dump which is administered by Clark County.

The pattern of land ownership from the center of the Las Vegas Valley extending westward to the Red Rocks starts as almost solidly blocked private ownership in the Valley center, thence turning into a fragmented public-private land ownership on the western frontage of the city limits. This fragmented land pattern continues to the Red Rocks southwest boundary

in the vicinity of Blue Diamond. To the north, however, the fragmented land pattern extending west on Charleston Blvd. becomes another solid block of private ownership that continues to the east boundary of the Red Rock area and also includes the large block of private land within the boundary south of Calico Basin. The fragmented land pattern lying east of the Red Rock area is generally the remnants of Small Tract Act activities during the 1950's and early 1960's. These are generally 2-1/2 acre to 5 acre parcels on which scattered development is occurring for residential uses.

The large block of private land that extends westward from Calico Basin is owned by the Hughes Tool Company. No plans are presently known for future development of this land. Present growth trends of Las Vegas Valley indicate a northwest and western trend of expansion.

Within the boundary of the Red Rock Canyon Recreation Lands are several private inholdings other than those mentioned in the vicinity of Calico Basin. These include 80 acres at the mouth of Pine Creek which presently has two dwellings and a horse corral. The Bar Nothing Ranch containing approximately 520 acres has several permanent residences, reservoirs, and livestock pastures. The owners of this land plan to construct and maintain an equestrian oriented planned development unit consisting of 387 one-acre lots, 175 one-half acre lots, 117 townhouse units, and 90 condominium units. Also, recreation areas including a three acre lake, 9-hole golf course, an equestrian center, and 10.7 miles of bridle trail. This proposed development would be contingent on approval of a zone change from R-U (rural open land) to R-E (rural estates).

Adjacent to the Bar Nothing Ranch is the Bonnie Springs Ranch containing 120 acres. Developments here include a park, restaurant, riding stable and other developments associated with a dude ranch operation. The owner of the Bonnie Springs Ranch is currently in the process of constructing a western village which will be used as an attraction in conjunction with his other operations. These developments occur entirely on private land. The Oliver Ranch immediately east of the Bonnie Springs Ranch is the last private inholding and contains approximately 320 acres of private land. Development here is generally restricted to a residence.

The Calico Basin area is presently the site of residential construction. This was an old Small Tract disposal area and, with the availability of power and telephone utilities, construction of rural type homes is taking place. There are about 12 homes now.

Lands to the north, west, and south of the Red Rock area are basically unoccupied national resource lands being used for recreation, limited livestock grazing, hunting, and off-road vehicle use. An exception is the Mountain Springs residential community.

In the past, land in the Las Vegas Valley has been developed in a haphazard manner. One area may be subdivided and developed, but the next area to be developed will be 3-4 blocks or more from the nearest developed subdivision. A "leap-frogging" type of development has been the pattern in this area. This has created problems and additional expense for local governments in providing such services as sewers, water, police protection, fire protection, and busing of school children. Public utilities have problems providing power and telephone service. The rapid growth in Las Vegas has been anything but orderly.

A 1965 study entitled "Economic Growth in Public Land Planning in the Las Vegas Valley" conducted by Gerard H. Rostvold states that the geographic pattern of urbanization in the Las Vegas Valley planning area, between 1964 and 1980, will not create extensive pressures to release public lands for orderly commercial development. Pressures for the release of public lands will be motivated by speculative considerations during this period. Dr. Rostvold further states, "Bureau of Land Management operations should be directed toward an orderly transfer of lands within the fragmented area of private ownership." There are many undeveloped tracts of private land (very little Federal, except in unincorporated county areas in the valley) within the corporate city limits of North Las Vegas and the City of Las Vegas.

CULTURAL ENVIRONMENT

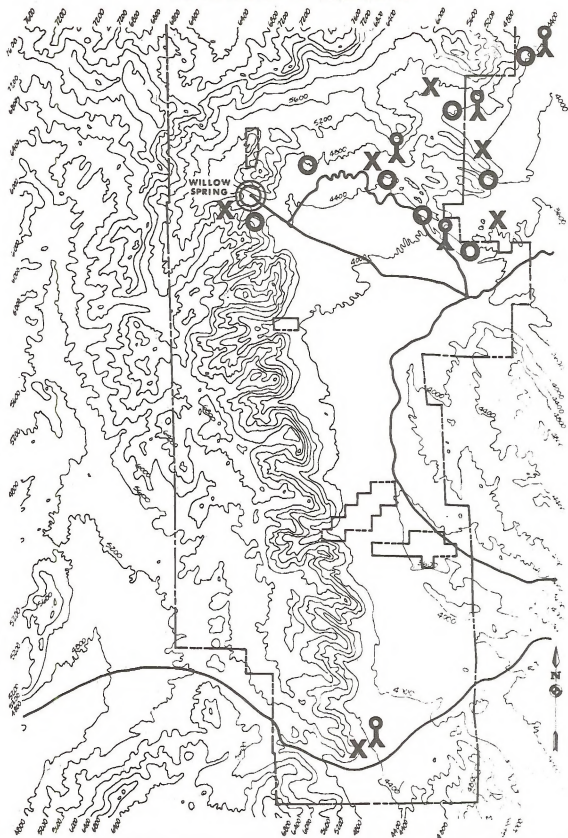
This section deals with several categories, each of which influence and have a direct bearing on the present and potential uses of the lands under consideration. Four broad categories will be discussed separately. However, they are all interrelated and must be considered collectively to form a true picture of the relationship of the area to Las Vegas Valley and the immediate regional area.

Antiquities

Man has occupied the region for at least 10,000 years, and perhaps longer. Gypsum Cave, near Las Vegas, has provided evidence of a big game hunting culture at about 9,000 B.C. Other hunting and gathering peoples, represented by Pinto Basin points, were in the region in pre-Christian times. Although these people have not been specifically identified in the Red Rock area, there is good indication that they were there. A complete inventory of the area is needed (see Map No. 10, page 65, for existing inventory data).

At about the time of Christ, a hunting-gathering type culture was prevalent in the region. It was related to the general basket maker culture spread over much of the southwest at this period. The culture acquired maize, beans, and squash over time and settled down to a sedentary way of life until dispersed in the late 1100's. The people of this culture were centered on the lower Virgin and Muddy Rivers, living at first in pit houses and later in Pueblo style surface dwellings. Although basically farmers, these people also hunted game and gathered mesal (agave) far and wide. One of their use areas was the Red Rock area, as indicated by pottery, mesal pits, campsites, and possibly pit houses.

HISTORICAL & CULTURAL



MESCAL PITS



CAMP SITES

LEGEND



PETROGLYPHS or PICTOGRAPHS

MAP

NO.

10

Sometime after 700 A.D., the southern Paiute entered the area. They were distantly related to the people carrying the Pueblo culture of the Virgin and Muddy Rivers, as some aspects of their life-ways were quite similar. They also traded among themselves.

The Paiutes were a gathering people doing some hunting, and practicing an insipid agriculture. They used some of the same mesal pits, campsites, and areas as did the Pueblos. They also used windbreaks of brush and caves for semi-permanent dwellings. During the winter they gathered at specific village locations for social and religious rites. There are indications, through pottery mainly, of contacts in prehistoric times by both the Pueblos and the Paiutes with people to the south, people ancestral to the present-day Mohave, Yuma, Walapai, and others. In historic times we have accounts of Mohave raids into the area for plunder and slaves.

In historic times the Spanish, Mexicans, Mountain Men, and Mormon pioneers all passed through the region via the trail over Spring Mountain Pass. They left little evidence of their passing, however. Only the cattlemen settled in the valley below the escarpment.

The archeological resources have been well inventoried in the northern end of the Red Rocks, especially Brownstone Canyon, Sandstone Quarry, Lost Creek, Willow Spring, Calico Springs and Ice Box Canyon (see Map No. 10, page 65). Sites may be expected wherever there is water in the surrounding uninventoried area. There is little known about the archeological values in the south and eastern portion of the area.

Pot robbing and vandalism is a serious problem at many of the archeological sites. At the present rate of growth in visitor use, and without a management and protection program, most of the aesthetic and scientific values of these sites could be destroyed within a few years.

Aesthetics

Visual:

Natural beauty results from an interesting and homogeneous variety of line, form, color and texture. Red Rocks has a superb combination of these factors. Line is dramatically portrayed in the horizontal (flat) valley floor versus the vertical sheer cliff formations. Likewise, the lack of form on the valley floor tends to magnify the visual impact of the wedge shaped canyons and at the higher elevations the rounded forms of the sandstone formations. The many colored bands in the cliffs contrast with the grey-greens on the valley floor, the green belt along the stream beds, and the pine forests on the north slopes at the higher elevations. The contrasting textures created by the desert vegetation in the valley, the talus slopes, the undulant sandstone formation, and the change in soil texture and vegetation on the formation overlaying the sandstone gives excellent variety to this scenic component.

Viewing the area from the valley floor, the eye is attracted to the sudden thrust of the red shaded rock through the desert floor. The formations rise 3000 feet above the viewer and the setting against the deep blue sky makes an awe-inspiring sight. From the upper edge of the escarpment, the rugged beauty of the Red Rock escarpment can be seen. Also, the viewer has a panoramic view of the desert floor and of Las Vegas in the distance. A night view of Las Vegas is very enchanting.

In terms of offering a variety of inspiring visual experiences, Red Rocks is one of the outstanding natural areas in the southwest.

Using the Bureau's quality evaluation rating system, the area was rated for scenic beauty (see Map No. 11, page 69). An "A" rating indicates the area which has outstanding scenic value, a "B" rating is moderate, and a "C" rating indicates low scenic value.

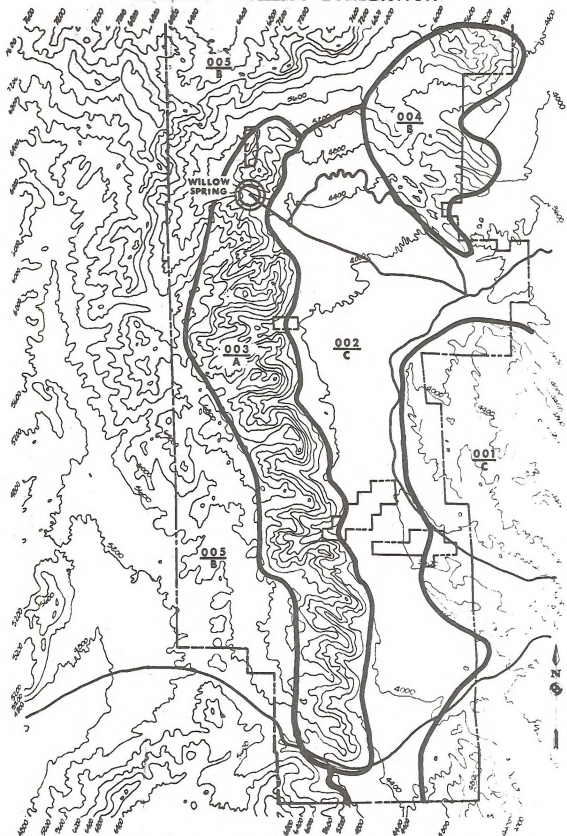
The overall scenic values will not be affected appreciably if the proposal is not implemented, however, uncontrolled development and vehicular use in the valley floor could seriously detract from the view of the cliff formations. Uncontrolled use in the canyon could be destructive to the riparian vegetation and wildlife and the marring of the cliff surfaces which usually accompanies this type use would appreciably detract from the beauty of the area.

Noise and Odor:

The noise level in the Red Rocks area is very low. There is a certain amount of noise created by vehicular traffic along the road corridors within the area. Airplanes leaving and arriving in Las Vegas frequently pass over the Red Rocks. Noise from each of these sources will continue to increase as the air and ground traffic continues to increase.

There are no offensive odors in the immediate area. As traffic volume builds up it is conceivable that emissions from the automobiles could create a mild odor problem.

SCENERY QUALITY EVALUATION



000 - RATING AREA

LEGEND

A - QUALITY OF AREA -
SCALE A, B, C

MAP
NO.
11

Political - Type of Government

The Red Rock area is located entirely within Clark County. There is no political subdivision of government below the County level that exercises land use controls over the lands. The Clark County government, headquartered in Las Vegas, is under the direction of the Board of County Commissioners. Clark County encompasses an area of 7,927 square miles and had a 1970 population of some 273,000. The five-man Board of County Commissioners exercises legislative power through adoption of ordinances, resolutions, and orders, and also hears and decides appeals. Administrative power is exercised through the County Administrator. The County Administrator acts as Chief Administrative Officer of the County in coordinating, directing and supervising the work of the County departments and agencies. The Administrator also acts as advisor to the Board on problems affecting County departments and coordinating the legislative efforts of the County.

Functions of the County government include the Judicial, Institutional Youth Service, Parks and Recreation, Public Safety and Public Works. (Budget, Statistical and Staffing Report 1971-1972, Clark County, State of Nevada.) All lands surrounding the Red Rock area are under the jurisdiction of the Clark County government.

In addition to County government, there are other Federal and State agencies which exercise some forms of control over the area. Federal agencies include the Bureau of Land Management which presently has jurisdiction of the lands in the area. State agencies include the Department of Fish and Game which manages the game animals in the area. There are other Federal and State agencies indirectly involved, and the entire area is subject to Federal and State laws and regulations.

Planning

The Planning Department of Clark County has planning responsibility for the lands adjacent to the Red Rock area. The Department prepares general maps and plans, assists in drafting zoning ordinances to guide the orderly growth and development of the County, regulated land use and subdivision design, and participates in the activities of the Regional Planning Council which develops the area-wide master plan.

The Regional Planning Council provides an overall approach to planning for orderly growth and development of the area. It is responsible for developing the area-wide master plan and is involved in all requests for Federal funding for urban planning and development. This agency is also designated as the clearinghouse for all actions which would take place in the transfer area. The County, cities, school district and water district are participating members of the Council. (Budget, Statistical and Staffing Report 1971-1972, Clark County, State of Nevada). The present County master plan encompasses a portion of Las Vegas Valley only, and does not cover the area in which the Red Rock lands are located.

Zoning

Title 29 of the County Statutes provides for zoning of lands in Clark County. The general purpose of the zoning ordinance of Clark County is for "...promoting the health, safety, morals, and general welfare of the present and future inhabitants of Clark County and divides the county into districts and sets forth the regulations pertaining to such districts in accordance with the General Plan for Clark County...." (Section 29.01.020, County Statutes.) The Red Rock area falls into the R-U Rural Open Land District. "The Rural Open Land District is established for the vast areas of open land and to provide for a very low density

residential use." (Section 29.06.010, County Statutes.) This type of zoning is the least restrictive and can be termed a "holding" zoning until such time as a higher use is identified.

Other Land Use Controls:

A number of ordinances, codes and regulations are available for implementation, which would affect management and development.

A few of these would include zoning and subdivision ordinances, sewage and solid waste disposal, air and water quality regulations, and building, electrical and plumbing codes. In the present undeveloped state, these controls have no impact.

Without the proposed action, assuming minimal or no development of the area, these controls do not have a significant effect. However, the controls do exist and any contemplated change in land use would be subject to such controls.

Social and Economic

Clark County is the largest populated area in Nevada and one of the fastest growing regions in the nation. Evidence of a phenomenal growth in population is seen in recent census data: (1) from 1940 to 1964, County population as a percentage of State population had increased from 15% to 60%; (2) a 165% population increase occurred during the decade following 1950; (3) during only the first four years of 1960, a 100% population increase was recorded. By 1970, over 270,000 people lived in Clark County. This represents a 500% population increase from 1940.

There is little reason to believe that population will level off or decline in the next few decades. Immigration has accounted for 75% of recent increases, and as long as this type of growth is supported by an expanding employment base, Clark County should continue to grow.

Of special importance to future recreation development is the tremendous increase and the clearly predominate use by the tourists. The tourist has been responsible for the majority of the growth in the Las Vegas area. All evidence indicates that tourism will continue to support expansion in accommodations, food, gasoline, and related services. A very necessary part of tourist accommodations are the outdoor recreation sites. A recent survey indicates that over 12% of all out-of-State automobile tourists indicated that scenic attractions and outdoor recreation were a primary purpose of their trip. The attractiveness of outdoor recreation areas to the out-of-State visitor is evident in the Red Rock Canyon where 17% of the 1969 visitation was from out of the State. This probably is a result of the increase in the tourist influx in Clark County from 14 million in 1967 to over 22 million in 1970. The historical growth of Clark County's population is displayed in the table which follows. Of significance is the fact that the City of Las Vegas absorbed most of this growth until 1960; however, during the 60's a relatively larger share of the population increase took place in surrounding areas of the County. Clark County has also been increasing its population at a relatively greater rate than other areas of Nevada, as indicated by the following table. Most of the increase is due to immigration, rather than natural increase. The growing population is supported by an increasing tourist trade, linked principally to a growing population in southern California.

Tourism, entertainment and recreation are the key reasons for this non-typical distribution of employment. During 1969 over 5,600,000 persons visited the Lake Mead Recreation Area, and over 22,000,000 visited the Las Vegas resort area. Most of the County's manufacturing activity is located in Henderson, 15 miles south of Las Vegas.

Population of Clark County, Nevada - 1910-2000:

Year	Population
1910	3,321
1920	4,859
1930	8,532
1940	16,414
1950	48,289
1960	127,016
1970	273,288
2000	1,000,000 (High estimate - Environmental Assessment Pollution Abatement Project Las Vegas Wash and Bay, August 1, 1972)

Source: U. S. Census of Population

Clark County Population as a Percent of Nevada's Population, 1940-1970

Year	Percent
1940	15
1950	30
1960	45
1970	56

Source: U. S. Census of Population

Population projections and increased pressures--the relatively high population density of Los Angeles and its environs, and related urban and environmental problems have placed considerable pressure, in recent years, on the California desert areas as a source of outdoor recreation experiences. These same problems have caused many older people to seek retirement living space outside of the Los Angeles area. The area treated in this statement is on the fringe of the desert recreation

activity and may now only be in the process of "discovery."

The following baseline population table on page 74 summarizes the historic and projected population of the primary user areas associated with the area. Roughly, the user populations are expected to nearly double by the year 2000 from their 1970 levels. This represents a considerable decrease in the growth rate registered since 1950. The visitor day estimates of the above-mentioned table simply reflect the expected population growth. No attempt has been made to adjust for relative use over time since such adjustments depend heavily on accurate data regarding alternative development. "Supply creates its own demand" seems to be a truism with regard to allocation of recreation visits among sites. There is little question that demand for recreational experiences will increase at least as fast as any specified population group, but precisely where this demand will have its impact will depend on development levels, use densities, special features, and changing personal tastes regarding alternatives.

Economic Structures of Associated Counties in 1970

Employment statistics for Clark County, Nevada, exhibit the structural patterns expected from the earlier brief review of their economic history. The employment table on page 76 summarizes employment by broad industrial sector for the two Counties and also provides State and national percentage distribution for comparison. Clark County's one hundred thousand plus employment accounts for more than half the employment for the State of Nevada; therefore, differences of a percentage point or more between County and State employment distributions can be assumed relevant. Unemployment in 1970 for Clark County and the State of Nevada were slightly above five percent. Opinions vary as to normal limits for unemployment rates, but the range is not extreme.

Whereas 25% of the nation's employment is in the manufacturing sector on the average, less than five percent of Clark County's employees derive their income from this sector. Nearly 40% of Clark County's employment is derived from the services sector of the economy as compared to the national average of 15 percent. The substitution of services for the more traditional exportive manufacturing base as an engine for economic growth is attested to by the population growth previously mentioned and by the fact that employment in the construction sector is relatively much higher.

Employment of Associated Counties by Sector and Comparative State and U. S. Sectoral Distribution, 1970

Industry Sector	Clark County		Comparative % Distribution	
	Number	%	Nevada	U.S. ^{1/}
Agriculture	904	0.8	2.4	4.6
Mining	449	0.4	1.9	0.8
Construction	9,153	8.5	8.2	4.2
Manufacturing	4,955	4.6	5.2	25.1
Trans., Comm., and Utilities	8,118	7.5	7.8	5.7
Wholesale Trade	2,173	2.0	2.6	19.0
Retail Trade	17,711	16.4	16.5	19.0
Services	42,782	39.7	33.6	14.7
Government and all other	21,505	20.1	21.8	25.9
TOTAL	107,750	100.0	100.0	100.0

Source: 1970 Census of Population

^{1/} Compiled from Statistical Abstract, 1970.

The table below provides some representative measures of personal income and income distribution for Clark County compared to Nevada on a Statewide basis.

Annual Personal Income in Clark County and Comparative State Totals - 1970

Item	Clark County	Nevada
Personal Income (Dollars)		
Total (000)	969,079	1,744,795
Per capita	3,546	3,570
Percent of Families With Less than \$5,000	14.4	14.8
Percent of Families with Over \$12,000	42.6	41.3
Median Family Income (Dollars)	10,870	10,692
Poverty Level Income:		
Number of Families Below	4,827	8,641
Income of Poverty Families	1,755	1,778

Source: 1970 Census of Population

Baseline Population and Visitor Use Estimates to Year 2000

Population <u>1/</u>	1950	1960	1970	1980	1990	2000
So. California <u>2/</u>	4,762,846	7,445,425	9,512,963	12,081,463	15,428,028	18,621,630
Clark County, Nevada	48,289	127,016	273,288	388,057	423,586	504,914
Arizona Area <u>3/</u>	365,254	700,168	980,105	1,277,330	1,771,116	1,868,201
Visitor Days in Area A <u>4/</u>	Not Est.	Not Est.	178,733	225,529	285,999	--

1/ Projections beyond 1970 are based on BEA projections prepared for the Water Resources Council.

