Bellemont Area Plan

An Amendment to the Coconino County Comprehensive Plan

Development by the Residents of the Bellemont Community with assistance of the County Community Development Department

Approved by the Coconino County Board of Supervisors on July 1, 1985

Bellemont Area Plan

Approved by the Coconino County Planning & Zoning Commission
May 28, 1985

Approved by the Coconino County Board of Supervisors
July 1, 1985

Coconino County Board of Supervisors
Karan L. English, Chairman, District Four
Verne Seidel, District One
Tio Tachias, District Two
J. Dennis Wells, District Three
Louise Yellowman, District Four

Planning and Zoning Commission
Walter Rhoton, Chairman
Jerry Craig, Vice Chairman
Sara Aleman
Dan Cothran
Roy Dan
Bill Helmcke
Tulley Mann
Gordon McHood
Pat Wamble
Jean Wilder

Director of Community Development
Brian N. Hawley

Contributing Staff
John O'Brien - Planner in Charge
Tom Schafer - Technical Assistance
Mike Raber - images
Nina Montfort – Typist

Table of Contents

NOTE: Maps and figures are not included with this electronic copy. Map copies may be obtained from the Coconino County Community Development Department.

Introduction – Purpose and Area Description

The purpose of the Bellemont Study is to determine appropriate land uses and zoning for the Bellemont Interchange area of Interstate 40. Irregular parcel configurations and their close proximity to the freeway and the nearby Santa Fe Railroad tracks detract from the area's appeal for intensive residential development. These same attributes, however, enhance the area's viability for limited commercial and light industrial uses.

Figure 1 identifies the location of the Study Area, the boundaries of which extend about one and one-half miles east and west of the Bellemont Interchange. The Atcheson, Topeka, and Santa Fe Railroad tracks demarcate the Study Area's southern border with the remainder of the private land holdings bordered by the Coconino National Forest. The Study Area includes an additional non-contiguous parcel to the northwest as also indicated in Figure 1. The property was incorporated in the project because of its large size and relative proximity to the Interchange.

Staff's evaluation of the Study Area's Development potential was based upon analyses of a variety of identifiable land use determinants. The following sections of this study provide a comprehensive review of factors which have historically influenced the area's development and which remain valid in the consideration of future uses.

Historical Development

Permanent settlement of the Bellemont area was first initiated in 1876 with the construction of a 12-room ranch house by a Texas rancher named Walter Hill. Hill, who had previously herded cattle along the Chisholm Trail settled in the area with the intention of establishing a ranching operation for sheep. The availability of a reliable water source, now known as Volunteer Spring, appears to have influenced Hill's selection of the area for the establishment of his ranch. The spring also attracted the attention of the Northern Arizona Stagecoach Company, who subsequently established a relay station in the general vicinity of the spring to support their stagecoach lines through the area.

Development of the railroad in 1882 provided the next major impetus for the area's growth. The large number of railroad ties necessary for extension of rail service mandated the establishment of lumbering operations in the area, which continued to operate for many years thereafter because of the convenience and inexpensive transportation the railroad provided for milled lumber.

The community that developed in the area was commonly referred to as Volunteer until 1882, when the name of Bellemont was officially designated. Bellemont never was a large settlement. Permanent residency in the area appears to have been fairly stable but grew to no more than 400 people in that 50 year span from the introduction of the railroad to the early 1930's. Limited resources and the growing appeal of Williams to the west and Flagstaff to the east affected Bellemont's viability as a community. By the time the Navajo Army Depot was established in the area in 1942, the Bellemont community had already rapidly declined. The town was almost completely deserted when the Interstate 40 bypass was constructed in 1963. There are now only three occupied dwellings at the original Bellemont Townsite.

Ownership Patterns and Current Zoning

The Study Area encompasses approximately 594 acres of private land with ownership patterns more specifically indicated in Appendix 1. The majority of the land is now situated in the G (General) Zone allowing for limited agricultural and very low density residential uses (one dwelling per ten acres). Approximately 52 acres within the study area are zoned CH-10,000 (Commercial-Heavy). Figure 1 illustrates the current zoning pattern.