2/ Includes Los Angeles, Orange, San Bernardino, and Ventura Counties.

3/ Includes Mohave, Maricopa, Yavapai Counties.

4/ Assumes 1967-68 use adjusted only for population growth.

THE ENVIRONMENTAL IMPACT OF THE PROPOSED ACTION

Natural Environment

This section will consider the impact on the natural elements of the environment should the proposed action be taken.

Climate

The proposal would not affect the climate of the area. The forces that determine the climate of this area are generated in the Gulf of Mexico, Pacific Ocean, and the North American Continent, and are modified by the topography of the Southwestern United States. Any physical change superimposed in the Red Rock area by the proposal would be overridden by these forces.

Topography

The proposal would affect the topography of the area on a limited scale. The environmental impact on the topography of the Red Rock area would result from road and trail construction, construction of the Visitor Center, and campgrounds. Road construction would impact natural drainage patterns and land forms. Construction of the Visitor Center, campgrounds, etc., and associated cuts and fills would cause the same impacts on topography as road construction.

Water

The proposed action would have an impact on water, both from a water use and water quality standpoint. These impacts will be discussed in this section.

Impact on surface water - Since most of the surface water from spring sources is owned by private individuals, title to the waters would have to be obtained from these people. This would necessitate expending

considerable manpower and funds by the BLM as well as the inconvenience to the present owners of the waters.

Impact on overland flow - A direct increase in runoff from developed areas (roads, campgrounds, buildings, etc.) would result from these proposed actions. The magnitude of the increased runoff would be very small. The total area of development involved would be small compared to the total area of the recreation lands. Flood flows would be absorbed into the alluvium and: (1) evaporated, (2) transpired, (3) percolated into the groundwater, or (4) discharged from the area, as determined by the magnitude of the flow.

Impact on groundwater - Groundwater from wells would be used to the maximum extent to furnish water for consumptive use within the Red Rock recreation area. The use of groundwater could decrease the amount of water in the Las Vegas Groundwater Aquifer.

Impact of imported water - The possibility exists that water to meet all or part of the needs for the Red Rock Canyon Recreation area could be purchased from the City of Las Vegas or the Colorado River Commission. This alternative would require the construction of many miles of pipeline, or hauling water by tanker which would necessitate the construction of additional roads and storage facilities at each point of use.

Impacts of consumptive water use - The Red Rock area is located on the western edge of the Las Vegas groundwater basin. Any surface water, imported water, or groundwater consumptive use may have an adverse impact on this hydrologic basin. It has been documented in and around Las Vegas that overpumping has caused subsidence of the land surface resulting in damage. It is estimated that Las Vegas groundwater basin

has an average annual recharge of 25,000 - 35,000 acre-feet. The total additional consumptive use from surface and groundwater sources within the Red Rock Canyon Recreation area is estimated to be 46 acre-feet per year. This is less than 0.2% of the estimated annual recharge of the Las Vegas Basin. Because of the annual variability encountered in the amount of the recharge in the Las Vegas Basin, the consumptive use of 46 acre-feet may not be measurable or a significant percentage of the total recharge.

Soils

Construction of roads, campgrounds, trails, etc., as described in the proposal could have a major immediate impact on soils in the Red Rock area.

Visitor use, after construction, and over extended periods of time would have a deleterious effect on the soil at selected sites.

Construction activities in the Red Rock area may directly affect approximately 750 acres, and the soils on the construction sites would be altered.

Visitor use of land areas around all developments could cause disturbance of the soils. The degree of disturbance will usually decline with increasing distance from the developed areas. The activities (whether authorized or not) causing soil disturbance will include: hiking, wandering or playing, horseback riding, and use of trail bikes, off-road vehicles, and all-terrain vehicles.

Livestock and wildlife use would also have an impact on the soils.

Vegetation

Construction of proposed roads, campgrounds, trails, etc., as described in the proposal, could have a major immediate impact on vegetation in the Red Rock area.

Visitor use, after construction, and over extended periods of time would have a deleterious effect on vegetation on selected sites.

Construction activities in the Red Rock area may directly affect approximately 750 acres. The vegetation on the construction sites would be destroyed.

Visitor use of land areas around all developments could cause disturbance of the plant communities. The degree of disturbance will usually decline with increasing distance from the developed areas. The activities (whether authorized or not) causing disturbance of vegetation will include: picking of flowering plants, hiking, general recreation activity, horseback riding, use of trail bikes, off-road vehicles, and all-terrain vehicles.

Livestock and wildlife use would also have an impact on the vegetation.

Severe damage or destruction to unique plant communities in two natural areas, Lone Pine and Pine Creek, is possible by construction or visitor use.

Geology

The proposal would not affect the geology of the Red Rock area. Any activities associated with the proposal would not be of the type or scope necessary to cause tectonic activity. The forces controlling the geology are of a regional nature and would be unaffected by small-scale local activities.

Air Quality

Construction phases of the proposed developments in the Red Rock area would cause increased sources of dust, due to soil disturbance and excavation. Exhaust emissions from construction machinery would cause degradation of air quality.

In 1970, there were 90 vehicles per day using Red Rock Scenic Drive, 370 per day on the Red Rock Front Road, and 330 per day at Mountain Springs Summit. (This amounts to 5060 miles of vehicle use on these roads in the Red Rocks on an average day.) Using this figure, we have developed estimates of vehicle emissions per average day which are shown below. The emission rates were obtained from Public Health Service Publication No. 999-AP-4Z of the Environmental Health Service.

Types of Emissions	Rate Lbs./1000 Vehicle Miles	Estimated Daily Miles Traveled	Lbs. Emissions/day
Aldehydes (HCHO)	0.3	5060	1.518
Carbon Monoxide (CO)	165.0	5060	834.900
Hydrocarbons (C)	12.5	5060	63.250
Oxides of Nitrogen (NO ₂)	8.5	5060	43.010
Oxides of Sulphur (SO ₂)	0.6	5060	3.036
Organic Acids (acetic)	0.3	5060	1.518
Particulates	0.8	5060	4.048

Increased use of the type anticipated would increase the amount of particulates, sulphur oxides, nitrogen oxides, carbon monoxide, hydrocarbons, etc., in the air shed. The amount of the above mentioned pollutants which would go into the air should the proposal be implemented is not known. The pollutants could impact people living in the Red Rocks vicinity as well as tourists visiting the area. These additional pollutants could decrease the present quality of air in the Las Vegas Valley. Air quality could also be affected by camp fires and charcoal grills at the developed camping and picnic sites. The extent of this impact is unknown at this time.

Sewage Treatment

Treatment of sewage effluents would be difficult and costly since the lands are a considerable distance from present sewage treatment plants in the Las Vegas Valley. Sewage effluent would have to be hauled or piped to one of the plants or a separate sewage treatment plant constructed in the area. The possibility exists for septic tanks, but it is possible that septic tanks would contribute to the pollution of the groundwater supplies presently being used in the Las Vegas Valley.

An acceptable treatment system would have to be developed before the county could issue any building permits.

Wildlife

Primary impact of development of the recreation opportunities as proposed in the master plan and accompanying human use would be on (a) rare or endangered species, and (b) big game species. Small mammals, reptiles, amphibians and birds require relatively small individual habitat areas, or niches, thus developments would have impacts only on those in near proximity. Species having a high threshold of tolerance to the presence of man, such as birds, insects and rodents, would not be displaced as rapidly as the larger mammals.

The principal "threat" to wildlife would be the increase in the presence of humans--particularly near the water areas. Any campground or picnic area improvement would result in displacement of wildlife now inhabiting the areas. Increased human populations would have an impact on the wildlife community, both by physically displacing animals and by indirectly influencing wildlife by their close proximity and stretching wildlife's tolerance to man's presence.

Wildlife, by species, that would be affected are as follows:

Rare or Endangered Species

1. Prairie Falcon - As mentioned in the land uses section, falcons have been observed in the Red Rocks, but nesting areas have not been identified to date. The primary impact would be on nesting areas that are critical habitat areas in that human activity will drive parents from the nests.
2. Desert Tortoise - Habitat disturbance would be very minor. The primary impact would be that of people and vehicles. Most of the development and human activity would be out of their habitat area. The greatest threat to the desert tortoise is the possibility, and more likely the probability, of persons removing the tortoise when found. The tortoise is very slow moving and easily captured. This also makes the animal more susceptible to being run over by vehicles.
3. Gila Monster - Because of the rarity of this animal, and lack of information on habitat areas, we cannot objectively evaluate the impact that development would have on this species.

Big Game Species

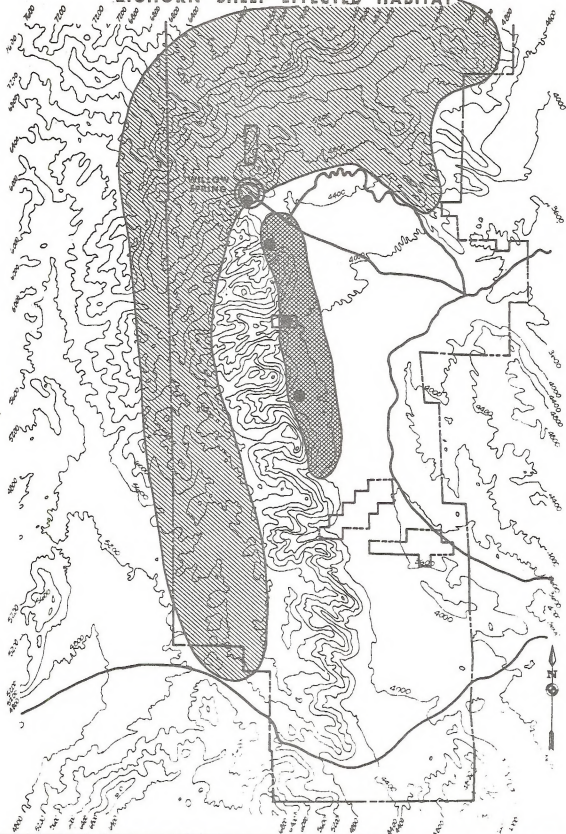
1. Mule Deer - Impact of the proposed development would be slight. Deer adapt well to increased human use of an area.
2. Desert Bighorn - The primary defense mechanism of the bighorn consists of observing potential enemies from open, and usually elevated vantage points. Bighorn have become accustomed to seeing people from a distance. It is the nature of the bighorn to feel relatively

secure when observing potential intruders from heights and the safety of him domain. This can be observed on the Mountain Springs Summit Highway where bighorn observe motorists from adjacent steep slopes. When motorists stop to traverse these slopes, the bighorn leave the area.

Many of the proposed facilities and use areas are planned within bighorn habitat areas. The net effect of the proposed development would be the loss of an estimated four waters and 2,100 acres of winter habitat (see Effected Habitat Map, Number 12, page 87 .) The alluvial fans occurring along the base of the escarpment serve as bighorn wintering areas during periods of snowfall and very cold weather. The road (Red Rock Scenic Drive) and trail planned below the escarpment, and the road development on top of the escarpment (Crestline Scenic Drive) would probably alter sheep use at these locations. It is estimated that a total of 13,000 acres of bighorn habitat, out of a total of 64,000 acres in the herd unit could be affected by the developments planned.

Any development near existing waters poses a threat to the existing riparian habitat so important as protective cover to wildlife. Even if care is taken to protect the habitat in the development period, the increased human use near waters would adversely affect the usefulness of the habitat. Hunters would have an opportunity, with new and improved access, to reach areas that have not been readily accessible before. The ratio of hunters over huntable animals would change with an

BIGHORN SHEEP EFFECTED HABITAT



LEGEND

▨ HABITAT EFFECTED by THE PROPOSAL

▨ BIGHORN WINTER RANGE LOST

● SPRINGS EFFECTED by DEVELOPMENTS

MAP
NO.
12

increase in hunters. Consequently, the hunter's chance for success in bagging big game would be more dependent on his abilities and skills than before.

Free-Roaming Burros

Since so little is known about the habitat requirements and use patterns of burros, the impact of the proposed action cannot be fully assessed. Human activity in the area of existing water may reduce the range of the burros and confine them to areas of less favorable habitat. Burros are, however, tolerant toward humans as exemplified by the Death Valley National Monument where the burro population has increased and has become a problem to both tourist facilities and their habitat.

Livestock

The proposed master plan development would attract increased numbers of people to the area. The greatest recreation activity would continue to be concentrated in the eastern portion of the Red Rocks. Associated recreation conflicts have been identified with increased use of springs and consequent effect on livestock. With increased recreational use, it is apparent that livestock disturbance problems could increase. Recreation or campground developments in the vicinity of springs at Pine Creek, Oak Creek, Icebox Canyon and Rocky Gap would preclude access to water by livestock in these areas.

The recreation management plan eliminates the possibility of artificial revegetation projects for purposes of increasing livestock forage production. It also places restraints on other types of projects (fences, water developments, etc.) which are not consistent with the primary objectives of recreation.

Watershed

The environmental impact on the watershed east of the Red Rock Escarpment would result from road construction, construction of the Visitor Center, campgrounds, and the added activity by people on the area around these proposed developments.

Along the road rights-of-way, the vegetation would be removed and the areas disturbed would be made virtually impermeable. Road construction would also concentrate natural drainage patterns which, in some cases would cause increased peaks and volumes of flow. Consideration should be given to the arroyos for their flood potential and the impact on downstream areas such as Las Vegas.

Construction of the Visitor Center, campgrounds, etc., would cause identical impacts as road construction, although less of the land area in the watershed would be affected.

West of the escarpment the construction of roads and trails and the associated increase in people would have a small negative impact on the watershed due to the small area affected by development.

Minerals

No known locatable mineral deposits exist. Although both sand and gravel deposits and a common variety of building stone are found in the area, the recreation plan would preclude their disposal. There are, however, sufficient quantities of these materials available elsewhere in the Las Vegas Valley. Recreational collecting of petrified wood is identified as an acceptable activity.

Recreation

The impacts on recreation opportunities are described in other parts of this section (i.e. wildlife, vegetation, burros, primitive, antiquities, aesthetics, etc.) This section describes the impacts on the various recreation uses in the area. In general, recreation use would be more regulated and controlled. Some uses, such as off-road vehicle use and target practice would be prohibited. The amount of primitive area would be reduced because of the development of roads and other facilities. This would reduce the usable space for wilderness users. Impacts on the primary recreation uses are as follows:

1. Sightseeing - would generally be restricted to established roads and trails. This means that indiscriminate use of 4-wheel drive and motor bikes for sightseeing purposes would be discontinued.
2. Picnicking - would be restricted to prescribed picnic sites.
3. Camping - would be restricted to prescribed camping sites.
4. Hiking - Visitors would be encouraged to use designated trails.
5. Horseback Riding - same as hiking.
6. Rock Climbing - would be restricted to prescribed areas.
7. Hunting - areas adjacent to intensive use sites and zones would be closed to hunting.
8. Target Practice - the entire area would be closed to the use of firearms except during established hunting seasons. Target practice would not be allowed in the area except for bow practice in the prescribed area.
9. Collecting - no collecting of plant, rock or mineral specimens would be allowed in the area.

10. Off-Road Vehicle - use is not allowed in the area except on designated roads and trails.

Primitive

The degree of the impact on primitive values would vary with the existing inherent value. Area 001 shown on Map Number 9, page 58, has a low value for primitive use at the present time. The development of additional facilities could reduce this value but not significantly. However, Area 002 has a very high primitive value. The introduction of additional man-made facilities could have a very significant effect on the primitive values. Presently the trail over Red Rocks Summit is the only intrusion which substantially affects the primitive values in the area. If the Brownstone Road and the Crestline Scenic Drive were constructed, both would have a significant effect on the primitive values. Approximately 2500 acres of land having high primitive value would be lost if the plan is implemented. Also, more people would have direct access to the remaining primitive areas which would tend to degrade the quality of experience for the dedicated wilderness enthusiasts.

Timber

No commercial saw timber exists on the Red Rock Canyon Recreation Lands. The proposed development would have little disturbance on the woodland vegetation. The proposed action would restrict or eliminate the possibility of harvesting Christmas trees, fence posts, and firewood. The only activity allowed would be collecting pinyon nuts. The development near the Pine Creek Natural Area and LaMadre Canyon would introduce increased people use with related trampling, pollution, littering, and vegetation vandalism. There would be little or no impact on the potential Lone Pine

Natural Area as no developments are planned in close proximity. The existing road is closed to off-road vehicle traffic. The plan calls for using this road as a foot trail. This would reduce impact from vehicles and volume of public use. The foot trail traffic would still expose this site to public use and impacts from trampling, pollution, littering, and vegetation vandalism.

The remaining woodlands are on the upper escarpment and away from proposed people use sites. Therefore, the impacts would be confined to road construction and roadside pollution. Some pinyon-juniper trees would be removed where the road is constructed and borrow sites are located.

Urban-Suburban

Implementation of the plan would cause little change in the urban-suburban character of the area. The construction of the Visitor Center and the Blue Diamond Administrative Site would create a need for utilities and access roads. Both sites are near existing roads and new construction would be minimal. Utilities, electricity and telephone could be brought into the Visitor Center from existing lines serving the residential area in Calico Basin. Approximately 10,000 feet of new construction would be required. Extension of electrical and telephone service from the Visitor Center to the Blue Diamond Administrative Site would also be necessary. It is anticipated that water for both areas would be developed on site. The method of sewage disposal for both sites has not been determined. Several alternative methods are available.

There are approximately 104,000 pounds of solid waste being hauled annually from the Red Rock area to the Blue Diamond pit, some 13 miles away. This material is being picked up from trails, roads, overlooks, undeveloped campgrounds and picnic areas. If the Red Rocks development plan was fully implemented, it is estimated that the amount of solid waste on the area would double.

Secondary impacts of developing a large recreation attraction would be the need for service facilities for the increased number of visitors. It is anticipated that service stations, stores, bars, etc., would be placed near entrance points to Red Rocks. With the expected population increase in the Las Vegas vicinity it can be anticipated that residential areas would be placed near the boundary of the recreation area. This type of development would require that county services--roads, schools, police and fire protection, etc.--be extended and increased.

Cultural Environment

As in the present situation, this section will deal with several categories of influences which have a direct bearing on the use of the area. Each will consider the effect on the area if the proposed recreation plan was implemented.

Antiquities

Physical destruction of archeological sites by the construction of roads, trails and recreation facilities, etc. would likely be the prime impact on antiquities values. Pot robbing and vandalism at archeological sites may be increased. This would depend on the manpower available to patrol the area and the measures taken to control physical access to the sites. The introduction of twentieth century facilities could adversely affect the integrity of the archeological sites in terms of modifying the physical setting of the sites.

Aesthetics

Visual - The development of roads, trails, structures, and other recreation facilities could have an adverse affect on the visual values. The magnitude of the impact would depend on the degree of success achieved in designing the facilities to harmonize with the line, form, texture, and color of the area and on the "visibility" of the facility. Most of the development sites, except for the Visitor Center, would be concealed in valleys where they would be visible for only short periods of time. Close-up views of these sites would present a fairly substantial visual impact. By far, the greatest visual impact would come from the Crestline Scenic Drive. The degree of slope in LaMadre Canyon and other places along the crest of the escarpment would require grading which would expose large cuts and fills that would be visible for many miles. Other roads such as Segment B of the Red Rocks Scenic Drive would not create as great an impact because it passes through topography which is slightly undulating and thereby provides ample opportunity to conceal the road.

The Visitor Center and associated facilities would be visible from most areas in the valley and consequently could have a significant visual impact.

The heavy use which would take place around development sites could cause vegetation to be trampled out and could result in a network of trails and erosional features that would scar the landscape and create a negative visual impact. Also the likelihood of wildfires started by man would be greater. Such fires usually leave ugly scars which are visible for many years. An increase in trash and litter throughout the area could be expected.

Noise and Odor - The increase in traffic volume generated by the new road developments would create additional noise and odor problems. Likewise the increased visitor use distributed throughout the area would create more human activity noises and would tend to break the solitude in the back country.

The use of heavy equipment would cause increased noise levels during the construction period.

Political - Type of Government

County government and Federal and State agencies would continue to exercise control over the lands in the Red Rock Canyon area. The anticipated increase of people use could create a potential for the occurrence of more vandalism and indiscriminate use. There may be an increase in criminal offenses and uncontrolled group activities which could in turn have an impact on local and county law enforcement.

Planning

As stated in the previous section, the present county master plan does not cover the area in which the Red Rock lands are located. However, any actions planned involving development or construction would be reviewed by the Clark County Regional Planning Council who act as the clearinghouse for intergovernmental projects in Clark County.

Economic

Implementation of the plan could provide job sources for a portion of the local work force in the Las Vegas community which is experiencing a high unemployment rate at this time. Contractors for the proposed construction projects would purchase supplies, materials, etc. in the

Las Vegas area. Based on current project construction costs, it is estimated that about 17 million dollars would be contributed to the local economy.

The variety of recreation experiences offered at the Red Rock Canyon lands could bring more people into the area which would further bolster the economy of Las Vegas and vicinity.

Over 600,000 visits were made to the Red Rock area in 1970. About 70% of this use originated from Las Vegas and Clark County. Based on the current trends in population growth and increased emphasis on outdoor activity needs by people, there could be an estimated 1,636,400 visitors annually at the Red Rocks by 1980.

Potential for Man-Caused Accidents

If the plan is implemented, there could be greater numbers of people attracted to the area and they would be dispersed over a wider area than is now possible. This could increase the possibility for man-caused accidents. Following are the types of accidents which could have significant impacts.