Existing Land Uses

Figure 2 illustrates current development patterns within the Study Area. The Bellemont Truck Stop, situated just north of the Interchange, is the area's largest existing development. Approximately 10.8 acres are incorporated within the development which was originally authorized by Coconino County in 1967. Existing facilities include a 4700 square foot building accommodating a restaurant, service station and gift shop. Fuel dispensing facilities and a truck maintenance bay are provided on the site. Two mobile homes for employee housing are also situated on the property. Remaining land areas are utilized for overnight truck parking. The Coconino County Planning and Zoning Commission approved a 30% expansion of the truck stop facilities in September 1984.

Another improvement located north of Interstate 40 in the most easterly portion of the Study Area is the Haven of Rest Mobile Home/Travel Trailer Park established in 1971. Ten mobile units are currently established in the park for residential purposes. This is the maximum number of units that can be legally accommodated on the site give the park's existing effluent disposal facilities. Remaining parcels on the northerly side of Interstate 40 are vacant.

Improvements located on the southerly side of Interstate 40 include the original Bellemont Townsite situated adjacent to Old Route 66 South (See Figure 1). Most of the dwellings within the townsite were abandoned several years ago and are now in a state of extreme disrepair. Of the three currently occupied buildings on the site, two are now used for single family residential purposes with the remaining one now utilized as a combination liquor store/apartment. One of the single family dwellings was constructed in 1920 and the owner has applied for nomination to the State Historical Register.

An El Paso Natural Gas substation is located easterly of the Bellemont Townsite directly adjacent to a commercially zoned property which as approved by Coconino County in 1983 for a multifaceted commercial development. To date, however, only one structure incorporated into the approved plan has been partially constructed and is proposed for use as a motorcycle sales/service facility.

Further east along Old Route 66 South are approximately eight dilapidated buildings, now abandoned, but previously used as a Whiting Brothers service station and associated motel units. Use of these facilities may have been terminated when the Interstate 40 bypass was constructed and Old Route 66 was abandoned as the mojor east-west thoroughfare.

Located in the extreme southeast corner of the Study Area is a motel development formerly known as the Pine Breeze Inn. This development likewise appears to have lost its financial viability when Old Route 66 was bypassed by the Interstate, as use of the facility for motel purposes seems to have been discontinued. Current utilization of the property consists of limited residential use of several of the former motel units and a couple of mobile units which have been established on the site. Remaining parcels on the southerly side of Interstate 40 are vacant.

Surrounding land uses include the Navajo Army Depot to the south and Coconino National Forest in all other directions.

Land Use Determinants

Future development of the Bellemont area is contingent upon recognition of a variety of pertinent constraints. The following sections of this study address these factors.

A. Topography and Vegetation

The entire Study Area is comprised of generally flat lands with slopes averaging approximately 5%. Mature woodland vegetation on the site is extremely limited and is confined to those areas as shown in Figure 1.

B. Soils

The Soil Conservation Service of the United States Department of Agriculture provides detailed information regarding the inherent qualities and engineering limitations of soils. A soil survey of the Bellemont Study Area was conducted in October, 1984. The survey is general in nature but provides valuable insight into development-related problem areas that need to be considered for land use planning purposes.

The report of the Soil Conservation Service is included with this study as Appendix B. Figure 3 illustrates dominant soil types within the Study Area. In general, soils in the vicinity of the Bellemont Interchange have a high shrink-swell potential, which is to say they tend to contract when dry and expand when wet. Soils of this type typically present a greater potential for structural damage to buildings and other improvements developed on them. Area soils also have a slow to very slow permeability rate, meaning that water is not readily transmitted through the soils when saturated. Soils with slow permeability typically allow for infiltration of water at a rate of no more than 0.2 inches per hour, causing surface waters to pond for prolonged periods, creating difficulties with the proper operation of standard septic tank systems, and generally increasing flooding hazards in the areas of their occurrence. Soils in the Study Area are generally shallow, providing no more than 20 to 40 inches of soil cover over the underlying bedrock and creating difficulties for establishment of proper foundations and underground utilities.

C. Effluent Disposal

All of the previously indicated problems associated with the soils in the Study Area adversely affect the installation and proper functioning of septic tank absorption fields. Because of these problems, the Soil Conservation Service identifies the soils of the Stud Area as being severely limited for that type of use. Severe soil limitation indicate conditions which are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. The high clay content and shallow depths of area soils create problems with adequate percolation and soil saturation (ponding and flooding) that effectively prevent standard septic systems from operating properly. Shallow depth to rock and the presence of large stones throughout the area also make installation problematic.

Two developments within the Study Area have experienced previous problems regarding their effluent disposal systems. The Haven of Rest Mobile Home/Travel Trailer Park was originally approved for approximately 80 trailer hookups. However, the Park is currently limited to a maximum of ten units because of functional limitations of their standard community septic system.

The Bellemont Truck Stop has also experienced difficulties. This development utilizes sewage lagoons to accommodate effluent disposal. Unfortunately, the lagoons were originally installed at a higher elevation than an on-site water well serving the truck stop, leading to contamination of the well as a result of a spring flood and the subsequent issuance of a Cease and Desist Order for the well from the State Health Department in May, 1982.

Because of the problems associated with the use of standard septic systems in this area, installation and use of alternate effluent disposal systems such as package treatment plants, evapotranspiration systems, or other alternatives acceptable to the State Health Department may be required.

D. Flood Hazards

Figure 4 illustrates areas of special flood hazards, periodic ponding, and high water table occurrences within the Study Area. Approximately twenty-five acres of land are situated within the one hundred year floodplain of Volunteer Wash. A good portion of the Study Area is subject to periodic ponding. High water tables affect approximately three-fourths of the noncontiguous parcel included in the Study Area and located to the northwest of the Interchange.

Flood hazards associated with the Study Area create higher potentials for structural and personal property damage and increased insurance costs for proposed developments. Accordingly, all new developments in identified flood hazard areas (as shown in Figure 4) will be allowed only in accordance with all applicable County, State and Federal flood management regulations.

E. Water Supply

The Arizona Department of Health Services' Bureau of Water Quality Control regulates public water distribution systems in Arizona. Their records indicate that groundwater resources in the Bellemont area are readily available but limited to low volume production due to a shallow aquifer. There are currently two water distribution systems within the Study Area.

The first of these is situated on the Bellemont Truck Stop property. This well was established in the autumn of 1983 and is classified as a non-community public water system serving about 200 people. The system provides water for the truck stop restaurant, service station, public showers, and two employee mobile homes. The well is 200 feet deep with an output of 14 gallons per minute. A 3,000 gallon storage tank is also included in the system.

The other water system within the Study Area is owned by the Santa Fe Railroad and is leased by Bellemont Industries. The facilities,

consisting of two wells and a large storage tank have been operated by Bellemont Industries since 1962. The water system is located just south of the Bellemont Townsite on Santa Fe Railroad right-of-way.

These facilities are classified as a non-community water source serving about 500 people via water haulers and several service connections. The two wells are approximately 150 to 200 feet in depth. The storage tank has a capacity of 203,000 gallons, approximately 98.5% of which is utilized by residents of the Parks area who haul water for domestic purposes. The remaining 1.5% of the water available from this system serves the three currently occupied residences at the Bellemont Townsite. The total water usage varies from 35,000 gallons per day during the winter to more than 100,000 gallons perday during the peak summer months.

The water system serving the Navajo Army Depot which is situated outside of the Study Area consists of three springs, three small reservoirs and one well, all of which are located on the Depot's property.

F. Utilities

Utility companies which serve the Study Area include El Paso Natural Gas, Southern Union Gas, Arizona Public Service and Mountain Bell.

The El Paso Natural Gas substation is located just southeast of the Bellemont Interchange. The company does not provide individualized service in the area, but does supply Southern Union Gas which in turn serves individual property owners.

Southern Union Gas currently provides service for the Navajo Army Depot, Bellemont Truck Stop and all other properties on the eastern side of the Bellemont Interchange. The company provides no service on the western side of the Interchange. All gas lines within the Study Area have a two inch diameter and may have to be enlarged to four inches to accommodate additional commercial or industrial uses.

Arizona Public Service currently serves the entire Study Area and the Navajo Army depot for electrical needs. Electrical service may be required to be upgraded if additional commercial or industrial uses are located in the Study Area.

Mountain Bell provides the telephone service for the entire Study Area. Depending on the need of the development, Mountain Bell will install the necessary wire capacity for new development.