1. With more people participating in back country activities, there is a greater probability of crippling accidents which would require special rescue efforts. The need to bring emergency equipment into the back country for rescue purposes may result in destruction of vegetation and leaving vehicular tracks which could create a visual scar and lead to accelerated erosion.
2. Man-caused wildfire could result in denuding vast areas of vegetation and creating serious erosion problems.

3. Increased visitor use in the wild areas could result in accidentally introducing exotic plant species in the area (seeds are often carried in via shoes, pant cuffs, pockets, lunch sacks, etc.) This may upset the ecology of the area.

Potential for Natural Catastrophes

Fire

The ability to contain fires started by lightning or other means would be enhanced if the plan is implemented. However, there is a greater probability that personal injury could result from wildfires started by natural causes because of the greater numbers of people who would be spread throughout the area.

Earthquake

The proposal would not increase the probability of earthquakes but it is probable that development sites which are located in the canyons such as Rocky Gap, Pine Creek, Ice Box Canyon, etc. could be struck with boulders from the high cliffs and talus slopes during an earthquake. This could inflict personal injury on the visitors and destroy the recreation facilities and personal property such as automobiles, trailers, tents, etc. There is no evidence of major earthquakes in southern Nevada in the last million years. However, small tremors are fairly frequent. None have been large enough to cause rock movement in the Red Rocks area.

Flash Flood

There are frequent flash floods within the narrow canyons in the Red Rocks. These floods generally occur during high intensity, short duration thunderstorms. The resulting flood has a very high rate of

flow that is sustained for a very short time. The danger is greatest to persons hiking in the steep walled, narrow canyons. There is a certain amount of danger at the recreation sites located on alluvial fans at the mouth of the canyons such as the Rocky Gap and the Pine Creek sites. The flooding that occurs at these sites is more likely to cause property damage to vehicles, trailers, recreation facilities, etc. than to inflict personal injury. The full potential for natural catastrophes are unknown.

MITIGATING MEASURES INCLUDED IN THE PROPOSED ACTION

Topography

To minimize the effects of development construction on the topography, the functional requirements of the facilities would be carefully evaluated. Developments would then be located and designed to fulfill the functional requirements and to minimize the adverse effects on the topography from possible drainage channel changes, and changes in land forms by cutting and filling.

Water

Under full anticipated development of the Red Rocks Master Plan, one million visitor days per year are anticipated. The estimated water use is 46 acre-feet per year.

Mitigating Measures

To evaluate the area in terms of its overall long-range potential to meet both current needs and an anticipated increase in future demand, a comprehensive study of all controlling factors must be undertaken, obtaining data in sufficient detail to determine yield figures that can be defended. The quantity of water may be obtained from:

- (1) surface water, (2) groundwater, and (3) imported water.

Surface Water and Springs -

Spring sources and water courses would be cleaned and disinfected, as required. The water sources would then be protected from disturbance by outside influences (people, livestock, and wildlife). Patrolling of the area would be required to prevent vandalism and pollution of these surface waters. Surface water from springs would only be used when other sources are not readily available. This would assure that the ecosystems along water courses are maintained without further degradation.

Flood Problems -

Flood flows would not be controlled in the Red Rock area. Warning signs would be posted as required at suitable locations, and barriers would be constructed where required. Through construction practices, increased runoff from the developed areas would be released at non-damaging rates into the natural drainage patterns.

No development is anticipated along existing floodways, except for roads. Where roads cross major floodways, grade crossings that do not restrict the flow would be provided. These roads may be closed for short periods of time while flood peaks are passing.

Groundwater -

All wells and water systems would be constructed and maintained to prevent contamination of the groundwater aquifer. Septic tanks, leach fields, and package treatment plants would be located and constructed to preclude the possibility of contaminating the groundwater aquifers.

Sewage Treatment -

Where vault toilets are used, the vaults would be pumped by commercial firms on a scheduled basis. The effluent removed would probably be discharged into the Las Vegas sewage system. This would require additional treatment capability over and above the capacity required for the city's needs.

At sites where there is a demand and a sufficient volume of water, flush toilets and a sanitary sewer system would be provided to collect effluent and transport it to a suitable treatment facility.

The treatment facilities may be septic tanks and leach fields. Septic tanks are presently an acceptable method of sewage treatment in Clark County, Nevada, where site conditions are suitable. Where septic tanks are not suitable, package treatment plans would be utilized, providing, as a minimum, Secondary treatment. The effluent would be disposed of by evaporation and seepage ponds.

Consumptive Water -

All water for human consumption would be treated to meet the USPHS Drinking Water Standards.

Some sites in the recreation area may be dry sites. It would be necessary for visitors to provide the water necessary for their use in these areas; either from other points within Red Rocks, or from outside the area.

Soils

To minimize the effect of development construction on soils, the functional requirements of the facilities would be carefully evaluated. Developments would then be located and designed to fulfill the functional requirements. Engineering and site investigations would be made in light of the functional requirements and the impact of construction on the soils.

Techniques which may be used to minimize adverse impacts on the soils are:

1. Limit soil disturbance areas only to that area absolutely required to complete the development.
2. Provide close supervision of construction operations to keep equipment within construction limits.

3. Limit earthwork cuts and fills to the minimum necessary to meet the functional requirements of the facility involved.
4. Conserve topsoil from construction operations to use in revegetation of disturbed areas.
5. Provide adequate drainage facilities and other erosion control facilities.
6. Rehabilitate all disturbed soil areas that are susceptible to treatment.

To minimize the effects of visitor use on the soils in the Red Rock area, the following management techniques would be used:

1. Use regulations would be developed and enforced.
2. All vehicular traffic would be restricted to roads and trails.
3. Areas particularly susceptible to damage from unauthorized uses would be posted.

Vegetation

To minimize the effect of development construction on vegetation, the functional requirements of the facilities would be carefully evaluated. Developments would then be located and designed to fulfill the functional requirement. Engineering and site investigations would be made in light of the functional requirements and the impact of construction on the vegetation.

Techniques which may be used to minimize adverse impacts on the vegetation are:

1. Limit vegetation disturbance areas only to that area absolutely required to complete the development.
2. Provide close supervision of construction operations to keep equipment within construction limits.

3. Limit earthwork cuts and fills to the minimum necessary to meet the functional requirements of the facility involved.
4. Conserve topsoil from construction operations to use in revegetation of disturbed areas.
5. Rehabilitate all disturbed vegetative areas used during construction but not actually a part of the development.
6. Water development by means of drilling wells would be used to reduce damage to the ecosystem.

To minimize the effects of visitor use on vegetation, the following management techniques would be used:

1. Use regulations would be developed and enforced.
2. All vehicular traffic would be restricted to roads and trails.
3. Areas particularly susceptible to damage from unauthorized uses would be posted.

Air Quality

To minimize adverse impacts of construction on the air quality, the following constraints would be put on the contractor:

1. Limit the amount of clearing in advance of facility construction to reduce dust.
2. Require sprinkling of construction areas where dust is a problem.
3. Require that contractors and government equipment in the construction area meet current Exhaust Emission Control Standards.

Visitor use in the Red Rock area is largely associated with automobile transportation. Air quality degradation would be largely from auto exhausts. Measures used to minimize this source may be:

1. Limiting the number of autos into the Red Rock area at critical times.

2. Check each visitor's mode of transportation for current official certification that the unit meets or exceeds the Exhaust Emission Control Standards.
3. If open burning (campfires, charcoal grills, etc.) becomes a serious source of pollution, these practices would be curtailed or banned.

Wildlife

These mitigating measures would be developed to reduce impacts on wildlife:

General:

1. Wildlife management would emphasize maintaining existing populations. Where habitat is lost by development, new or improved habitat areas would be developed if possible to offset losses.
2. High priority would be given to preserving or improving the natural surface water for the plant and animal communities.
3. Environmental awareness would be developed through the implementation of a visitor and interpretive management plan. Public awareness would assist in the prevention of environmental degradation with its inherent loss of wildlife habitat.
4. All vehicular traffic would be restricted to designated roads and trails.
5. Removal or killing of any wildlife would be prohibited except hunting as allowed in accordance with the established State Fish and Game regulations.
6. Conflicts of use between hunting and wildlife observations would be considered in favor of managing wildlife for observation purposes.
7. Conflicts of use between wildlife and livestock would necessitate compatibility studies to determine dual use possibilities with emphasis on wildlife interests.

8. Wildlife management plans would be developed for the area.

Both game and non-game species would be given equal emphasis in the development of wildlife plans.

9. People management would be developed by information and education techniques with enforcement of regulations being an alternate and second priority in protection of the environment. The Visitor Center would act as a nucleus to control visitor use and understanding. Desert naturalists would roam throughout the area assisting the public with interpretation, enjoyment and proper use of the area to assure protection of the natural environment.

Whenever there is a critical habitat problem, public use would be restricted from these areas on a time or area basis to protect wildlife needs.

1. Proposed developments in areas of critical habitat for rare or endangered wildlife would be mitigated to the extent of technical feasibility.

2. Specific management studies and plans will be developed for each rare or endangered species.

3. Heavy emphasis on rare or endangered species visitor education would be developed. Special displays would be developed for the prairie falcon, desert tortoise and gila monster to inform people of these species' special management and habitat needs. Seeing and touching specimens would satisfy users' curiosity as opposed to self collection.

4. Protection of the desert tortoise and gila monster would be enforced as required by Nevada Fish and Game regulations.

Big Game:

1. Water developments would be constructed for bighorn sheep and deer

in the La Madre Mountains to offset habitat losses elsewhere.

2. A research program would be developed to study actual effects of public recreation on bighorn sheep. Protective techniques identified in the study would be initiated wherever possible.

Wild and Free-Roaming Burros

1. High priority would be given to preserving or improving the natural water for the plant and animal communities.

2. Special management studies would be developed to gain facts on habitat and environmental need for the wild burros. Habitat needs as identified in the studies would be protected wherever possible.

3. Environmental awareness would be developed through the implementation of a visitor and interpretive management plan. Public awareness would assist in the prevention of environmental degradation and its inherent loss of burro habitat.

4. People management would be developed by information and education techniques with enforcement of regulations being an alternate and second priority in protection of the environment. The Visitor Center would act as a nucleus to control visitor use and understanding. Desert naturalists would roam throughout the area assisting the public with interpretation, enjoyment and proper use to assure protection of the natural environment.

5. National laws protecting wild burros would be enforced on the area.

Livestock

1. If livestock are to use the eastern area compatibly with people use, new water supplies will have to be developed or water diverted from existing sources to areas where people do not concentrate.

2. A livestock management plan may be developed for the ephemeral type range found in the Red Rocks. This could help resolve some of the presently existing conflicts.

Watershed

1. Grading and clearing would be kept to a minimum and where possible all existing vegetation would be retained on the sites. Topsoil would be stockpiled, where possible, from the construction operations for use in the revegetation of disturbed areas.
2. Close supervision of the construction operations would be provided to insure that equipment is kept within the construction site limits. The surface area to be exposed by construction operations at any one time would be limited to reduce dust and erosion damage to the surrounding area vegetation and natural surface.
3. Roadways would be designed without large roadside ditches, shoulders or flat slopes to minimize the size of the disturbed area. Fords, culverts with special end sections, and rock rip-rap would be used to control erosion and runoff. No development is anticipated along existing floodways except for roads. Where roads cross major floodways, grade crossings would be constructed which do not restrict the flow of water.

Recreation

The mitigating measures for protection and preservation of the recreation resources are shown in other portions of this section. This section applies to mitigating measures related to the various recreation uses.

1. Conflicts between recreation users would be minimized by segregation of the various uses. For example, separate areas would be designated for group camping, family camping, group picnicking, administrative facilities, lodge, horseback concession, wilderness hiking, etc. (see Map No. 2, page 3).

2. Developments would not be allowed to exceed the design standards identified in the development plan for the various recreation sites.
3. Use at the various sites would not be allowed to exceed the design capacity set forth in the plan. This would be controlled somewhat by the design (only so many parking facilities available, etc.). If necessary, the use would be controlled by a reservation system.
4. The rules and regulations governing visitor conduct would be prominently displayed at the Visitor Center site and at all development sites. This information would also be communicated in the form of brochures and verbal instructions.
5. A ranger staff would circulate through the area on a regularly scheduled basis to insure that the visitors complied with established rules and regulations.
6. Detailed directions would be given at the Visitor Center on where to go, what to do, and visitor protection measures that should be followed.
7. Areas of the Red Rocks could be closed to visitor use where there are extreme hazards to the visitor or resources such as high probability of flash flooding, high fire hazard condition, etc.
8. Development sites, structures and buildings could be designed to minimize fire hazards. All buildings and major development areas would be equipped with emergency firefighting tools, and all personnel would be trained in fire safety and firefighting techniques. Fires would be allowed only in designated areas.

Primitive

There would be a loss of primitive values and the quality of the primitive experience would be reduced as a result of the proposals in the plan.

The plan calls for strong controls to keep mechanized equipment out of

the primitive area. It would also prohibit any uses or practices which would mar or destroy the wilderness environment in the "Wild Area" as shown on Map No. 9, page 58.

Timber

1. Transplanting native trees would be encouraged wherever possible.
2. No chaining or raiing of pinyon-juniper would be allowed.
3. No facility development except foot trails would be allowed in the Pine Creek Natural Area. The area adjacent to the Natural Area would be restricted to a day use site to reduce the intensity of use. The area would be patrolled periodically day and night, seven days a week, keyed to the use patterns that develop. Use would be controlled by issuing Special Land Use Permits or developing some other control system. A detailed program would be developed to protect, preserve and interpret this unique ecological community.
4. No developments would be planned for the Lone Pine potential Natural Area, other than using the existing road as a foot trail. This road is closed to ORV traffic. Permanent gates would be constructed to physically close the old road. The area would be included in the patrol route for the ranger force on a periodic basis. A detailed program would be developed to protect, preserve and interpret this unique ecological community.
5. Development proposed at La Madre Canyon would utilize existing openings as much as possible. The area would be patrolled periodically day and night, seven days a week, keyed to the use patterns that develop.

Antiquities

1. A detailed archeological survey would be completed prior to final design at all proposed development sites and along all road and utility corridors where development would take place.

2. If technically feasible, developments would be moved or modified to preserve archeological sites where they are located within the proposed development zone.
3. If construction or subsequent activities would significantly mar or destroy the scientific values, the site would be excavated and researched by a competent archeologist prior to development.
4. If an archeological site is discovered during the construction process, construction would be halted until a thorough investigation and excavation was completed by a competent archeologist.
5. Barriers such as a 4-foot chain-link fence would be placed around archeological sites where there is a high probability of pot robbing or vandalism. Interpretive signs would be placed at most sites (see note) requesting cooperation from the visitor for the protection and preservation of the values therein.

Note: Some sites are not identifiable by the average visitor.

The best protection that could be offered these sites is not to identify them with signs, etc.

6. Regular patrols would be made into areas having archeological sites to insure public compliance with the rules and regulations governing protection of antiquities.
7. Visitors would receive instructions at the Visitor Center concerning the rules and regulations pertaining to antiquities and these rules would also be placed on signs adjacent to areas having significant archeological values.

Aesthetics

Visual:

The following mitigating measures would be applied to minimize the visual impacts:

1. Grading and clearing would be kept to a minimum. This would be achieved principally by selecting sites or alignments where the development would require a minimum of grading and clearing. Where grading and clearing is required, cuts and fills would be kept to a minimum. Cleared and graded areas would be contoured and revegetated to harmonize with the line, form, texture, and color of the immediate area. Native vegetation would be retained where at all possible. Within the realm of technical feasibility, plants which have to be removed would be preserved and transplanted.

2. Site and Alignment Selection. An overriding criteria in the location of all developments would be the preservation of the natural environment or the natural scene. This includes consideration of the inherent effects that would accompany construction and operation of the sites, such as increased trampling and vandalism.

3. Structures. All structures would be designed to harmonize with the line, form, texture and color of the existing landscape.

4. Signs. Information and interpretive signs would be rustic in character and would be located and designed to blend with the natural landscape. Traffic control signs would be kept to an absolute minimum to insure visitor safety. The posts and backs would be painted to harmonize with the surrounding area.

5. Visitor Control. Every effort would be made to control the visitors so they would not destroy any environmental qualities. The rules and regulations governing the use of roads, trails, garbage facilities, etc. would be prominently displayed at the Visitor Center (the point at which most visitors would enter the area) and at all the developed sites. Roads would be designed to discourage off-road use.

Barriers and signs would be placed at locations along the roads where there is a high probability of illegal egress. Visitors would be encouraged via publications, signs, and oral instructions to stay on designated trails and to deposit litter and garbage in receptacles which would be furnished and regularly maintained at all developed sites and other logical locations. All development areas would be patrolled on a regular basis to insure visitor compliance with the rules and regulations.

6. Fire Control. Fires would be allowed only in designated areas. Use could be restricted in areas of high fire hazard. Emergency fire-fighting equipment would be maintained at both of the administrative sites.

7. Telephone and Power Lines. All telephone and power lines would be located underground.

8. Existing Scars. All existing roads, trails, etc. which are vacated would be restored to a natural condition by scarifying the area and revegetating with native species.

Noise and Odor:

All vehicles which use the area would be required to meet the noise and air pollution standards required by State law.

Planning, Zoning, Ordinances, Codes and Regulations

There exists local land use regulations to control any proposed level of development within the area. Zoning authority exists which can restrict types of land use. In addition to the zoning ordinance, building, electrical and plumbing codes would be imposed on any potential contractor. Regulations governing sewage treatment, solid waste disposal, air and water quality also exist.

The County has the authority to enforce zoning ordinances, building codes, solid waste disposal and sewage treatment practices, air quality standards, and other regulations, codes and ordinances. County authorities are vitally concerned with air and water pollution levels. In the past, only modest land use controls to promote orderly growth and quality development have been exercised by local officials in Clark County.

ANY ADVERSE EFFECTS WHICH CANNOT BE AVOIDED SHOULD THE PROPOSAL BE IMPLEMENTED

There are a number of adverse environmental impacts which could not be avoided or mitigated if the Red Rock Canyon Recreation Master Plan was implemented. Many impacts could be beneficial or adverse depending on one's point of view. The following are the probable effects:

Topography

There would be permanent land form changes caused by cutting and filling. There will also be drainage channel changes as a result of the proposed construction.

Soils

There would be considerable soil disturbance during construction. An increase in soil erosion is expected in some areas due to concentrations of runoff from construction of roads, trails, etc.

Air

An increase in air pollution would result. The exact quantitative amounts of pollutants that could be expected from the additional automobile use in the future and heavy equipment in the area during construction is not known.

Vegetation

Success in revegetation could be less than desirable using the present known techniques. The native vegetation would be mostly eliminated adjacent to building sites, roads, trails, etc.

Wildlife

General:

1. Wildlife would be displaced by the space taken up by development.
2. People would harass wildlife, particularly small game, rodents and amphibians. They would also possibly capture small animals and remove them from the area.

3. Wildlife would leave areas and available habitat where public facilities are developed and/or concentrated use patterns develop.
4. Water would be used for human consumption that would normally be available for wildlife. Availability of water would be restricted to a limited time due to interference from the public.
5. Wildlife would be run over or hit by auto traffic on roads.

Rare or Endangered:

1. The rare or endangered species natural living conditions would be altered by the increased presence of humans.
2. People would probably capture and remove live desert tortoises.
3. The gila monster would probably be killed by uninformed fear-filled people.

Big Game:

1. Recreation use would infringe on bighorn sheep habitat. This would restrict bighorn sheep to inaccessible locations.
2. Hunters would bag accessible rams and sheep observations by recreationists would be limited to lambs, ewes, and young rams.
3. Public contact would be increased year-round by wildlife photographers having easier access.

Wild and Free-Roaming Burros

Inadequate factual data is lacking to accurately predict what impacts would be unmitigated. Undoubtedly, public use and burro use would result in an unmitigated impact. However, studies at the National Monument at Death Valley indicate burros have a high tolerance for people infringement.

Livestock

The recreation management plan eliminates the possibility of artificial revegetation for purposes of increasing livestock forage production in

the area. It also places restraints on other types of projects (fences, water developments, etc.) which would not be consistent with the primary objective of recreation.

Recreation

To provide protection for the resources and to insure compatibility between recreation users, visitor use would have to be regulated and controlled for an indefinite period of time. Certain uses such as target practice and undesignated routes for off-road vehicle use would be discontinued indefinitely. Hunting would continue to be restricted around heavy use sites and as use pressures build up, it may be necessary to close the entire area to hunting for safety purposes.

Primitive

Approximately 2500 acres which presently have high primitive values would be lost due to road construction. The quality of the wilderness experience would be diminished because of the increased use in the back country, induced by better road access.

Timber

Some vandalism could take place particularly in remote locations even with periodic patrol and would most likely be in the form of initials carved in trees.

Antiquities

Regardless of the intensity of the archeological survey, the care taken to avoid destruction of archeological sites, the salvage excavation completed, or the thoroughness of enforcement of rules and regulations, it is inevitable that there would be losses in archeological values. These losses would come in two forms:

- (1) The loss of scientific information due to the manipulation of the stratigraphy, and

- (2) The loss of human interest value due to the presence of roads, trails, recreation facilities and other developments representative of the 20th Century era.

Aesthetics

Visual:

The physical presence of buildings and other structures associated with the recreation developments would have a permanent adverse affect on the scenic values. The scars which remain from road construction, site clearing would remain for many years. The trampling of vegetation and exposing of bare soil and subsequent soil erosion would have long lasting affects on the scenic values.

Noise and Odor:

The noise and odor created by vehicular use would have a continuing impact on the area for an indefinite period of time.

Litter and Trash:

There would be an increase in the amount of litter in the Red Rocks as a result of more people walking and driving in the area.

Potential for Natural Catastrophe

Natural catastrophies such as flash floods, fires and earthquakes could happen. Their affect on the natural resources would not be appreciably different with or without implementation of the plan. Most of the effects on man or man-made facilities in the area can be avoided, but not all. Some people would be injured, some facilities and personal property would be damaged.

Potential for Man Caused Accidents

Regardless of measures taken to prevent man caused accidents, fires, personal injuries, and to a lesser extent introduction of exotic plant or animal species would occur.

RELATIONSHIP BETWEEN LOCAL SHORT TERM USES OF MAN'S ENVIRONMENT AND
THE MAINTENANCE AND ENHANCEMENT OF LONG TERM PRODUCTIVITY

Concerns of short term use and long term maintenance or enhancement of resource capabilities are centered about the stock-flow characteristics of resources. That is, whether a resource is depleted as a result of its use or whether it is replenished periodically with renewed ability to provide services. A related aspect bearing upon these concerns is that of investment--the incurrence of costs, both monetary and non-monetary, in the present with expectation of increasing the flow of benefits in the future. Obviously, any "natural" ecosystem of a given micro unit of land is going to be altered and often destroyed as a result of alternative use and such effects are imminent unless specific steps are taken to reestablish pre-existing conditions. For the proposed action, a significant amount of the area would be so affected over the years as the recreation sites are developed. Recreation and leisure time use would undoubtedly increase in the future. Whether this is indicative of enhancement of man's environment is, of course, a matter of individual and collective value judgments. Extending considerations to the economic sphere, productivity would clearly be increased as a result of development.

To meet the needs as outlined in the Recreation Management Plan, development and management would proceed through a logical sequence of phases. The first phase identifies development and management which would accommodate the most urgent recreational needs within the alternative course of action determined. The second phase would follow in priority, etc. Each phase of development would have its initial short term effect on the environment. This would consist of scarring and the construction of facilities that may detract from the natural setting. The construction of roads, trails and campgrounds would open back-country areas not now readily

accessible to the general public. It would mean more wildlife disturbance, more vegetative and watershed damage, and the general intrusion of a nearly pristine area. Management would play an important role in the manipulation of visitor use. People would be more evenly distributed over the Red Rock area with campground and other use supervision.

The effects of the proposed action on air quality would occur between initiation of development and continue so long as technology and life style patterns continue in their present form. The long term effects on mankind of exceeding current air quality standards, but not reaching critical health levels, is not known.

From an economic and social point of view, the short term effects would be (1) to contribute about \$17 million to the local economy due to construction and (2) to provide a needed recreation facility within a few minutes drive of Las Vegas.

In the short run (to the year 2000), recreation would undergo progressive change from uncontrolled free use to high density public and commercial types of activity. During this period, the area would provide an intermediate type of recreation experience between the high density uses on the Colorado River to the south (which would be further ahead in the development process) and the more extensive uses encountered in the national recreation area above Davis Dam. Whether the long run high density recreation uses are considered to be a degradation or an enhancement of recreation in the area is a matter of value judgment.

ANY IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES WHICH WOULD BE INVOLVED IN THE PROPOSED ACTION SHOULD IT BE IMPLEMENTED

Land

Implementation of the plan with the construction of improvements would devote lands permanently to that use. The land upon which developments are placed is an irretrievable commitment for all practical purposes.

Water

The proposed action requires the development of several water sources for the planned improvements. This water would most likely come from ground-water supplies at an estimated rate of 46 acre feet per year and could place an additional strain on the already limited supply of water in the Las Vegas groundwater basin.

Air

Development of recreation facilities and new roads would invite more users to the area, hence an increase of automobile traffic. The increase in exhaust emissions may decrease, to a limited extent, the quality of the air in the Las Vegas air shed. The exact amount of pollutants that would be added is not known.

Primitive

Approximately 2500 acres which presently have high primitive values would be lost due to road construction. The quality of the wilderness experience would be diminished because of the increased use in the back country, induced by better road access.

Recreation

To provide protection for the resources and to insure compatibility between recreation users, visitor use would have to be regulated and controlled for an indefinite period of time. Certain uses such as target practice and off-road vehicle use would be discontinued indefinitely. Hunting would

continue to be restricted around heavy use sites and as use pressures build up, it may be necessary to close the whole area to hunting for safety purposes.

Wildlife

Implementation of the proposed action and the anticipated increase in human use would result in an accompanying displacement of most species of wildlife found there. Recreation use would infringe on the bighorn sheep habitat and cause these animals to move to more inaccessible locations in the Red Rocks. There would doubtlessly be an increase in the number of wildlife run over or hit by auto traffic on the roads.

Visual (Aesthetic Values)

The construction of man-made facilities such as roads, trails, buildings, water collecting devices, and other recreational needs would reduce the natural aesthetics of the area. The scars which remain from road construction and site clearing would remain for many years. The noise and odor created by vehicular use would have a continuing impact for an indefinite period of time.

Antiquities

Regardless of the intensity of the archeological survey, the care taken to avoid destruction of archeological sites, the salvage excavation completed or the thoroughness of enforcement of rules and regulations, it is inevitable that there would be losses in archeological values. These losses would be in two forms:

- (1) The loss of scientific information due to the manipulation of the stratigraphy, and

- (2) Regarding the human interest value due to the presence of roads, trails, recreation facilities and other developments representative of the 20th Century era.

Minerals

The area has been closed to mineral exploration as a result of the designation of the Red Rock Canyon Recreation Lands being placed on the lands in October 1967.

ALTERNATIVES TO THE PROPOSED ACTION

There are six alternatives to the proposed action that will be discussed.

The alternatives in summarized form are:

- I. Full development below the escarpment, with limited development above the escarpment. *
- II. Limited development below and above the escarpment.
- III. Full development below the escarpment with only primitive development above the escarpment.
- IV. No further action. Use the area in its present condition.
- V. Restricting visitation use to day use only with no overnight camping.
- VI. Holding the area as is until another agency can take over management.

* Reference is continually made to the escarpment. The escarpment is the sandstone formation running north and south that divides the recreation lands into two elevations and use areas.

The format used to discuss the unmitigated environmental impacts, mitigating measures and unavoidable effects on the environment for each alternative will be the same as used for the proposed action. However, the discussion will be limited to those impacts that differ from the proposed action or where the impacts will be beneficially or adversely affected to some degree.

Table 1, page 124, shows the level of management and major development for all possible actions.

Table 1

	MAJOR RECREATION DEVELOPMENT JOBS																															
	Higher Elevation Areas		Lower Elevation Areas																													
	Ramshead Road	Ramshead Guard Station	Crestline Scenic Drive	Skyline Trail	Foxtail Trail	Mountain Springs Adm.	Ramshead	Willow Springs	OHV Trails	Lamadre Canyon & Red Rock Canyon	Dump	Brownstone Loop Road	Red Rock Scenic Drive	Calico Hills Trail	Front Trail	Lodge Area	Lamadre Canyon	Dude Ranch	Blue Diamond Adm. Site	Interpretive Center	Oak Creek	Pine Creek	Ice Box	Lost Creek	Rocky Gap	White Rock	Sandstone Quarry	Ash Creek	Calico Springs	Red Springs		
Proposed Action			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Alternative I	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Alternative II	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Alternative III			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Alternative IV								X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Alternative V	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Alternative VI	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Explanations:

X denotes features included in the proposed action and each alternative.

Levels of Management:

Management is considered to be at the desired level to provide visitor and resource use that would result in low risk for environmental degradation, provide maximum protection to improvements, developments, environmental values and visitors.

ALTERNATIVE I

FULL DEVELOPMENT BELOW THE ESCARPMENT WITH LIMITED DEVELOPMENT ABOVE THE ESCARPMENT

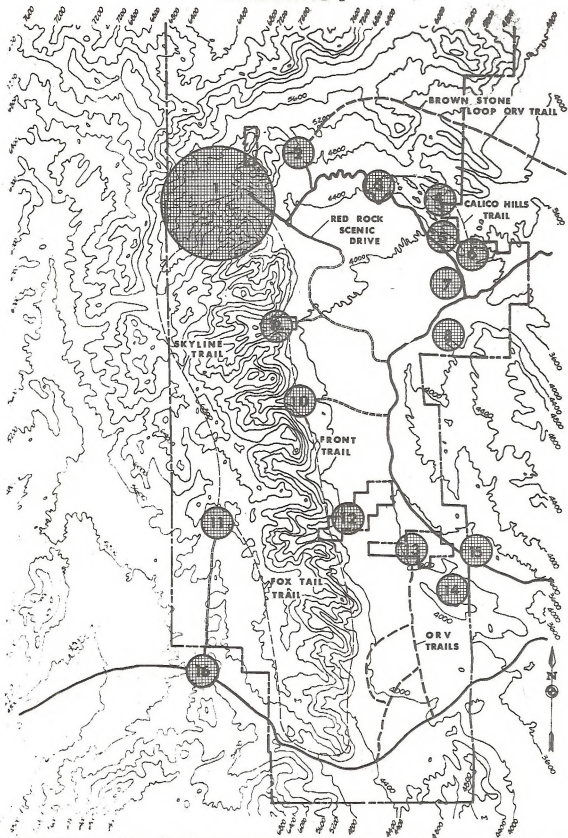
Full development would be planned on the lower escarpment; i.e., the types of developments shown in the existing plan with limited development on the upper escarpment. Limited development means road development into the Rams Head Area from the south from Highway 16, with the related support facilities as planned for that area; i.e., overlooks, viewpoints, campgrounds, picnic site, and trail head. With this alternative, there would be no administrative facility at Mountain Springs. However, a Guard Station would be developed on the entrance road to Rams Head to control use, collect fees and guide and inform the public. (See Alternative I Map, page 126).

The road would end at the Rams Head area with the Skyline Trail leading north and connecting with the La Madre Red Rock Canyon facility and Foxtail Trail leading south connecting with Highway 16 and the Front Trail. (The Last Creek, Ice Box, Rocky Gap and La Madre areas will hereafter be collectively referred to as La Madre and Red Rock Canyons).

THE UNMITIGATED ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION UNDER ALTERNATIVE I.

This section will discuss the impacts of action as if no mitigating measures are taken. Only those impacts that differ from the proposed action will be discussed.

ALTERNATIVE I



PROPOSED DEVELOPMENT

- 1 RED ROCK & LA MADRE CANYONS
- 2 WHITE ROCK
- 3 SANDSTONE QUARRY
- 4 ASH CREEK
- 5 CALICO SPRINGS
- 6 RED SPRINGS

LEGEND

- 7 INTERPRETIVE CENTER
- 8 BLUE DIAMOND ADM.
- 9 PINE CREEK
- 10 OAK CREEK
- 11 RAMS HEAD
- 12 LODGE ZONE

- 13 DUDE RANCH

- 14 DUMP

- 15 CONTACT STATION

- PROPOSED TRAIL

- EXISTING ROAD

- PROPOSED ROAD

- 16 RAMS HEAD GUARD STATION

MAP
NO.
13

The intent of this alternative is to eliminate road construction from the White Rock area above La Madre Canyon to Rams Head, west of the escarpment. This section of road would cause significant environmental damage. The recreational opportunities could still be utilized although a shift in the use pattern and a decrease in visitor management control would result.

Physical Factors

The overall impacts on the physical features would be similar to those discussed for the proposed action. The differences would be in the degree of impacts previously discussed.

The physical factors of climate, topography and geology have the same impacts as discussed under the proposed action.

Water quality - the sites requiring potable water would still be developed.

Benefits would be generated by reduced construction resulting in less soil movement and siltation of water sources. A direct benefit would be the reduced possibility of siltation of the La Madre Spring and Reservoir.

Soil - Benefits would result from reduced soil disturbance with less road construction.

Adverse impacts would be generated by confining public use to less area of the Recreation Lands. This could result in a slight increase in soil compaction in development areas.

Vegetation - Benefits would result from reduced road construction and its related construction clearing and grubbing.

Adverse impacts could develop from concentrating use in a smaller area of the Recreation Lands. This could cause a slight increase of vegetative trampling in the facility development areas.

Air Quality - Benefits would be slight because of the reduced construction dust. There may be reduced vehicle use and therefore, a reduction in gas and diesel fumes in the upper half of the Recreation Lands area.

Adverse impacts could come from increased traffic on the Red Rock Scenic Drive and the Rams Head Road. This could affect the benefits generated by the reduced traffic on the upper area.

Land Uses

Wildlife benefits could be generated from leaving a natural avenue or route of travel for bighorn sheep and deer between the escarpment and the La Madre Mountains. This would result in a significant benefit in the amount of natural water for wildlife as unrestricted access would be available into Pine Creek, Ice Box, Lost Creek and La Madre Springs.

Free Roaming Burros - lacking definite information to the contrary, it is assumed public use of the area would have little impact on the burros. There could be benefits to the burros' natural range from reduced public use.

Livestock - Benefits would result from livestock being able to continue using the area as in the past.

Adverse impacts could develop between people and livestock. Some

people do not understand livestock use and could be quick to criticize when and where livestock are congregating around their camping and picnic sites. Public pressure could eventually eliminate grazing from much of the area.

Watershed - benefits could come from the closure of the area to undesignated ORV trail use. Without indiscriminate use, the undesignated ORV trails will heal, and the watershed should improve in the future.

Adversely, the degradation around the developed site would cause watershed loss, but would be slight compared to the total picture. The ORV restriction would improve the watershed; however, this could be hard to enforce due to the size of the area and the number of users in the Las Vegas Valley. Most of the indiscriminate use would probably be generated away from the developed areas along the west side of the Red Rock Area out of Lovell Canyon and Mountain Springs.

Minerals - there should be little change in the minerals use from the area. There undoubtedly could be increased demands to allow sand, gravel and building stone removal from select sites of the area.

Recreation - elimination of this section of the Crestline Scenic Drive could significantly change the pattern of visitor use. This change could cause both beneficial and adverse affects to the recreation opportunities. Benefits would develop from eliminating the road as discussed in the wildlife section, and big game would have more chance to roam free. This could have an effect of increasing the chance of viewing and taking photographs of big game on the escarpment. Wildlife would also have more access to water, which would increase the opportunities for public view.

There may be increased enjoyment at Rams Head Overlook by designing the road so the visitor has a sudden surprise view to the scenic attraction from this point.

The quality of the hunting experience would be enhanced as the experienced hunter would have a better chance to get away from the road and people noise. The same quality advantages would be developed for hiking and horseback riding. The trail between the Red Rock La Madre Canyon area and Rams Head would not parallel a road and there would be an increase in the experiences received by people using this trail to get away from mechanical noise and investigate new territory. This trail would be approximately 10 miles in length, an easy one day walk on foot. Other spur trails could be available off this main trunk.

Adverse effects could come from pattern shifts in visitor use. The area's ability to satisfy the demand for driving for pleasure would be significantly altered. This alternative would reduce the scenic opportunity to a one loop system below the escarpment and one dead end system ending at Rams Head. The use of this dead end road at Rams Head would eliminate the possibility of a one way road system, which adds to the driving pleasure of a scenic drive. Use by scenic bus tours from Las Vegas would be reduced to a stop at the Visitor Center and lower escarpment tour instead of both lower and upper escarpment scenic opportunities. Instead of one entrance point for scenic tours, use would be generated from two major points. This division of visitor control could reduce visitor satisfaction and increase management

and protection costs. There could be a significant impact on the use of the Rocky Gap and La Madre Canyon sites for public facility development. The shift of access to La Madre Canyon would cause traffic to go through the Rocky Gap site, resulting in an unsafe condition where heavy traffic passes through the middle of a recreation development instead of ending at the site. This would also result in the elimination of one of the proposed developments at Rocky Gap or La Madre Canyon because of the route required through the campgrounds. A secondary impact of this action would be the reduction of the number of usable units for camping and picnicking, which could either cause increased environmental degradation from over-use at the other site, or the public being turned away when maximum unit use is reached at the site.

Visitor protection could require a high degree of control and training. Search and rescue operations would be more difficult due to the increased areas in a primitive state. Costly equipment would have to be contracted, such as helicopters. It would require more time to find lost or injured recreationists.

Fire protection would require the use of hand crews instead of a faster more efficient mechanized system. Primitive - benefits would be significant to the primitive values and to the user. The high value primitive zone, as mapped 002, page #9, in the existing situation would not be devaluated by road construction except for a minor area at Rams Head. At Rams Head, a

road and overlook would probably be established on the edge of the escarpment, inside the high primitive zone. Primitive users would have an area large enough to get away from the effects of man, such as noise from the developed areas.

The primitive character of the area would be difficult to maintain. Use would be extremely high and management techniques limited due to regulations governing primitive management. Basically, this close to a population center, the primitive area would be overused. To prevent this would require management to restrict the number of visitors to the area.

Timber - benefits would be slight since there would be only a few trees removed from the area with this alternative. There may be benefits by not building above the Pine Creek natural area, thereby eliminating massive use directly above a unique natural area.

Urban - Suburban: Benefits would be the same as described in the proposed action. An adverse impact would be the increase from traffic generated on the Blue Diamond and Pahrump Highways, due to the elimination of the Crestline loop road system.

Cultural Environment

Limited development of the upper area could cause different impacts to the cultural environment.

Antiquities - benefits would come from non-construction of the road near or across known mesal pits, thus preserving the actual site for interpretation in the Red Rock Canyon area. Additional protection

would come from the reduced access to the mesquite pits.

Aesthetics - benefits to the aesthetics would be significant. Without a road across La Madre Canyon and upper Red Rock Canyon, the most significant negative visual impact from all developments would be eliminated. Road construction in La Madre Canyon and other places along the crest of the escarpment would expose large cuts and fills to full view from the lower valley, the Visitor Center and Blue Diamond Highway. The construction of this segment of road would be directly opposed to the reason the Red Rock Canyon area was designated a Recreation Lands - its scenic grandeur.

With development to the Rams Head area the best focal point for viewing the escarpment and the valley floor could still be available to the general public. This would also leave an undeveloped area between Rams Head and La Madre Canyon for people to explore and find their own exciting view. The opportunity to view the sandstone geologic formation close at hand and receive an educational interpretative story would still be available to the public at the Rams Head area, the best area for this purpose along the upper escarpment.

Road construction into Rams Head from the south is not considered difficult due to the more advantageous slope, ridges and soils; therefore, road scars could be kept to a minimum.

Adverse impacts could be caused by reducing public access to view the escarpment and the valley floor from various points along

the crest of the escarpment. The chance to view the sandstone formation close at hand would be restricted to trail access and the Rams Head area. There could be increased potential for wild-fires in the back country. This would be due to decreased mobility and increased initial attack time. However, this may be offset by a reduction of man-caused fires.

Noise and Odor - benefits would be the reduced affect range of noise and odor into isolated parts of the undeveloped areas. Adverse impacts would be generated by confining and increasing vehicle use to a more limited area of the Red Rock area. However, this should not be a significant increase over the noise and odor already being generated by the proposed action.

Socio-economic benefits - changes are few under this alternative. People would be encouraged to use the area more on their own. This would help individuals as well as families experience a better understanding of the environment.

Adverse effects would come from less dollars being contributed economically to the Las Vegas area's recreation and construction industry. The use restrictions may cause the user frustrations which could be taken out on the area and downtown Las Vegas. Political - there would be no change to the political setting.

The following table shows the impact of this alternative on the environment, both positive and negative. A scale of high, moderate and slight was used.

TABLE I
ENVIRONMENTAL IMPACT OF ALTERNATIVE AFTER MITIGATING MEASURES

Physical Factors		Land Use		Cultural Environment	
CLIMATE	No impact	WILDLIFE	Moderate conflict	ANTIQUITIES	Moderate negative impact
TOPOGRAPHY	Slightly changed	BURROS	Moderate conflict	AESTHETICS	Slight negative impact
WATER QUALITY	Slightly lower	LIVESTOCK	200 AUM's lost	NOISE	Moderate negative impact
SOIL	Slight change	WATERSHED	Moderate negative impact	ODOR	Moderate negative impact
VEGETATION	Slight alteration	MINERALS	High negative impact	SOCIAL/ECONOMICS	Moderate positive impact
GEOLOGY	No change	RECREATION USE	Moderate Improvement	POLITICAL	No impact
AIR QUALITY	Moderately lower	PRIMITIVE USE	Moderate negative impact		
		TIMBER	High negative impact		
		URBAN/SUBURBAN	Moderate positive impact		

The following table is the overall difference between this alternative and the proposed action. Averaging all factors for a single opinion for each element of the environment differences will be shown as beneficial (better) or adverse (worse) than the proposed action on a severe, high, medium and slight scale.