G. Roads

Interstate 40, which was constructed in the early 1960's, bisects the Study Area into northern and southern sections. Prior to the Interstate 40 bypass of Bellemont in 1963, the major thoroughfare in the area was Old Route 66 South which runs parallel to and south of the Interstate and north of the Santa Fe Railroad. This road provides access to properties south of Interstate 40 and is paved throughout the Bellemont area, but changes to dirt to the west and terminates just east of the Study Area.

Transwestern Road, also known as Old Route 66 North, runs parallel to and north of the Interstate just south of the Bellemont Truck Stop. This road provides access to properties north of Interstate 40 and is paved from the truck stop westward, but is dirt from that point eastward. Transwestern Road turns into Forest Service Road 146 just west of the Study Area.

Old Route 66 South and Transwestern Road are currently designated as being within the Coconino County road system after having been recently abandoned to the County from the State. Both roads, especially Old Route 66 South are in severe disrepair and will have to be improved to County standards if major developments occur in the future.

Land Use and Policy Recommendations

Figure 5 identifies proposed land use classifications for the Bellemont Study Area. These classifications recognize the limitations of properties to support significant residential development, the suitability of the area for industrial/commercial uses and the developmental constraints identified in the report.

It is recommended that the Bellemont Study Area be rezoned to the PC (Planned Community) Zone and that development of all properties be subject to the following developmental standards and policies:

A. Development Standards

1. Residential Uses - Uses permitted within these identified areas and development and performance standards applied thereto shall conform to Section 10 of the Coconino County Zoning Ordinance for the RM-10/A (Residential Multiple Family) Zone, maximum density of 10 units per acre.

2. Mobilehome Park Uses - Uses permitted within these identified areas and development standards applied thereto shall conform to Section 13.1 of the Coconino County Zoning Ordinance for the MHP (Mobilehome Park) Zone.

3. Commercial Uses - Uses permitted within these identified areas and development and performance standards applied thereto shall conform to Section 11 of the Coconino County Zoning Ordinance for the CH-10,000 (Commercial-Heavy) Zone; except that, billboards shall not be permitted.

4. Industrial Uses - Uses permitted within these identified areas and development and performance standards applied thereto shall conform to Section 12 of the Coconino County Zoning Ordinance for the M-1-10,000 (Light Industrial Zone.

5. Signs - The number, type, location and size of all signs proposed for any project shall conform to all requirements and provisions of Section 16 of the Coconino County Zoning Ordinance for the use proposed. Billboards shall not be permitted.

6. Parking - Off-street parking shall be provided for each use in accordance with and subject to the standards of Section 15 of the Coconino County Zoning Ordinance regarding parking.

7. Outside lighting associated with all development within the Study Area shall be of high pressure or low pressure sodium vapor typed and shall not project above the horizontal plane of the light source. Outside lighting shall be shielded so that the direct illumination is confined to the property boundaries of the light source.

8. A comprehensive landscaping plan shall be prepared and incorporated into the overall development plan for all major projects. This landscaping plan shall be submitted to the Director of Community Development for review and approval. All required landscaping shall be installed prior to the issuance of a certificate of occupancy and initiation of use of the facilities.

B. Policies

1. All current health, sewage and water quality regulations shall be rigorously enforced.

2. A comprehensive hydrology study must be conducted and the availability of an adequate water supply must be substantiated to the Arizona Department of Water Resources prior to the initiation of construction of water intensive development projects. The study must clearly show that existing users of the proposed water

source will not be adversely affected by the proposed development. A copy of the study and the State's findings must be submitted prior to approval of the project by the Planning and Zoning Commission.

3. The conservation of water resources shall be a major consideration in all new building construction and shall be enhanced through such programs as the installation of water saving plumbing fixtures and separate water meters for individual units in all new construction within the Bellemont Study Area.

4. A surface hydrology and drainage study and construction plans for facilities necessary to accommodate adequate drainage surface and storm waters must be submitted to the County Engineer for his review and approval prior to the initiation of construction of major development projects. All new development in areas subject to flooding or ponding must be constructed in full compliance with the Coconino County's Floodplain Management Zone requirements.