TABLE II
DIFFERENCES BY TAKING ALTERNATIVE I

Physical Factors		Land Use		Cultural Environment	
CLIMATE	No Difference	WILDLIFE	Medium Benefit	ANTIQUITIES	Medium Benefit
TOPOGRAPHY	Medium Benefit	BURROS	Medium Benefit	AESTHETICS	High Benefit
WATER QUALITY	Medium Benefit	LIVESTOCK	No Difference	NOISE	Slight Benefit
SOIL	Medium Benefit	WATERSHED	High Benefit	ODOR	Slight Benefit
VEGETATION	Medium Benefit	MINERALS	No Difference	SOCIAL/ECONOMICS	Medium Adverse Impact
GEOLOGY	No Difference	RECREATION	Medium Benefit	POLITICAL	No Difference
AIR QUALITY	Slight Benefit	PRIMITIVE USE	High Benefit		
		TIMBER	Slight Benefit		
		URBAN/SUBURBAN	Moderate Adverse Impact		

ALTERNATIVE II

LIMITED DEVELOPMENT BELOW AND ABOVE THE ESCARPMENT

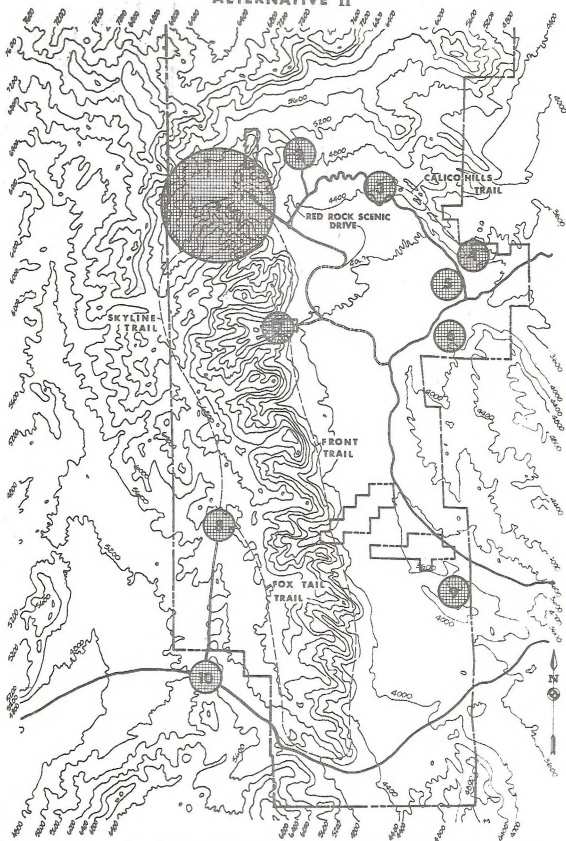
Limited development would be planned below the escarpment, i.e., development in the Pine Creek area, Red Rock/La Madre Canyon area, White Rock area, Sandstone Quarry and Red Springs. Development would also include the Visitor Center, the Blue Diamond Administrative Site, and construction of Segment "B" of the Red Rock Scenic Drive. (See Alternative II map, page 137.) Segment "B" would provide access to Pine Creek and the Blue Diamond Highway. The Red Springs site would use the existing access.

Trails could be developed for access into part of the area. The following trails would be built: Front Trail, Foxtail/Skyline Trails. This will form a loop system above and below the escarpment. A trail would be built across the Calico Hills between Sandstone Quarry and Red Springs. Any abandoned roads offering recreational value could be converted to trails instead of being completely rehabilitated. Examples of such roads would be the ones into Calico and Ash Creek Springs.

Limited development above the escarpment would mean development into the Rams Head area from the south on highway 16 with the related support facilities as planned for that area, i.e. overlooks, viewpoints, campgrounds, picnic sites, and trail heads. With this alternative there will be no administrative facility at Mountain Springs. However, a contact station would be developed on the entrance road to Rams Head Guard Station to control use, collect fees, and guide and inform the public.

The road would end at the Rams Head area with the Skyline Trail leading north and connecting with La Madre Canyon facility and the Foxtail Trail leading south connecting with highway 16 and the Front Trail.

ALTERNATIVE II



PROPOSED DEVELOPMENT

- 1 RED ROCK & LA MADRE CANYONS
- 2 WHITE ROCK
- 3 SANDSTONE QUARRY
- 4 RED SPRINGS
- 5 INTERPRETIVE CENTER
- 6 BLUE DIAMOND ADM.

LEGEND

- 7 PINE CREEK
- 8 RAMS HEAD
- 9 DUMP
- 10 RAMSHED GUARD STATION
- PROPOSED ROAD
- PROPOSED TRAIL
- EXISTING ROAD

MAP
NO.
14

THE UNMITIGATED ENVIRONMENTAL IMPACTS OF PROPOSED ACTION UNDER
ALTERNATIVE II

This section will discuss the impacts of action as if no mitigating measures are taken.

The intent of this alternate is to eliminate road construction from the White Rock area above La Madre Canyon to Rams Head, west of and above the escarpment, that would have caused significant environmental damage.

The only developments would be at the major focal points or recreation opportunities. There would be no development of areas having limited benefits that were being proposed due to the fact an opportunity did exist and access or development could be accomplished at little additional cost or detriment to the environment. Ice Box Canyon is a good example, since the road would go directly by the area, a small camping complex could possibly be developed. There is an opportunity here - water, geologic formation of interest and small development site; however, it is not considered the type of major attraction such as Pine Creek Natural Area or La Madre Canyon. The major opportunities would still be utilized, although a shift in the use pattern and a decrease in visitor management control would be impacted.

Physical Factors. The overall impacts on the physical features would be similar to those discussed for the proposed action. The differences would be in the degree of impacts previously discussed in the environmental impacts section. The physical factors of climate, topography and geology will be impacted as discussed under the proposed action.

Water - The sites requiring potable water would still be developed. Benefits would be generated by reduced construction

resulting in less soil movement and siltation of water sources. A direct benefit would be the reduced possibility of siltation of La Madre Spring and Reservoir, Oak Creek, Ice Box, Ash Creek and Calico Springs. This would also leave available additional natural waters for wildlife and wild burros at Oak Creek, Ash Creek and Calico Springs.

Soil - Benefits could come from reduced soil disturbance as a result of limited road construction. The only major roads developed will be the road into Rams Head area and Segment "B" of the Red Rock Scenic Drive. This alternative would eliminate the Crestline Scenic Drive Road. The Crestline Scenic Drive Road crosses a severe slope with limited soil depth, see map unit 912, page 19, and would also create excessive cuts and fills across a critical soil structure.

Adverse impacts would be generated by confining public use to a smaller area of the recreation lands. This could result in a slight increase in soil disturbance in facility development areas.

Vegetation - Benefits would be developed through reduced road construction and its related construction clearing and grubbing. Adverse impacts could develop from concentrating use to a smaller area of the recreation lands. This could cause a slight increase of vegetative trampling in the facility development areas.

Air Quality - Benefits would be slight, although there would be a reduced amount of construction dust. There would be less vehicle use, which would result in a reduction of gas and diesel fumes in the upper half of the recreation lands.

The benefits of reduced vehicle fumes would be offset by increased traffic on the Red Rock Scenic Drive and the Rams Head road.

Land Uses

Wildlife - There could be significant wildlife benefits generated by leaving a natural avenue or route of travel for bighorn sheep and deer between the escarpment and the La Madre Mountains.

This would result in a significant benefit in the amount of natural water for wildlife as unrestricted access will be available into Pine Creek, Ice Box and Lost Creek. Development would be restricted at four areas: Pine Creek, White Rock, Rams Head and Red Rock Canyon within the Bighorn Sheep habitat. There may be benefits to the Prairie falcon from decreased public access to natural nesting areas, probably to be found in the escarpment area. However, no nesting inventory has been made and this benefit cannot be verified.

An adverse effect could come from the lack of access to develop permanent water supplies to supplement natural springs.

Free Roaming Burros - Lacking definite information to the contrary it is assumed public use of the area would have little impact on the burros. There could be benefits to the burros natural range from reduced public use.

Recreation - Elimination of the Crestline Scenic Drive would change the pattern of visitor use. This change could cause both beneficial and adverse effect to the recreation opportunities. Benefits could be derived from eliminating the road as discussed in the wildlife section above as big game will have more chance to roam free. This could have effects of increasing

the chance of viewing and photographing of wildlife on the escarpment. Wildlife would also have easier access to water which could increase the chances for the public to view them at water holes.

There could be increased enjoyment at the Rams Head Overlook by designing the road so the visitor has a sudden view to the scenic attraction there.

The quality of the hunting experience would be enhanced as the seasoned hunter will have a better chance to get away from the road and the people noise. The same quality advantages would be developed for hiking and horseback riding. The trail between the Red Rock Canyon area and Rams Head will not parallel a road and there would be an increase in the experiences received from using this trail to get away from mechanical noise and investigate new territory. This trail would be approximately 10 miles in length, an easy one day walk on foot. Other spur trails are available off this main trunk.

Adverse effects could come from pattern shifts in visitor use. The area's ability to satisfy the demand for driving for pleasure could be significant. This alternative would reduce the scenic opportunity to a one loop system below the escarpment and one dead end system ending at Rams Head. The use of this dead end road at Rams Head would eliminate the possibility of a one way road system, which adds to the driving pleasure of a scenic drive. Use by scenic bus tours from Las Vegas will be reduced to a stop at the Visitor Center and lower escarpment tour instead of both lower and upper escarpment scenic opportunities. Instead of one entrance point for scenic tours, use will be generated from

two major points. This division of visitor control would reduce visitor satisfaction and increase management and protection costs. There would be significant impact on the use of the Rocky Gap and La Madre Canyon sites for public facility development. The shift of access to La Madre Canyon would cause traffic to go through the Rocky Gap site, resulting in an unsafe condition where heavy traffic passes through the middle of a recreation development instead of ending at the site. This would also result in the elimination of one of the proposed developments at Rocky Gap or La Madre Canyon. A secondary impact of this action would be the reduction of the number of usable units for camping and picnicking, which will either cause increased environmental degradation from over-use at the other site, or the public being turned away when maximum unit is reached at the site.

Visitor protection could require a high degree of control and training. Search and rescue operation will be more difficult due to the increased areas in a primitive state. Costly equipment will have to be contracted, such as helicopters. It will require more time to find lost or hurt recreationists. Fire protection will require use of hand crews instead of a faster more efficient mechanized system.

Primitive - Benefits would be contributed to the primitive values and to the user. The high value primitive zone, as mapped 002, page # 9 , in the existing situation, would not be devaluated by road construction except for a minor area at Rams Head. At Rams Head, a road and overlook would probably be established on the edge of the escarpment, inside the high primitive zone.

Primitive users would have an area large enough to get away from

the effects of man, even noise from the developed areas.

Adverse impacts could come from the primitive character of the area being difficult to maintain. Use would be extremely high and management could be limited due to regulations governing primitive management.

Basically, this close to a population center, the primitive area would be used to death. This would require management to restrict the number of visitors to the area and therefore, eliminate uncontrolled use.

Timber - Benefits would be slight since there would only be a few trees removed from the area with this alternative. There may be benefits developed by not building an overlook above the Pine Creek Natural area, thereby, eliminating massive public use directly above a unique natural area.

Urban, Suburban - Benefits will be the same as described in proposed action. This alternative would not change the impacts from those already discussed.

An adverse impact would be the increase from traffic generated on Blue Diamond and Pahrump Highways, due to elimination of the Crestline loop road systems.

Cultural Environment. Limited development of the upper area could cause different impacts to some of the cultural environments.

Antiquities - Benefits will come from non-construction of the road near or across known mesal pits thus preserving the actual site for interpretation in the Red Rock Canyon Area. Additional protection would come from reduced access to the mesal pits. There will be less chance of antiquity damage from less

construction on the lower area.

Aesthetics - Benefits to the aesthetics could be significant. Without a road across La Madre Canyon and upper Red Rock Canyon the most significant visual impact from all development would be eliminated. Road construction in La Madre Canyon and other places along the crest of the escarpment would expose large cuts and fills to viewers in the lower valley as well as those at the Visitor Center and along the Blue Diamond Highway. The construction of this segment of road would be directly opposed to the reason the Red Rock Canyon area was designated a Recreation Lands - its scenic granduer.

With development to the Rams Head area the best focal point for viewing the escarpment and the valley floor would still be available to the general public. This will also leave an undeveloped area between Rams Head and La Madre Canyon for people to explore and find their own exciting view. The opportunity to view the sandstone geologic formation close-at-hand and receive an educational interpretative story will still be available to the public at the Rams Head area, the best area for this purpose along the upper escarpment.

Road construction into Rams Head from the south is not considered difficult due to advantageous slopes, ridges and soils; therefore, road scars can be kept to a minimum. The public would still have the opportunity to experience the scenic exposure from directly under the escarpment by a mile walk from the proposed Pine Creek development area. The experience will be more enchanting than the view from the window of a car.

Some adverse impacts would be imposed on the public by this proposal. Instead of enjoying a scenic drive in a air-conditioned car, they will be forced to walk to some of the more important scenic opportunities, such as Rams Head and La Madre Canyon. An additional adverse impact would be caused from reduced public access to view the escarpment and the valley floor from various points along the crest of the escarpment. The chance to view the sandstone formation close-at-hand would be restricted to trail access, the Rams Head area, and the Red Rock Scenic Drive. There would be increased potential for wildfires in the back country. This would be due to decreased mobility and increased initial attack time for fire fighting crews. However, this may be offset by a reduction of man caused fires.

Noise and Odor - Benefits will be the reduced amount of noise and odor in isolated parts of the undeveloped areas.

Adverse impacts could be generated by confining and increasing vehicle use to a more limited area of the Red Rock area. However, this should not be significant over the noise and odor which would be generated under the proposed action.

RESIDUAL ADVERSE EFFECTS WHICH CAN NOT BE AVOIDED

The major net residue of environment impacts after mitigating measures are taken and that differ from the proposed action would be all available opportunities for recreational use will not be developed to their maximum potential. Even with development as proposed in the management plan recreational use demand would not be satisfied. This alternative of limited development will mean a reduction of the number of people accommodated because fewer sites will be developed. One of the biggest user groups to be adversely effected are those people who cannot physically use the area, i.e. those that are handicapped, or are limited by age. It is much easier for the agile to find a recreation experience by walking into the back country or going elsewhere, than it is for the handicapped. There would be a reduction in the amount of recreation and construction industry dollars contributed to the Las Vegas economy.

The following table shows the impact of this alternative on the environment, both positive and negative. A scale of high, moderate and slight was used.

TABLE I
ENVIRONMENTAL IMPACT OF ALTERNATIVE AFTER MITIGATING MEASURES

Physical Factors		Land Use		Cultural Environment	
CLIMATE	No impact	WILDLIFE	Moderate conflict	ANTIQUITIES	Slight negative impact
TOPOGRAPHY	Slightly changed	BURROS	Moderate conflict	AESTHETICS	Slight negative impact
WATER QUALITY	Slightly lower	LIVESTOCK	250 AUM's lost	NOISE	Moderate negative impact
SOIL	Slight change	WATERSHED	Slight negative impact	ODOR	Moderate negative impact
VEGETATION	Slight alteration	MINERALS	High negative impact	SOCIAL/ECONOMICS	Moderate negative impact
GEOLOGY	No change	RECREATION USE	High negative impact	POLITICAL	No impact
AIR QUALITY	Moderately lower	PRIMITIVE USE	Moderate negative impact		
		TIMBER	High negative impact		
		URBAN/SUBURBAN	High negative impact		

The following table is the overall difference between this alternative and the proposed action. Averaging all factors for a single opinion for each element of the environment differences will be shown as beneficial (better) or adverse (worse) than the proposed action on a severe, high, medium and slight scale.

TABLE II
DIFFERENCES BY TAKING ALTERNATIVE II

Physical Factors		Land Use		Cultural Environment	
CLIMATE	No Difference	WILDLIFE	Slight Benefit	ANTIQUITIES	Medium Benefit
TOPOGRAPHY	Medium	BURROS	Slight Benefit	AESTHETICS	Medium Benefit
WATER QUALITY	Slightly Adverse	LIVESTOCK	No Difference	NOISE	Slightly Adverse
SOIL	Slight Benefit	WATERSHED	Slight Benefit	ODOR	Slightly Adverse
VEGETATION	Slight Benefit	MINERALS	No Difference	SOCIAL/ECONOMICS	Highly Adverse
GEOLOGY	No Difference	RECREATION USE	Highly Adverse	POLITICAL	No Effect
AIR QUALITY	Slight Benefit	PRIMITIVE USE	Medium Benefit		
		TIMBER	Slight Benefit		
		URBAN/SUBURBAN	Highly Adverse		

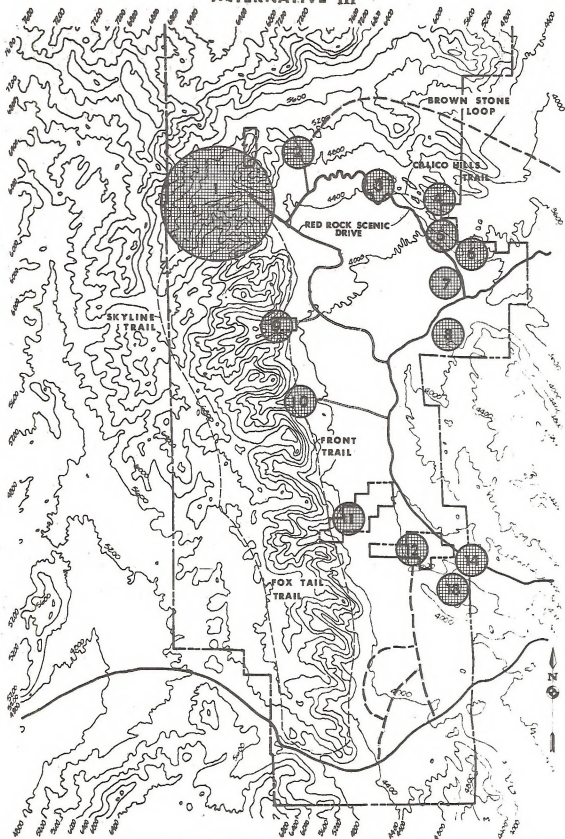
ALTERNATIVE III

FULL DEVELOPMENT BELOW THE ESCARPMENT WITH ONLY

PRIMITIVE DEVELOPMENT ABOVE THE ESCARPMENT

Full development would be planned on the lower escarpment as was described in the proposed action. Primitive management on the upper escarpment means no structure or road development. The only development would be foot and horse trails. These trails would be limited to the Skyline and Foxtail trails connecting with the Front Trail at State Highway 16 and La Madre Canyon/Red Rock Canyon Area. (See Alternative #3 map, page 149). Associated with these trails would be trail head parking and primitive sanitation facilities along the trail to protect the user and the environment. There could be primitive development of water devices to provide potable water at manageable locations. Signs would be provided for directions and safety, with no information or interpretative signs.

ALTERNATIVE III



PROPOSED DEVELOPMENT

- 1 RED ROCK & LA MADRE CANYONS
- 2 WHITE ROCK
- 3 SANDSTONE QUARRY
- 4 ASH CREEK
- 5 CALICO SPRINGS
- 6 RED SPRINGS

LEGEND

- 7 INTERPRETIVE CENTER
- 8 BLUE DIAMOND ADM.
- 9 PINE CREEK
- 10 OAK CREEK
- 11 LODGE ZONE
- 12 DUDE RANCH

- 13 DUMP
- 14 CONTACT STATION

- PROPOSED ROAD
- PROPOSED TRAIL
- PROPOSED DRY TRAILS
- EXISTING ROAD

MAP

NO.

15

THE UNMITIGATED ENVIRONMENTAL IMPACTS

This section will discuss the impacts of this alternative as if no mitigating measures are taken. Only those impacts that differ from the proposed action will be discussed. The impacts of full development below the escarpment have been fully discussed in the proposed action, and will not be reiterated here. The discussion will focus in on the impacts of primitive management and development west of the escarpment. Where this action would have a different impact on the lower area, the impact will be discussed.

The intent of this alternative is to leave an area in its natural state, so the public can enjoy a primitive contact with the environment. This could cause both benefits and adverse impacts to the environment as well as the Socio/economic situation.

Physical Factors

With this alternative the physical factors of climate, topography and geology would be impacted the same as discussed under the proposed action.

Soil, vegetation and water quality - Benefits from no road construction and limited use west of the escarpment would be generated since there could be no soil and vegetation disturbance or removal. This should directly benefit water quality by eliminating the chance for increased siltation and pollution of the water courses as a result of leaving the head water areas in their natural conditions there would be no further disturbance of the soils from trail construction because the trail up out of La Madre Canyon can follow the existing primitive road. It is important to limit construction in a severe soil structure (see soils map, unit 912 page 19).

Adverse impacts would be slight in the upper area. However,

increased impacts could develop on the lower areas. People would still use the upper area. This could cause an impact on the soil, vegetation and water just by using the area without facilities. The environment can tolerate some use, but the use that could be generated this close to a major population center would be high. To use the upper area, people would have to campout at various locations. Most of the use will be at focal points or high interest areas, such as a prominent scenic overlook, like Rams Head or near the convenience of water. This concentration of use could cause vegetation denudation, soil disturbance and surface pollution. The site degradation would be the result of pitching tents, digging fire pits, cutting fire wood, and from people leaving human wastes nearby. Not all users would carry out their garbage, adding to the pollution of the soil and water. There would be an adverse impact from the concentration of larger user groups visiting the lower area.

Air Quality - Benefits would be slight in the upper area as a result of no construction. There would be no vehicle dust or fumes from gas and diesel motors here.

Adverse impacts could come from the increased traffic of the Red Rock Scenic Drive. Increased use at developed sites could cause vegetation and soil disturbance resulting in higher frequency of dust particles in the air.

Land Use

Wildlife - Benefits could be high to wildlife. This would result from leaving over half the total area in an unaltered condition and allowing natural processes to continue. Wildlife would have free movement to water areas in the escarpment area and winter ranges on part of the lower area. There could be benefits to the Prairie

falcon from decreased public access to natural nesting areas. Adverse impacts which could effect wildlife would be the number of people using the area. People will infringe on the wildlife natural habitat, thus driving them into infrequently used locations. This could drive big game out of the Red Rock Area. This is particularly true as increased hunting pressure develops. Without mechanical access, developed or improved water supplies would not be constructed to supplement natural springs.

Free Roaming Burros - Benefits could undoubtedly be generated by allowing natural processes to continue on more than half the area. Adverse impacts could come from the species itself. We cannot say for sure, as little is known about burros. If the same circumstances develop as did at the Death Valley National Monument, the burros could over populate the area. This would destroy their range, and cause a severe impact on the big game. Burros are evidently tolerant of humans and in their wild state and could inflict harm to innocent people.

Livestock - Adverse impacts could develop between people and livestock in the lower area. Some people do not understand livestock use and could be quick to criticize when and where livestock concentrate around camping and picnic sites. Public pressure could eventually eliminate grazing from much of the area.

Watershed - Benefits will come from the new closure of the area to trails not designated for ORV use. Without indiscriminate use the undesignated ORV trails will heal and the watershed should improve in the future.

Adverse--the degradation around the developed site could cause watershed loss but would be slight compared to the total picture.

The ORV restriction would improve the watershed. However, these restrictions could be hard to enforce due to the size of the area and number of users in the Las Vegas Valley. Most of the indiscriminate use could be generated away from the developed areas along the west side of the Red Rock Area out of Lovell Canyon and Mountain Springs.

Mineral - There should be little change in the mineral use from the area. There undoubtedly will be increased demands to allow sand, gravel and building stone removal from select sites of the area.

Recreation - Benefits and unfavorable reactions could be mixed-- i.e. increased value to some recreation opportunities with decreased value with others.

Benefits - The most significant benefit would be to the primitive values, (Read primitive discussion below.) There could also be benefits to the scenic value through protecting the more significant area from construction scars. (Read aesthetics discussion in cultural section.)

By eliminating road and facility development on the upper area, most of the public use would shift to the area below the escarpment. This could benefit wildlife. It could also increase the opportunity for people to view and take photographs of big game on the escarpment. Wildlife would also have better access to water which would increase the chance for the public to view sheep, deer and burros.

The quality of the hiking and horseback riding experiences would increase. This would be the result of trails (Foxtail and Skyline) providing access into areas without mechanized access. Trail users would be able to get away from mechanized noise and have a feeling

of investigating new territory. These trails would be approximately 18 miles in length with additional trail opportunities into the La Madre Mountain and on out of the Red Rock area to the Toiyabe National Forest. This would add greatly to the experiences of the public user.

The quality of the hunting experiences could increase as the hunter will be able to get away from the roads, people, and their related noises. However, this will be short term. Over the long term period, if the number of hunters increase, quality will decrease (see discussion below).

Adverse effects could come from shifts in the visitor use patterns. The area would not satisfy the driving for pleasure needs that it has the potential for. The greatest visitation expected was to come from daily scenic tours out of Las Vegas. The scenic opportunities were the specific purpose of the two loop roads, (see map No. 3 page 7). These loops were to move people through the Red Rock area, both below and above the escarpment. This alternative would reduce the scenic road opportunities to the area below the escarpment. People in tour busses would not experience the total scenic and geologic situation. The general public would not be able to camp and picnic in the cooler environment offered on the upper area. This experience would be available to a limited number of recreationists who have the ability and equipment to backpack. Visitor protection would require a higher degree of control and training. Search and rescue operation could become more difficult due to limited access and the primitive nature of the upper area. Costly equipment will have to be used, more time will be required to find lost or injured recreationists.

Fire protection will require use of hand tooled fire fighting crews instead of a faster more efficient mechanized system. This may be offset by reduced man caused fires as a result of less use.

There would be increased use in the lower area from lack of use dispersement throughout the entire area. There could be a significant negative impact on the use of the Rocky Gap and La Madre Canyon sites for public facility development. The shift of access to La Madre Canyon would cause traffic to go through the Rocky Gap site. This could cause an unsafe condition where traffic passes through the middle of a recreation development instead of ending at the entrance to the use site. Undoubtedly this will eliminate one of these proposed campground developments. This could cause a secondary impact by reducing the number of usable units (camp area) which will either cause increased environmental degradation from overuse at the other sites or the public being turned away when maximum unit use is reached. People may use undeveloped sites, with new undeveloped sites being added each year. Use can be expected to be high in La Madre Canyon off the end of the road. This area has a natural tree cover and provides shade and privacy. This increased use could cause site pollution from litter, garbage and human waste. Natural vegetation as well as facilities may be stripped and used for firewood. The frequency of man-caused fires could increase. The quality of the hunting and general leisure experience could decrease directly with the increased number of people. Heavy hunting pressure would cause a public hazard even away from the developed areas and control of some type will be necessary. Only a limited number of people would be allowed to use the area directly proportioned to the number of facilities

developed on the lower area. Management restrictions will be necessary to protect the environment as well as the visitor. Regulation and/or restrictions such as site closures, use zoning, permit system, fee charges and time limits will be applied to control use within the area's natural carrying capacity. This will be true of both the lower area and use of the primitive area west of the escarpment. Restriction could be very unpalatable to the public and decrease the quality of their experience. Only a limited number of people would be able to enjoy the upper area. Vandalism could increase due to people's increased frustration and venting their hostility on the existing facilities, vegetation, natural features and possibly other users.

The overall quality of the recreation experience could decrease over a long period of time due to gradual deterioration of the natural features and the area.

People and user groups rights could be infringed upon by other people and user groups and dissatisfaction would develop with the way individuals are allowed to use the area.

Primitive - Benefits would be directly associated with no construction west of the upper escarpment. This will leave the upper area in its present condition. The area would also have the benefit of the ORV closure that will reduce disturbance to the vegetation, soil and aesthetical qualities. All of the high value primitive zone as mapped 002, page 58, would be protected. (Primitive users will be able to get away from the effects of man.) The individual will be able to enjoy nature, ecology and the natural environment at-first-hand. This may be a very unique experience considering the scenery, geology and location of the upper area west and north

of the escarpment. Should hunting be eliminated, an additional experience with big game species could develop.

Adverse impacts may come from the lack of management control. The impact of people themselves can be and is severe. Littering, vandalism and pollution would accelerate proportionately with increased use. Major management efforts would have to be concentrated in the area east of the escarpment leaving the upper area much to the public's own discretion. Man-caused wild fires are sure to increase without protective facilities. There could be illegal ORV use particularly in the upper area away from the management people all of which could slowly deteriorate the primitive qualities of the area. The increased number of people throughout the area could reduce the chance for solitude held as a high virtue by primitive lovers. The primitive character of the area would be difficult to maintain. Basically, this close to a population center, the primitive area will be over-used. To prevent this high visitor use, limits may have to be applied by controlling use through a permit system. A secondary impact that needs to be considered is the justification for the area as a primitive area considering the number of these proposals and acreage being considered on a regional basis, see pages 11 and 12.

Timber - Benefits would be slight. There will be no construction and no removal of trees.

Adverse impacts could come from increased vegetation vandalism and man-caused fires.

Urban-Suburban - Benefits would still be generated to the Urban-Suburban setting by providing a scenic open space next to an expanding community, highlighted by a primitive experience.

Adverse impacts would be associated with the inability of the area to help satisfy the recreation demands of an urban area.

Cultural Environment.

No development of the upper area could cause different impacts to the cultural environment.

Antiquities - Benefits would develop by not disturbing the cultural features through construction actions, particularly to the known mesal pits in the Red Rock Canyon. Additional protection would be provided by less access to antiquities values there.

Aesthetics - Benefits to the aesthetics could be significant. Without road access across the upper escarpment the most significant negative visual impact will be eliminated. Road development in La Madre Canyon and open places along the crest of the escarpment would have exposed large cuts and fills to viewers from the lower valley, the Visitor Center, and Blue Diamond Highway. The construction of this road would be directly opposed to the reason the area was designated the Red Rock Canyon Recreation Lands - its scenic grandeur.

People would still be able to experience the scenic, awe - inspiring setting by walking along the upper escarpment. This way they will be able to view the sandstone formation close-at-hand. There would be increased aesthetical pleasure by leaving more of the area in its natural condition. People would have limited access and the major littering and vandalism will be confined to the lower area. Adverse impacts would be caused from reduced public access to view the escarpment and valley floor from the escarpment. There would be very limited use of the best scenic attraction in the area, the Rams Head site. The only access to the upper escarpment would be

by trail. Handicapped and people limited by age would not be able to gain the experience of this scenic setting.

Noise and Odor - Benefits could come from the reduction of area effected by noise and odor. Noise and odor from vehicles should be totally eliminated from the upper area.

Adverse impacts could be generated by confining vehicle use to the lower area. However, this might not be much different from the amount already being generated by the proposed action.

Socio/economics - Benefits would be limited by this alternative.

Adverse effects could come from less being contributed to the economy of the Las Vegas tourist and construction industry.

RESIDUAL ADVERSE EFFECTS WHICH CANNOT BE AVOIDED

The major net residue of environmental impacts after mitigating measures are taken, and that differ from the proposed action, is a matter of opinion. The question is recreation development vs. primitive management. Both uses are good. Maximum primitive management would cause less environmental damage. Likewise, the recreation demand for facilities and an area to drive for pleasure are high. This alternative would not satisfy this demand and the demand generated by the majority of the people would not receive fair consideration.

This alternative would require less construction and provide fewer use sites. There would be a reduction in the amount of economic returns to the community. Tourists will spend their money elsewhere since there will not be a significant attraction at the Red Rock area. The recreation construction dollars available would not be spent in the Las Vegas area.

Fewer handicapped and people restricted by age would be able to use the upper areas.

The following table shows the impact of this alternative on the environment, both positive and negative. A scale of high, moderate and slight was used.

TABLE I
ENVIRONMENTAL IMPACT OF ALTERNATIVE AFTER MITIGATING MEASURES

Physical Factors		Land Use		Cultural Environment	
CLIMATE	No impact	WILDLIFE	Slight conflict	ANTIQUITIES	Moderate negative impact
TOPOGRAPHY	No change	BURROS	Slight conflict	AESTHETICS	Slight negative impact
WATER QUALITY	Slightly lower	LIVESTOCK	250 AUM's lost	NOISE	Moderate negative impact
SOIL	No change	WATERSHED	Slight negative impact	ODOR	Moderate negative impact
VEGETATION	Slight alteration	MINERALS	High negative impact	SOCIAL/ECONOMICS	Slight negative impact
GEOLOGY	No change	RECREATION USE	Moderate negative impact	POLITICAL	No impact
AIR QUALITY	Moderately lower	PRIMITIVE USE	Moderate positive impact		
		TIMBER	High negative impact		
		URBAN/SUBURBAN	Moderate positive impact		

The following table is the overall difference between this alternative and the proposed action. Averaging all factors for a single opinion for each element of the environment differences will be shown as beneficial (better) or adverse (worse) than the proposed action on a severe, high, medium and slight scale.

TABLE II
DIFFERENCES BY TAKING ALTERNATIVE III

Physical Factors		Land Use		Cultural Environment	
CLIMATE	No Difference	WILDLIFE	Medium Benefit	ANTIQUITIES	Medium Benefit
TOPOGRAPHY	Medium Benefit	BURROS	Medium Benefit	AESTHETICS	High Benefit
WATER QUALITY	Medium Benefit	LIVESTOCK	No Difference	NOISE	Slight Benefit
SOIL	Medium Benefit	WATERSHED	High Benefit	ODOR	Slight Benefit
VEGETATION	Medium Benefit	MINERALS	No Difference	SOCIAL/ECONOMICS	Slightly Adverse
GEOLOGY	No Difference	RECREATION USE	Slightly Adverse	POLITICAL	No Change
AIR QUALITY	Slight Benefit	PRIMITIVE USE	Medium Benefit		
		TIMBER	No Difference		
		URBAN/SUBURBAN	Medium Benefit		

ALTERNATIVE IV

NO FURTHER ACTION

This section will discuss the impacts of no action as if no mitigating measures are taken. (See Alternative IV map, page 163 for reference to existing facilities.)

The intent of this alternative is to show what the anticipated environment would be like without any further recreation development. The area would remain in Federal ownership. It is assumed that the present natural and cultural forces will continue to impact the area, including increased recreational use of the land. This alternative would have serious significant impacts on the recreational opportunities of the Red Rock Canyon area. Not only would the recreational demands not be satisfied, some would probably be lost or reduced from insufficient public controls.

The environmental situation would be the same as is discussed in detail in the section on Description of the Environment. What will be discussed below is the significant impacts of the area which are beneficial or adverse.

Physical Factors

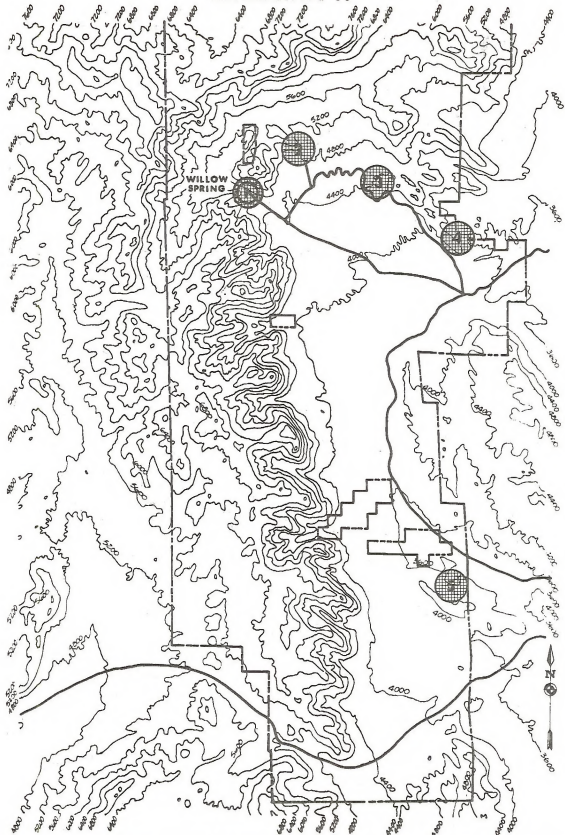
The alternative of no action would result in little or no significant change in the climate, topography, and geology.

Soil, Vegetation - Benefits from no construction would result in a stable soil and vegetation situation in the remote areas.

Natural processes would continue where there is very little disturbance.

Adverse impacts would be significant at all existing sites along the Red Rock Scenic Drive. Soil compaction, surface disturbance, and vegetation loss could result from people using every available

ALTERNATIVE IV



EXISTING SITES

1 WILLOW SPRINGS

2 WHITE ROCK

LEGEND

3 SANDSTONE QUARRY

4 RED SPRINGS

5 DUMP

MAP
NO.
16

site beyond natural carrying capacity. New use sites could develop due to overflow. Overuse results in site degeneration and final denudation. Wind and water erosion would result.

Water Quality - Benefits would be derived from the existing water, both surface and groundwater, not being utilized and therefore being available for other purposes.

Adverse impacts would come from the increased erosion at the existing sites. The wind and water erosion will carry soil particles into the surface water causing siltation.

Air Quality - Benefits may be developed by a reduction in traffic volume. The reduced traffic would lower the amount of fumes from gas and diesel vehicles in the area.

Adverse impacts would be generated from dust being picked off the denuded areas by the wind. Dust would also be generated from traffic on the gravel surface portion of the Red Rock Summit Drive Road adding additional dust sources to the air.

Land Uses

Wildlife, Wild Burros - Benefits could come from allowing natural processes to continue unaltered.

Increased public use could have an adverse impact on wildlife. The number of people using the area could drive the big game species back further from access points and possibly from natural water sources.

Little is known about burros, but if the same circumstances develop as did at Death Valley National Monument the burros could over populate and destroy their range.

Livestock - Benefits could result from livestock being able to continue using the area as in the past.

Adverse impacts could develop between people and livestock. Some people do not understand livestock use and could be quick to criticize when and where livestock are congregating around their camping and picnic sites.

Public pressure could eventually eliminate grazing from much of the area. This shouldn't be too significant, considering the amount of existing grazing.

Watershed - Benefits would come from the new closure of the area to undesignated ORV trail use. Without indiscriminate use the undesignated ORV trails will heal and the watershed should improve in the future.

Adverse--the degradation around the developed site could cause watershed loss but this would be slight compared to the total picture. The ORV restriction will improve the watershed. However, these restrictions could be hard to enforce due to the size of the area and number of users in the Las Vegas Valley. Most of the indiscriminate use would probably be generated away from the developed areas along the west side of the Red Rock Area out of Lovell Canyon and Mountain Springs.

Mineral - There should be little change in the mineral use from the area. There undoubtedly will be increased demands to allow sand, gravel and building stone removal from select sites of the area.

Recreation - Benefits associated with no further action would be used by the public on an uncontrolled-free movement basis. However, this could be short lived due to the environmental damage which could be caused by uncontrolled recreation use utilizing the area beyond its normal carrying capacity. See adverse

impacts below.

Adverse impacts on the recreation opportunities could be severe. Demand exceeds supply now. There are only 20 picnic units at Willow Springs available for an estimated demand of 600,000 visits. The three use sites at White Rock, Sandstone Quarry, and Red Springs have no facilities except a parking area or turnaround. Uncontrolled use is being experienced with its associated pollution, littering and site vandalism.

Assuming that the twenty picnic units would be used at maximum capacity and, estimating four people per party, two parties a day for 300 days a year, this would satisfy 48,000 visits. Use would soon develop beyond the carrying capacity of the area. People would use undeveloped sites, with new undeveloped sites being added each year. Use can be expected to be high in La Madre Canyon off the end of the road. This area has a natural tree cover and provides shade and privacy. With this increased use would come site pollution from litter, garbage and human waste. Natural vegetation as well as facilities may be stripped and used for firewood. Man-caused fires would increase. The quality of the hunting experience could decrease directly with the increased number of people. This includes increased number of hunters as well as general leisure time recreationists. Heavy hunting pressure could cause a public hazard even away from the developed areas.

Controls of some type would be necessary. Only a limited number of people would be allowed to use the area and use could be determined by the number of available facilities. Management restrictions would be necessary to protect the environment as well as the visitor. Regulation and/or restrictions such as: site closures,

use zoning, permit system, fee charges, and time limit could be applied to control use within the area's natural carrying capacity. These restrictions could be very unpalatable to the public and decrease the quality of their experience. Fewer people would be able to enjoy the area.

The overall quality of the recreation experience would likely decrease over a long period of time due to gradual deterioration of the natural features and the area.

People and user groups rights could be infringed upon by other people and user groups. Dissatisfaction with the way individuals can enjoy the area would develop.

Primitive - Benefits would be directly associated with no construction west of the upper escarpment. This would leave the upper area in its present condition. The area will also have the benefit of the ORV closure that will reduce disturbance to the vegetation, soil and aesthetical qualities.

Adverse impacts may come from the lack of management control developed through providing recreation facilities. The impact of people themselves can be and is severe. Littering, vandalism and pollution could accelerate proportionately with increased use. This would spread to all parts of the area.

Major management efforts would have to be concentrated in the area east of the escarpment leaving the upper area much to the public's own discretion. Man-caused wildfires are sure to increase without protective facilities. There could be illegal ORV use particularly in the upper area away from the management people. All this will slowly deteriorate the primitive qualities of the area. The increased number of people throughout the area would reduce the

chance for solitude held as a high virtue by primitive lovers.

Timber - Benefits would be high since there will be no trees removed under this alternative.

Adverse impacts could come from increased vegetation vandalism and man-caused fires.

Urban-Suburban - Benefits would still be generated to the Urban-Suburban setting by providing a scenic open space next to an expanding community.

Adverse impacts could be associated with the inability of the area to help satisfy the recreation demands of an urban area. A regional type park left only in an open space category would contribute little to the community needs.

Cultural Environment

Antiquities - Benefits would be moderate as no sites or intrinsic value would be lost due to construction.

Adverse impacts would be moderate also. The public would not receive the benefit of interpretation and education as to an understanding and the value of historical and archeological site. This I&E is the key to reducing ignorant destruction of antiquities values.

Aesthetics - Benefits from leaving the area as is would be slight. Certainly a natural condition is aesthetically pleasing. There would be no further construction to mar the landscape. People would have limited access so the major littering, vandalism and pollution would be confined to areas near developments.

Adverse impacts are going to be significantly severe. Overuse would cause environmental deterioration. Vegetation and soil would be trampled and disturbed, killing out plants resulting in

site denudation. People could go everywhere using every available area to camp, picnic, whatever, in the desire to relax and use the "Park." Management regulation and restriction would be necessary to protect both people and the environment which could in turn cause animosity and result in some area and facility vandalism. Litter and area pollution could gradually increase beyond maintenance capabilities. Site or partial area closure would be the rule instead of the exception.

Noise would increase around developed areas as well as odor from vehicles. Parking problems would develop and traffic jams or blocked cars would frustrate the public.

RESIDUAL OF ADVERSE EFFECTS WHICH CANNOT BE AVOIDED

The major net residue of environment impacts that could remain after mitigating measures are taken would be the reduction in use and enjoyment the public will receive.

Management techniques to direct use into controllable areas would not be allowed; i.e. campgrounds, toilets, trails and roads. This leaves management with the only alternate of controlling use either by permit or site and area closure. As discussed previously this leaves a bad feeling in the public, particularly when a family goes out for a picnic and are told, sorry no room--"Area Closed." This creates additional impact by forcing use on other areas away from Red Rocks. The amount of use demand the Red Rock area can and should absorb would not be met. Under this alternative, this would be an unavoidable impact on the public because we cannot manage the area to allow environmental degradation.

National policy and Red Rock Canyon Recreation Lands dedication direct environmental protection.

Economics of the no further action alternative could be significant. Tied to the fact that public use would not be generated is the amount of money tourists would spend elsewhere. Red Rock Canyon Recreation Lands is a significant attraction and with development would attract not only local residents but out-of-State tourists. The traffic generated by bus tour groups can be significant but would go untapped with no return to the local tourist industry. Also available to the local community would be the direct construction dollar that will be spent elsewhere.

No environment education and interpretation would be available without development of the Visitor Center and roadside displays. This would

have a twofold impact. First, environmental awareness developed through this I&E (Information and Education) program is essential to environmental protection. Second, without I&E, misuse and ignorant damage would continue to the point that values would be lost to everyone. This would extend not only to the Red Rock Canyon area but to other areas the public would visit that could benefit by public environmental awareness.

The following table shows the impact of this alternative on the environment, both positive and negative. A scale of high, moderate and slight was used.

TABLE I
ENVIRONMENTAL IMPACT OF ALTERNATIVE AFTER MITIGATING MEASURES

Physical Factors		Land Use		Cultural Environment	
CLIMATE	No impact	WILDLIFE	No change	ANTIQUITIES	Slight negative impact
TOPOGRAPHY	No change	BURROS	No change	AESTHETICS	Slight negative impact
WATER QUALITY	High loss in quality	LIVESTOCK	No change	NOISE	Slight negative impact
SOIL	Moderate negative impact	WATERSHED	Slight negative impact	ODOR	Moderate negative impact
VEGETATION	Moderate negative impact	MINERALS	Moderate negative impact	SOCIAL/ECONOMICS	High negative impact
GEOLOGY	No change	RECREATION USE	Highly severe negative impact	POLITICAL	Public concern for action
AIR QUALITY	Slightly lower	PRIMITIVE USE	Moderate negative impact - ions run		
		TIMBER	Moderate negative impact		
		URBAN/SUBURBAN	High negative impact		

The following table is the overall difference between this alternative and the proposed action. Averaging all factors for a single opinion for each element of the environment differences will be shown as beneficial (better) or adverse (worse) than the proposed action on a severe, high, medium and slight scale.

TABLE II
DIFFERENCES BY TAKING ALTERNATIVE IV

Physical Factors		Land Use		Cultural Environment	
CLIMATE	No Difference	WILDLIFE	Slight Benefit	ANTIQUITIES	Highly Adverse
TOPOGRAPHY	High Benefit	BURROS	Slight Benefit	AESTHETICS	Slight Adverse
WATER QUALITY	Moderately Adverse	LIVESTOCK	High Benefit	NOISE	Slight Benefit
SOIL	Moderately Adverse	WATERSHED	Slightly Adverse	ODOR	Moderately Adverse
VEGETATION	Medium Adverse	MINERALS	High Benefit	SOCIAL/ECONOMICS	Highly Adverse
GEOLOGY	No Difference	RECREATION USE	Severely Adverse	POLITICAL	Highly Adverse
AIR QUALITY	Slightly Adverse	PRIMITIVE USE	Highly Adverse		
		TIMBER	High Benefit		
		URBAN/SUBURBAN	Highly Adverse		

ALTERNATIVE V

RESTRICT USE TO DAY USE ONLY

Under this alternative the area would be used only as a day use site. There would be no overnight camping.

This alternative is not really a different development scheme but a management alternative, a different philosophy of use. It could apply to all or part of this area.

The environmental impacts and the mitigating measure would be similar to those discussed under the proposed action or each alternative. This alternative can be applied to each of the possible alternate action. Construction impacts would also be similar as picnic units, toilets, roads, trails, visitor center, interpretative displays, operations and maintenance would still be needed. The only use that would be eliminated would possibly be the Dude Ranch.

This alternative could be less restrictive. Overnight use is desirable in a primitive area and the day use philosophy would apply only to developed sites.

Overall benefits would be generated toward vegetation, soil, water, wildlife, burros and watershed. This would result from lower intensity of use and balancing natural environmental needs with public demand. For example, wildlife could utilize water resources at night without interference. The same area would still be usable for public recreation during the light hours.

The adverse impacts would mainly be in recreation, urban, suburban, and socio/economic factors. This would result from the reduction in total use below potential and the frustration resulting from major user groups, such as (campers) not being satisfied.

The management alternative would give better and more defined visitor use control, easier and more efficient maintenance and perhaps a higher quality experience.

ALTERNATIVE VI

MANAGEMENT AND DEVELOPMENT BY

ANOTHER AGENCY OR A PRIVATE CORPORATION

This alternative would result in turning over recreation management and development to the State, County, or even placing out on prospectus for bid by private interests.

Management of the Red Rocks Complex, similar to this alternate, was previously pursued with the State Parks, and by agreement, was consummated in 1969 to cooperatively manage and develop the area. This agreement is still in effect. Private interest in management and development of the total area has not been considered.

Considering the (1) existing recreation opportunities and development, (2) further management needs and development, and (3) the objectives, impacts and alternatives presented in this Environmental Statement -- the results of the environmental impacts would be the same under any administering agency or private interest. The major environmental impacts to contend with would still be increased public use pressures and actual facility construction. The existing plan of management is a State Parks-BLM cooperative approach and may differ upon exposure of the EIS to the public. Further, management techniques may vary between agencies, etc., even in carrying out the decisions which may result from this EIS.

As indicated above, management and development impacts should parallel readily for Federal and State agency administration. However, management and development by a private corporation may create additional impacts on social values as a result of the public losing control because of a definite set plan within specific contract terms.

Again, under the objectives, impacts and alternatives presented in this

draft EIS,--the administering agency should not result in significant environmental changes. Variations can be expected in administrative procedures in carrying out the final action plan determined upon analysis of this EIS.

CONSULTATION AND COORDINATION WITH OTHERS

This section contains the recordation of minutes of meetings, consultations, and comments received from the various individuals and groups who have been involved to date in the discussion of a management plan for the Red Rock Canyon Lands.

1. June 9, 1964 - A meeting was held at the Thunderbird Hotel to discuss a plan for the Red Rocks. A working committee was organized with the following people assigned as members:

BLM - Euel Davis

BSF&W - Newell Morgan

Clark County - Elmer Anderson

State of Nevada - Al Jones

In September, Dennis Hess replaced Euel Davis as Chairman of the working committee. Mr. Hess replaced Mr. Davis in August 1964 as District Manager of the Las Vegas District.

2. September 1964 - Questionnaires on development and management of the Red Rock area were published in newspapers and distributed to the public by various groups, which included the Sierra Club and the League of Women Voters. A total of 3,300 questionnaires were returned, and of these, 90%

were in favor of recreation development.

3. March 1, 1965 - The subcommittee report was submitted.

The following is a summary of the subcommittee recommendations:

- a. The Bureau of Land Management is the logical agency to administer, develop and maintain the recreation resource of the Spring Mountains Planning Unit.
- b. The Planning Unit has scenic, scientific and historic values of significance to the entire nation.
- c. Recreation complex boundaries will not be established until the recreation inventory is complete.
- d. Drilled wells should be planned for future recreation sites to enhance the recreation values and increase water for wildlife.
- e. The Bureau of Land Management should acquire the necessary water rights for utilization and development of the recreation and wildlife resources.
- f. Domestic livestock grazing should not be increased to utilize any water rights which may be acquired.

- g. The subcommittee supports the timber stand improvement projects proposed by the Bureau of Land Management for Job Corps enrollees.
- h. Mining should be excluded from high value recreation lands in the Unit, and other high value recreation lands should be identified and protected.
- i. Grazing rights in the Unit should not be increased and the possibility of eliminating grazing in the future should be considered.
- j. The subcommittee supports wildlife habitat improvement projects proposed by the Bureau of Land Management for Job Corps trainees--with the reservation that livestock privileges are not increased to utilize increased forage.
- k. The Red Rock Canyon portion of the Unit should be classed as a Recreation Area within the Recreation Complex.
- l. The Bureau of Land Management application for protective withdrawal of some portions of the Red Rock Canyon Area should be approved.

- m. The Red Rock Canyon Scenic Drive should be paved and include a spur and scenic overlook of the Las Vegas Valley.
- n. Wheeler Wash Road from Pahrump to Cold Creek via Wheeler Pass should be improved at an early date to facilitate movement of Job Corps trainees.
- o. The Nevada State Highway Department should improve the Wheeler Wash Road (Route 52) and the Red Rock Canyon Scenic Drive (Route 85); or, remove the route designations so that the Job Corps and Bureau of Land Management can do the necessary improvement work.
- p. The Bureau of Land Management should negotiate to acquire 360 acres of key recreation lands within the Planning Unit which are now in private ownership.
- q. Consideration should be given to the earliest possible establishment of a Job Corps camp in the vicinity of Cold Creek within the Planning Unit.
- r. The proposed Red Rock Canyon Recreation Area should receive highest priority for early development because of its proximity to Las Vegas and the great need for immediate sanitation protection measures.
- s. Clark County should assume the leadership in cleaning up and stopping dumping of litter along access routes to

the Unit, and zone these routes against tourist trap developments.

- t. Clark County should take the necessary steps to insure the earliest possible paving of the West Charleston extension to Blue Diamond, named the Red Rock Front Scenic Drive by the Subcommittee.
- u. Land within the Planning Unit should not be considered for patent or lease under the Recreation or Public Purposes Act to private groups, public groups or local or national organizations.
- v. The Bureau of Land Management should negotiate with the Frontier Girl Scouts to secure a withdrawal of their application for patent to 80 acres of key recreation lands in the Red Springs area. Granting of this patent would be inconsistent with the Subcommittee recommendation to acquire 360 acres of key private lands in the Unit - 160 acres of which adjoin the Red Springs site.
- w. The parent committee should also ask the Girl Scouts to withdraw the Red Springs application.
- x. The Bureau of Land Management should consider possible Recreation or Public Purposes applications within the Unit for development of a public museum and outdoor concert shell. These developments could best be administered by Clark County.
- y. The Bureau of Land Management should prepare to take

over the improvement, operation and maintenance of the Willow and Cold Creek recreation sites which are now administered by the Bureau of Sport Fisheries and Wildlife.

- z. The Provisional League of Women Voters report, "Recreation Survey of Las Vegas, Nevada" should be accepted and used as being indicative of local recreation demands.
- aa. The Subcommittee recommends that the Bureau of Land Management initiate an active directional, informational and protective sign program within the Planning Unit.
- bb. The lands classified for disposal under the Small Tract Act in T. 22 S., R. 58 E., Section 11, should be declassified; and no additional "Small Tract" lands within the Planning Unit should be classified in the future.
- cc. The U. S. Forest Service and Bureau of Land Management should coordinate trail building efforts to form a complete trail network in the Unit.
- dd. A Master Plan should be developed for the overall development and programming of the Red Rock Canyon - Spring Mountains Recreation Complex; and, the plan, services, detailed drawings, revisions, reports and declarations of intent shall be maintained and revised by the agency held responsible for the development of the area.

At a committee meeting conducted by BLM State Director, Russell Penny, all of the above recommendations were approved.

4. April 1, 1967 - State of Nevada passed a resolution authorizing the purchase of lands in the Red Rocks. One hundred thirty-two thousand dollars (\$132,000) was designated for this purpose.
5. August 1967 - Planning team designated and announced at a Red Rock Canyon Recreation Lands Master Plan meeting held August 24, 1967. Those in attendance at this meeting were:

Martin Buzan, BLM Nevada State Office
 Eric Cronkhite, Nevada State Parks Administrator
 Ralph Dunn, BLM Nevada State Office
 Mrs. Samuel Ford, State Parks Advisory Committee
 Tom Handley, BLM Las Vegas
 Bill Holmes, BLM Nevada State Office
 Frank Pallo, BLM Portland Service Center
 L. J. Porter, BLM Las Vegas
 Del Price, BLM Denver
 John Richardson, Nevada State Park Planner, Carson City
 Art Tower, BLM Las Vegas.

The Planning Team, Consultants and Advisory Committees were as follows:

Planning Team

Delmar Price (Team Leader)	DSC	Recreation Planning
Lloyd Pierson	DSC	Archaeology & Interpretation
Robert Saunders	DSC	Demand Analysis
Norman Waagen	DSC	Landscape Architect
Frank Pallo	PSC	Resource Management
Keith Chatterton	PSC	Landscape Architect
O. B. Howell	NSO	Landscape Architect
Arthur Tower, Area Mgr		Las Vegas Resource Management
John Richardson		Nevada Landscape Architect State Park

Consultants

Terry W. Savage	National Park Svc	Park Planner
Richard Barbar	Bur. Outdoor Rec.	Demand Analysis
Howard Booth	Sierra Club	Resource Conserv.
Alfred Taggart, Jr.	Clark Co.Plan.Dept.	Regional Planning
Dr. James Deacon	Nev. Sou. Univ.	Ecology
Dr. Chester Longwell	Stanford U.	Geology

K. K. Miller	Interested Citizen	Weather & Resources
Dr. Richard H. Brooks	Desert Res. Inst.	Archaeology
John Donaldson	Nev. F&G Comm.	Wildlife
Ted Snyder	U.S.G.S.	Hydrology
Ralph Smith	U.S.G.S.	Hydrology
Elbert B. Edwards	So. Nev. Historical Society	History
Ralph Conrad	BLM, WO	Resource Management

Advisory Committees

Red Rocks Resource Committee
 State Park Advisory Commission
 BLM District Advisory Board

6. June 27, 1967 - Spring Mountain Planning Unit, of which the Red Rock Recreation Lands are a part, was classified for multiple use management.
7. October 29, 1967 - Red Rock Canyon Recreation Lands were dedicated.
8. December 31, 1967 - Letter from K. K. Miller concerning the draft of the Red Rock Master Plan. Mr. Miller suggested that the plan emphasize research of past Indian use and study the agriculture potentials of Red Springs.
9. January 3, 1968 - Nevada State Parks Advisory Commission Meeting. Those in attendance were: Thomas W. Miller, Robert Forson, Thalia Dondero, Jean Ford, Eric Cronkhite, John Richardson, and Charles Crunden. (Del Price had presented Red Rock Master Plan to the group December 18, 1967.) The following were comments and recommendations made on the Master Plan:
 - a. Ash Creek - Recommend campground be eliminated at this site and Calico Basin development sites be used for organizational or individual day use activities. Jean

Ford suggested that Calico Basin be excluded from Federal or State management consideration and be developed and managed by County. Ash Creek be included in final phase of development.

- b. Roads -
 - (1) Administrative control of the road system be reworked so as to require only two contact stations.
 - (2) Brownstone Canyon Road should be dead-ended at park boundary to allow only interior use.
 - (3) Eliminate from the plan the details regarding the number of parking spaces on Crestline Highway.
 - (4) Use existing roadbeds where feasible.
 - c. Hunting - Should be allowed during established seasons. Firearm use and hunting should be excluded from developed areas and near roads. Use of guns allowed only during hunting seasons. Rifles should not be permitted; deer hunting should be limited to bow and arrows.
 - d. Bicycle Trail - Provide trails adjacent to the major roads. Development should be in final phase.
 - e. Rams Head - Corrals and campgrounds should be developed.
 - f. Interpretive Center - Should be in Phase I of development.
 - g. Campground Site - Provide trailer campground site in lieu of Ash Creek.
10. January 9, 1968 - Meeting with Red Rocks Resource Committee to discuss the Red Rock Recreation Lands Master Plan.

Howard Booth opposed any roads on the Bluff. George Harris felt they were needed. The following recommendations were made:

- a. Calico Basin be developed by a political subdivision other than federal or state.
- b. There be one entrance to the Red Rocks.
- c. The road to Sandstone Quarry Area should terminate there and not be a loop road.
- d. Roads follow existing alignments as nearly as possible. New roads, uncut, be strongly considered before they are developed. Existing scars be handled in the best possible way.
- e. No hunting be allowed in the Red Rocks.
- f. Cattle grazing be kept south of the developed areas.

11. January 17, 1968 - Letter from Howard Booth contained the following comments or recommendations on the Master Plan:

- a. Education should be the prime objective.
- b. Livestock grazing should not be allowed.
- c. No hunting should be allowed.
- d. Remove burros.
- e. Water should be given the following priority:
 - (1) Wildlife
 - (2) Stream vegetation
 - (3) Human consumption
 - (4) Irrigation
 - (5) Flush toilets and showers

(6) Livestock

- f. Mr. Booth feels that roads should use existing alignments, and no new ones constructed. They should be located to offer the best view, yet be unobtrusive.
 - g. The north end of the Bluff should be wilderness; developments here limited to hiking trail construction only.
 - h. Endorsed the proposed land acquisitions.
 - i. Discourage off road vehicle travel.
 - j. Priorities of importance.
 - (1) Education
 - (2) Hiking
 - (3) Picnicking
 - (4) Camping
 - (5) Sightseeing
 - (6) Horseback riding (exclude all motorized vehicles from trails.
12. Written statement by Jean Ford, with the following comments and recommendations:
- a. No hunting be allowed in the Red Rock Canyon Recreation Lands.
 - b. Separate trails be developed for horses.
 - c. A campground with corral as a part of the Rams Head development.
 - d. Calico Basin should be excluded from development plans of BLM and the State. This should possibly be a county project. Trailer parking is not appropriate for Calico Basin.

- e. A loop road should be considered for Brownstone. Everyone should enter and exit through a central entrance. Camping facilities should be considered in this area.
 - f. Interpretive Center should be in Phase I.
 - g. Mrs. Ford questioned the large number of roadside stops on the Crestline Road. Most interpretation should be done in the interpretive center.
13. February 15, 1968 - Meeting with the Nevada State Parks Advisory Commission. The purpose of this meeting was to discuss archaeological investigations and surveys for the Red Rock area. Because of fund limitations of BLM, and Dr. Brooks not having the time, the Advisory Commission was going to request funds to do this work.
14. February 24, 1968 - Nevada State Park Commission letter to Nolan Keil made the following comments:
- a. Emphasis should be on day use.
 - b. Hunting be allowed during established hunting seasons. Areas adjacent to roads and developed areas should be closed to hunting and use of firearms. Hunting be on a trial basis. Deer hunting only with bow and arrows - rifles excluded.
15. Letter to Eric R. Cronkhite, Administrator, Nevada State Parks System dated February 14, 1968 from Las Vegas Sportsman opposing closing of the Red Rock Canyon Recreation Lands to hunting. The letter was signed by Grover Lear.

16. March 29, 1968 - "To Whom It May Concern" letter from Mr. K. K. Miller. Mr. Miller supported BLM's management of the area for the greatest good for all people.
17. March 29, 1968 - Meeting with the Nevada State Park Advisory Commission. They made no recommendation on the Red Rock Canyon Recreation Master Plan, as they had not seen the revisions. Some thought the Red Rocks should be a State Park. If it isn't a State Park, then why spend State funds on purchasing Pine Creek? K. K. Miller and George Harris supported BLM's management and development proposals.
18. April 10, 1968 - Meeting held with the Nevada State Park Advisory Commission. The Master Plan revision was discussed. The opinion of the group was divided. Some supported BLM's proposals as outlined in the plan; some felt the State Park should be more involved.
19. April 11, 1968 - Meeting of the Red Rock Resource Committee held at Mrs. Jean Ford's residence. There was some opposition to full development as outlined in the Master Plan. Some felt the Nevada State Parks should be more involved. The final consensus of the group was to proceed with the Master Plan.
20. Letter from the Nevada State Parks Commission dated August 1, 1968 concerning the Master Plan. They felt the number of recreation facilities needed study. They believe there are too many proposed in Pine Creek.
21. June 4, 1968 - Meeting held in Carson City with Nevada State Park Advisory Commission. The questions and comments

were as follows:

Jean Ford: How can State Parks cooperate.

Nolan Keil said by council, advice and proposals on Master Plan and Interpretive Program.

K. K. Miller: Have you spent any money on Red Rocks? What about the future?

Nolan Keil said we have spent possibly 1/2 million dollars since 1960. He reviewed program for future. The State's \$132,000 was originally for the Visitor Center. He recommended it not be spent there. Suggested purchasing Pine Creek.

Bob Forson - Could Pine Creek be traded for lands in the Valley of Fire?

Jean Ford - Could it be feasible for State to operate Pine Creek in Red Rock Canyon Master Plan?

Pine Creek is included in the plan, and the State could develop and manage it if the State acquired it.

22. August 13, 1968 - Letters of invitation to attend a public hearing on August 29, 1968 were sent to the following agencies, groups, organizations and individuals:

FEDERAL GOVERNMENT

Frank Sylvester
Regional Director
Bureau of Outdoor Recreation
Department of the Interior
180 New Montgomery Street
San Francisco, California

Carl Hauser
Ranger, Toiyabe National Forest
Federal Building
Las Vegas, Nevada

Charles Richey
Superintendent
Lake Mead National Recreation Area
National Park Service
Boulder City, Nevada

Howard W. Cannon
U. S. Senator
310 South 3rd
Las Vegas, Nevada

Stabilization and Conservation
Service, Agricultural
Federal Building, Room 1-634
300 Las Vegas Blvd. South
Las Vegas, Nevada 89101
Mr. James I. Lee, County
Office Manager

Nellis Air Force Base
Las Vegas, Nevada 89110
Brig. Gen. R. G. Taylor, Jr.
Commander of USAF Tactical
Fighter Weapons Center
Col. John F. Anderson, 4520th
Combat Support Group Commander

Geological Survey
Water Resources Division
2765 South Highland Avenue
P. O. Box 14100
Las Vegas, Nevada 89114
Mr. Richard K. Blankennagel,
Research Hydrologist

Edward Maw
Supervisor
Toiyabe National Forest
Reno, Nevada

Baine Cater, Manager
Desert Game Range
Bureau of Sport Fisheries and Wildlife
Decatur at Vegas Drive
Las Vegas, Nevada

Alan Bible
U. S. Senator
2022 E. Charleston Boulevard
Las Vegas, Nevada

Walter S. Baring
Representative

Lloyd Howland
Soil Conservation Service
300 Las Vegas Blvd. South
Room 4-628
Las Vegas, Nevada

Coast and Geodetic Survey
2753 South Highland Avenue
P. O. Box 14100
Las Vegas, Nevada 89114
Mr. Kenneth W. King, Chief of Party

Public Health Service
944 East Harmon Avenue
P. O. Box 15027
Las Vegas, Nevada 89114
Mr. John R. McBride, Acting Director

Mines, Bureau of
500 Date Street
Boulder City, Nevada 89005
Mr. Delwin D. Blue, Chief, Boulder City
Metallurgy Research Laboratory

Regional Office
P. O. Box 427
Boulder City, Nevada 89005
Mr. A. B. West, Regional Director,
Region 3

General Services Administration
Motor Pool Headquarters
Federal Building, Room 1-608
300 Las Vegas Blvd, South
Las Vegas, Nevada 89101
Mr. John L. Welsh, Manager

Atomic Energy Commission
Nevada Operations Office
2753 South Highland Avenue
P. O. Box 14100
Las Vegas, Nevada 89114
Mr. James E. Reeves, Manager

Farmers Home Administration
Federal Building, Room 1-632
300 Las Vegas Blvd, South
Las Vegas, Nevada 89101
Mr. Sherwin Heaton, County Supervisor

STATE GOVERNMENT

Paul Laxalt GOVERNOR State Capitol Building Carson City, Nevada

Elmo DeRicco, Director
Department of Conservation
and Natural Resources
State Capitol Building
Carson City, Nevada

Eric Cronkhite
Division of Parks, Administrator
Fall and King Street
Carson City, Nevada

Mr. Francis Thorne
Division of Water
Resources Engineer
215 E. Bonanza
Las Vegas, Nevada

Jack Parvin
State Highway Department
1200 North Main
Las Vegas, Nevada

Mr. D. F. Zoller
Nevada Department of Agriculture
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Las Vegas, Nevada

Charles Crunden
Fish and Game Commission
215 E. Bonanza
Las Vegas, Nevada

John Donaldson
Nevada Fish and Game Commission
4447 Vegas Drive
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Wayne Kirch
Chairman, Nevada Fish & Game Commission
4447 Vegas Drive
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Pat Head
Colorado River Commission
302 East Carson
Las Vegas, Nevada 89101

STATE PARK ADVISORY COMMISSION
Clark County Court House
200 E. Carson Avenue
Las Vegas, Nevada

COUNTY COMMISSIONERS

James G. Ryan, Chairman
William H. Briare
Darwin Lamb

Col. Thomas W. Miller, Chairman
State Capitol
Carson City, Nevada

Mrs. Jean Ford
3511 Pueblo Way
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William Belknap
650 Arizona
Boulder City, Nevada

Lou F. LaPorta
Robert T. Baskin

Robert O. Forson, Vice Chairman
2729 Webb Street
North Las Vegas, Nevada
Director of Parks and Recreation

Mrs. Thalia Dondero
808 Bonita Avenue
Las Vegas, Nevada

APPOINTED

Ralph Lamb
David B. Henry

Alfred J. Taggard, Jr.
Elmer Anderson
George Monahan

County Sheriff
County Administrator

Planning Director
Recreation Director
County Engineer

RED ROCK RESOURCE COMMITTEE
Appointed by State Park Advisory Commission

Cliff Segerblom
Artist-Designer-Conservationist
620 Avenue H
Boulder City, Nevada

Margo Bartlett
Journalist-Conservationist
1346 Desert Inn Road
Las Vegas, Nevada

Dr. James Deacon
Professor Biology
Nevada Southern University
Las Vegas, Nevada

Mary Kozlowski, President
Archaeo-Nevada Society
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R. K. Miller
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Las Vegas, Nevada 89101

CITY OF LAS VEGAS
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400 Stewart Ave.

Oran Gragson, Mayor

Art Trelease, City
Don Saylor, Planning Director
Donald Payne, Director of Parks and Recreation

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Edgar Fountain
Phillip Mirabelli
Grant Stewart
Art Trelease

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Don Saylor
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Las Vegas, Nevada

Director of Planning
Dick Sauer
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Las Vegas, Nevada

Mr. Keith MacDonald
Recreation Department
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Clay Lynch, City Manager
1301 E. College Avenue
North Las Vegas, Nevada

CITY OF HENDERSON
City Hall
243 Water Street, Henderson

William R. Hampton, Mayor

Alex J. Callahan
Director of Parks and Recreation

Mr. George W. Charchalis
City Manager
Henderson, Nevada

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631 Don Vincente Drive
Boulder City, Nevada

Kenneth Andree, Recreation Coord.
213 Avenue I
Boulder City, Nevada

Fred Pendleton, Chairman of Rec. Board
609 New Mexico
Boulder City, Nevada

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Program Director
Boys Clubs of Clark County, Inc.
Corner of Carey & Webster
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Camp Fire Girls, inc
3151 Industrial Road
Las Vegas, Nevada

Miss Gayle Kitchell
Executive Director
Camp Fire Girls, Inc.
3151 Industrial Road
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Emery Conaway
Chairman, Advisory Board
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Casino Center Blvd. & Bonanza Road
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2309 Marony Avenue
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Verl Lee
President, Boulder Dam Area Council
1135 E. University Road
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Hughes Tool Co.
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Mr. G. Rhodine
Hughes Tool Co.
P. O. Box 309
Las Vegas, Nevada 89101

CLARK COUNTY

County Engineer
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Clark County Engineering Department
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Las Vegas, Nevada

Mr. Murray Hoyt
Clark County Planning Director
200 East Carson Avenue
Las Vegas, Nevada

Mr. Elmer H. Anderson
Clark County Parks and Recreation
Dulla Recreation Center
Bonanza Center
Bonanza Street
Las Vegas, Nevada

David Henry
Clark County Administrator
200 East Carson Avenue
Las Vegas, Nevada

23. August 29, 1968 - Public Meeting. The Master Plan was presented by BLM personnel, and the following comments were received:
- Margo Pesek, State Highway Department and Review Journal columnist, objected to the ranch style design of the visitor center and other buildings. The type of building considered for the visitor and interpretive center would be a mistake, and not fit the area. Materials planned for use would fit and blend well with the landscape.
- Charles Crunden, Nevada Fish and Game Commission, said the commission was opposed to any arbitrary closing of hunting or fishing privileges on recreation lands.
- Verlis Fisher, Nevada Outdoor Recreation Association, (authorized representative), turned in a written statement supporting the submitted Master Plan and commending the Bureau of Land Management.
- Marvin Pistrang, a Sierra Club member, submitted a written brief outlining their comments on the Master Plan.
- Margo Pesek, asked if water would be piped into recreation facilities rather than using wells. She asked if Springs Seep, etc. in the area could be developed. She indicated concern that such development of groundwaters might take natural water from wildlife and vegetation in the area.
- Mrs. Robert Bartlett, representing the Garden Clubs of Nevada asked if it was possible to protect wildlife and limit

hunting on the Spring Mountain Range. She thinks that mountain sheep are becoming quite rare and feels a lottery might be established for drawings on hunting the sheep.

George Harris, Red Rock Resource Committee member, commended the Bureau and expressed a favorable opinion of the plan in general.

Pierre Namay, local resident, stated that Indian pictographs are being painted over by teenagers.

Thalia Dondero, Girl Scout Executive Committee member, asked whether it would be possible to fence areas within Calico Basin. She was concerned over jeeps, motorcycles, etc. passing over Girl Scout deeded land.

Mrs. John T. Cole, a local resident, felt that Red Springs needed development. It is receiving heavy use (over 300 on July 4) and has no restroom or other facilities available. She suggested a traffic counter be placed on this road.

Mrs. Mary Gardner, a Red Rock area resident, mentioned that Red Springs was supposed to be a day use facility but people with campers and trailers were camping there for two weeks at a time. She stated the rocks were being badly defaced.

Howard Booth, Red Rock Resources Committee, also a member of the Sierra Club, commented from his written statement. They were pleased with the general work that BLM and the State of Nevada had done. However, he did question some of the details of the plan and was concerned that development does not exceed capabilities of resources themselves.

He hoped the area would give people a place to associate

with nature, not necessarily any place to provide recreation. He was not particularly concerned with providing people with campsites, sightseeing, driving areas and did not wish to see areas just for hiking, camping or driving just for pleasure; rather, to leave the area so each person could interpret it for himself. He indicated that development based on demand should be toned down, and the possibilities of limiting numbers of visitors. He felt that picnic areas should be downgraded since they would possibly receive heavy use around water development areas; also there should be no visitor use of water sites.

Mr. Booth felt the most sensitive area of the Master Plan is the roads portion, and that the present road system is adequate. He questioned the feasibility of planting on road scars. He felt the Willow Springs Road should be maintained instead of building the proposed Segment B, and that the existing roads give good views in both directions. He was displeased that the planned loop road would be visible.

Mr. Booth said the Crest Road parallels an existing trail already on top, and there should be provisions for the driving public to be able to see the views from the top of the overlooks. The loop road should only be brought to an overlook just west of Mt. Wilson, then if strong demands exist for its continuation, it should be brought back around over the western approach. This should leave four or five miles of unbroken wilderness across the crest of the area. He stated they did not like to see hunting in a congested area.

With the development of roads and other developments, he feels an already limited species will decrease further. He thought they (bighorn sheep) will become an endangered species and hunting should be limited further. He hoped with stages of development, adequate funds would be available to maintain and police the area.

Mr. Booth then concluded with the thought that we need more bad roads to discourage the slightly interested visitor and keep out the good roads which would bring in more people. Mrs. Bartlett, of the Garden Clubs, felt that we should keep in mind the aesthetic values of the area. She felt the "Spoke" roads rather than "round" roads are adequate, and dead-end roads be retained. She felt a road on top would deface the area and defeat our purpose.

Marvin Pistrang, Sierra Club, said he thought the area should be retained as a wilderness and as a natural area rather than being developed for a number of people. He thought the existing roads could be developed to do the job required in the Master Plan.

Mrs. Bartlett stated it should be kept as a unique spot, rather than making it a public campground.

Mr. Rolf Peterson, Outing Chairman of the Sierra Club, felt that development of the area based on projected use is not sound. He felt that the development could be done by the Bureau in such a way as to not destroy the aesthetics of the area itself.

Mr. Robinson, a local citizen, complimented the Bureau on

the fine job it is doing, and felt that the area should be developed for the most people and not restricted to a special use or interest group.

Bob Forson, Chairman of the Regional Park Service Committee, stated Nevada Parks is planning several regional parks in Las Vegas Valley, and felt that overnight and day use of the Red Rock area was being included in the overall plan of the Park System.

Mr. George Harris, a consultant for Clark County Schools, mentioned the Multiple Use Act and asked whether or not the classification of the Red Rocks area as a recreation area was in the best interest of most people. He felt that professional BLM people will manage the area for the most good of the most people, and he is for it.

Margo Pesek said her group had come to the conclusion that it could become a recreation and a natural area with proper administration. She reiterated her feeling that developing camp and picnic grounds at existing waters will be detrimental to both wildlife and natural vegetation.

Del Price, BLM Recreation Specialist, Denver Service Center, said the Master Plan has given priority to preserving all surface and natural water areas. Pine Creek would be the only location where there may be a conflict. The north fork of Pine Creek will be closed off and prohibited to any type of recreational use and that development would be far

enough from water that there would be little conflict of resources.

Mrs. Pesek was not aware of this, and said that she felt people could hike into an area, but should not use the area for its shade, etc. If we were not going to utilize the waters, why do the developments have to be anywhere near them in the first place? Mr. Price stated the areas chosen are the best available as far as recreation potential is concerned.

Mrs. Bartlett stated when people are attracted there, litter and related problems also arise. She felt it should be reserved for future generations.

Mr. Keil explained that camping areas would require adequate protection facilities.

Mrs. Bartlett stated if campgrounds were close to petroglyphs they would be handy to deface; but, if they were farther away, they could be enjoyed and not defaced.

Mr. Jesse Palm, Forester for U. S. Forest Service, thanked BLM for attempting to provide adequate accessibility to the Red Rock Canyon Recreation Lands to serve a large number of people.

24. Summary and Comments on written statements received regarding the Master Plan for the Red Rock Canyon Recreation Lands.

a. Nevada State Park System - Eric Cronkhite, Administrator

(1) Against camping or picnic areas being developed in

wild or wilderness area.

COMMENT: None planned in areas classified as wild areas.

- (2) Believes the water in the State of Nevada is owned by the State, and should be appropriated through the State Engineer's Office.

COMMENT: No argument there. The question on page 5F is a poor choice of words, and could be reworded.

- (3) Questions the reliability of the number of recreation facilities proposed at various sites, especially Pine Creek.

COMMENT: Maximum capacity is generally indicated in Master Plan. Actual development will be preceded by detailed study and determined by demand, site capabilities and appropriations. Developments in Pine Creek dependent upon acquisition of private land in Pine Creek.

b. Mrs. Jean Ford, Member of State Advisory Commission

- (1) What are the "optimum number of recreation facilities compatible with capacity of resource."

COMMENT: Generally indicated in Master Plan, but this will have to be determined in detail at each site.

- (2) Suggests annual review and updating.

COMMENT: Fully agree that periodic review and updating will be necessary. Plan should so provide.

- (3) Recommends no hunting on valley floor, no rifles in area, and deer hunting by bow and arrow only.

COMMENT: This is a multiple use area open to controlled hunting. Fish and game sportsmen will insist on hunting in the area. We may be able to get a county ordinance to restrict shooting within 500 ft. of any road which would alleviate most of the problem. Would have problems enforcing restrictions on certain types of firearms.

- (4) Wants trailer camping somewhere in the area.

COMMENT: Some trailer accommodations could be provided at Sandstone Quarry and Rams Head.

- (5) Suggests picnic facilities near interpretive center and parking for buses.

COMMENT: Good suggestions.

- (6) Opposed to abandoning existing roads for new roads.

COMMENT: We can delay for further study on some plans of abandonment without affecting plan seriously. (Recommendation in summary).

- (7) Suggests eliminating Crestline Scenic Drive from Summit to Rams Head.

COMMENT: Construction of this can be delayed until the need and location of this segment is more definitely known.

- (8) Include nature study as listed activity in the plan.

COMMENT: No problem; could be included. Lost Creek

should have a nature trail to falls.

c. Sierra Club - Marvin Pistrang

- (1) Reduce scars; abandon Segment "B" and utilize existing Willows Spring Road and Pine Creek Road.

COMMENT: This course of action is recommended for immediate future until accurate location and stronger public support indicated.

- (2) Recommend completing Mt. Springs - Rams Head Road to overlook west of Mt. Wilson, then drop down canyon west to Lowell Canyon Road and abandon Crestline from Rams Head to Red Rock Summit. This to allow wilderness trails.

COMMENT: This suggestion is worthy of consideration as an alternate until better data and support are available. (See summary recommendations.)

- (3) Recommend abandoning plan for new road from Red Rock Summit to LaMadre Spring and utilize existing road.

COMMENT: We should not abandon - just delay until better data and support are available.

- (4) Recommend play down overnight use around Pine Creek.
- &
- (5) Develop fewer picnic sites and study impact on the area.

COMMENT: This will be done around Pine Creek. Foreseeable future as acquisition of private land questionable. Impact studies will be needed as initial developments

are made.

- (6) Permit no cutting of firewood or removal of vegetation.

COMMENT: Full agreement - that this is intent of plan and should be spelled out stronger.

- (7) Recommend no development to encourage increased visitor usage before adequate protection personnel available.

COMMENT: Agreed - added personnel should precede facility development.

d. Sierra Club - Howard Booth

- (1) Reduce road scars (same as Pistrang recommendation)
- (2) Same as Pistrang recommendation
- (3) Same as Pistrang recommendation
- (4) Suggests portions of loop roads be one-way roads

COMMENT: Has some validity for further study. I feel one-way roads must be very short loop roads spurring from main drives only.

e. K. K. Miller - Commenting on Visitor Center

- (1) Feels there should be more display area in Visitor Center.
- (2) Opposes flat roof (mesa type) structure as designed for Visitor Center. Contends that the architecture does not relate to surroundings.

COMMENT: He has a point worthy of further study.

(3) Opposes wash boulders as facing for part of the Visitor Center. Recommends native ledge stone.

COMMENT: There is an abundance of both stone and the choice should be made only after careful study.

(4) Recommends Visitor Center site be an imposing overlook with sighting devices to points of interest.

COMMENT: I believe the Visitor Center site is an imposing overlook and it does provide for sighting devices. K.K. may not be familiar with the actual site selected.

(5) Recommends roughly comfortable study facilities instead of expensive buildings with gardens.

COMMENT: Planned center would be roughly comfortable and will have some provisions for study and garden meditation. Congratulations on the general Master Plan.

f. Nevada Outdoor Recreation Association - Verlis Fisher

Considers it a day use public recreation area. Considers the Master Plan will achieve goal of public use and enjoyment and provide means of better protection. NORA endorses the Master Plan and compliments BLM and NSP.

g. Nevada Wildlife Federation

Endorses the Master Plan; commends BLM and State Park for it, and deplores any attempt by special interests to prevent full public enjoyment of the area's many attractions.

ROSTER OF ATTENDANCE AT RED ROCK CANYON
RECREATION LANDS AND PUBLIC SALE APPLICATION MEETING
August 29, 1968

Elmer H. Anderson
Director of Parks and Recreation, Clark County
4478 Springdale
Las Vegas, Nevada

Mrs. Robert Bartlett
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Larry A. Bolling
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Newsletter Editor, Sierra Club, Las Vegas Group
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Sheilage Brooks
Associate Professor of Anthropology, NSU & Nevada Archaeological Survey
DRI/NSU Museum
Las Vegas, Nevada

Joe Cole
Calico Basin
Calico Basin, Nevada

Mrs. Joe Cole
Calico Basin
Calico Basin, Nevada

Emery Conaway
District Advisory Board, BLM
Callente, Nevada

Norma Cox
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Vivian L. Fischer
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Vice Chairman, State Park System Adv. Board, State Park Systems
City of North Las Vegas
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Tim Hafen
Assemblyman
Pahrump, Nevada

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Coordinator, Nevada Department of Agriculture
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25. Resolution No. 6 - Passed by the Nevada Wildlife Federation, Inc., at their annual meeting of May 15, 1971, at Tonopah, Nevada:

RED ROCK RECREATION LANDS

In October, 1967 the Red Rock Recreation Lands were dedicated to public recreational use and enjoyment. Numerous studies over a period of years had conclusively shown that this was the highest and best use of this very scenic area of the Spring Mts., lying only a few miles west of the fastest growing metropolitan area in Nevada. It was agreed that this area, so close to a large population center, could not escape the pressures and needs of people for outdoor recreation, and a Master Plan for its future development was carefully created by the recreation planners of the BLM, in cooperation with the Nevada State Parks Department and the Federal Bureau of Outdoor Recreation. Even the boundaries of the Desert National Wildlife Range were adjusted accordingly, with all public land lying south of Highway 95 being eliminated from the refuge and being made a part of the Red Rock Recreation complex in recognition of the inevitable.

The Nevada Wildlife Federation is on record as approving these changes, and the development for public use as outlined in the Recreation Master Plan. It is one that offers the general public a deserved opportunity for

scenic appreciation and development of facilities for outdoor recreational enjoyment in an attractive setting through a well-balanced recreational plan which preserves a generous amount of "back-country" for the hiker and climber.

At the present time, an organized effort is being made by a small but active group of hiking enthusiasts to scuttle large portions of the development plans for use by the general public. While recognizing, verbally at least, that the area does not qualify as wilderness, this group nonetheless wants no public encroachment on what has been their private domain. If successful, this effort will result in a serious short changing of the public, which despite being confined to the fringes and suffering a conspicuous lack of facilities, visited the area to the tune of 800,000 last year. This will also result in a continuation of the appalling vandalism which occurs in the area, because adequate protection measures and ranger staff cannot be funded at this low level of development.

While the Nevada Wildlife Federation recognizes that this area is primarily suited for day use, we do not believe that plans for overnight camping developments should be eliminated from the Master Plan at this stage because of the possibility of a significant demand for summer camping at these higher elevations as a relief from the heat of the desert floor. We suggest collaboration with the Lake Mead National

Recreation Area and the Toiyabe National Forest before altering long range plans.

THEREFORE, BE IT RESOLVED, that the Nevada Wildlife Federation, at its 20th Annual Meeting in Tonopah, May 15 - 16, 1971, hereby reiterates its support of the Bureau of Land Management's Master Plan for the recreational development of the Red Rock Recreation Lands, urges adequate funding and prompt implementation on a schedule that will keep abreast of the needs. In the event that special interest pressure groups succeed in sabotaging the recreational development plans, the Nevada Wildlife Federation further resolves that the area either be turned over to the Nevada State Parks Department or that the land be restored to the Desert National Wildlife Range.

26. April 1971 - Recommendations of the Desert Enjoyment

Fraternity:

- a. A sizable work force, hired to maintain and supervise the area now;
- b. The Interpretive Center should be completed as soon as possible;
- c. Except for the existing gravel road into Pine Creek and the newly-graded road south of Oak Creek, all access roads should be returned to nature;
- d. The proposed lodge should be turned into a nature study center for the Clark County School System;

- e. The Red Rock scenic Drive should be designed to follow existing jeep roads as much as possible, with the section from Rocky Gap back to the Blue Diamond Loop Road designed to use the existing Red Rock Canyon Road;
- f. No overnight camping should be allowed in the area except for primitive sites on the trails;
- g. Aside from Red Rock Scenic Drive, no paved roads should be allowed in the general area. Control of existing gravel roads is to be maintained;
- h. No water wells should be drilled in the area except for necessary modification(s) to those wells already present.

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