5. Soil capabilities and limitations shall be recognized and appropriately considered in the County's developmental review and implementation functions as they related to properties within the Study Area. In accordance with this policy, the following procedural sub-policies shall be initiated:

A. Comprehensive on-site soil investigations, conducted by a registered/licensed soils engineer, shall be required for all industrial, commercial, or major residential developments.

B. In areas not served by an approved community effluent disposal and treatment system, the suitability of local soils for the establishment of septic tank absorption fields shall be assessed and all necessary corrective measures shall be incorporated in the proposed disposal system to ensure against soil related system failures.

C. In developments requiring an Excavation and Grading Permit from the County Engineer, the capabilities and limitations of on-site soils shall be appropriately addressed prior to the initiation of construction.

D. Erosion and sediment control measures shall be incorporated in all new construction projects.

E. The issuance of Building Permits in areas with severe soils limitations shall be conditioned to required the incorporation of appropriated structural modifications to compensate for applicable limiting soil characteristics.

6. All existing street rights-of-way and any new streets established to serve future development projects shall be improved to the specifications of the County Engineer.

7. All subdivision of lands shall conform to State and County Subdivision Regulations.

8. All development projects, except those approved under a conditional use permit, shall be subject to site plan review and approval by the Planning Commission and subject to such conditions of approval for development as the Commission deems appropriate to ensure conformance with the adopted development standards and policies for the Bellemont Area.

Appendices

Appendix A: Ownership Patterns

(Ownership of Properties as of December, 1984)

Property Owner	Assessor's Parcel #	Acreage
Raymond Educational Foundation P.O. Box 1423 Flagstaff, AZ 86002	116-01-001A	11.29
Raymond Educational Foundation	116-01-001B	4.79
Raymond Educational Foundation Dennis Gray 3300 N. E. 27th Ave. - Apt. 94 Vancouver, WA 98661	116-01-002A	7.05
Curtis and Margie Knudsen P.O. Box 33 Bellemont, AZ 86015	116-01-002B	8.76
Daniel Real Jack Dees 2636 W. Orangewood Phoenix, AZ 85021	116-01-003A	3.00
Thomas Ruth Box 26 Bellemont Station Bellemont, AZ 86015	116-01-004	2.08
Chicago Title Agency of Arizona Trust #607 3500 N. Central Ave. Phoenix, AZ 85012	203-35-007	2.45
Chicago Title Agency	203-35-010B	69.27
L.C. and Mary Caughran 5537 W. Frier Dr. Glendale, AZ 85301	203-40-001	30.00
Chicago Title Agency	203-40-002B	77.50
Chicago Title Agency	203-40-002C	38.50
Tottie Yamato P.O. Box 1093 Wickenburg, AZ 85358	203-40-003	1.70
Maud Thompson / Treva Lint 2212 W. Curry St. Chandler, AZ 85224	203-40-004A	1.20
William Warner Box 17 Bellemont Station Bellemont, AZ 86015	203-40-004C	.87

Property Owner	Assessor's Parcel #	Acreage
A.M. Persons P.O. Box 81052 San Diego, CA 92138	203-40-004D	.72
Helen Harr Pauline Williams 4 Pine Wood Circle Arkadelphia, AR 71923	203-40-005	1.58
J.E. Whipp Box 66 Bellemont Station Flagstaff, AZ 86001	203-40-006	1.17
Maybelle Melton C/O Keffe Realty Co. Inc. 457 Andra Court Cheyenne, WY 82009	203-40-007	29.70
Jack and Clare McCracken 397 Malpais Lane Flagstaff, AZ 86001	203-40-009	3.90
Museum of Northern Arizona, Inc. Rt. 4 Box 720 Flagstaff, AZ 86001	203-47-001B	14.00
Programmed Land, Inc. 7745 E. Redfield Rd. #600 Scottsdale, AZ 85260	203-47-001C	6.10
Len Martinson Bellemont Truck Center P.O. Box 45 Bellemont, AZ 86015	203-47-003	7.27
Len Martinson	203-47-004B	9.90
Chicago Title Agency	204-02-001A	62.10
Sixth Avenue Apartments P.O. Box 1136 Flagstaff, AZ 86002	204-03-001A	125.00
Charles and Adrienne Crockatt3340 S. Gillenwater Dr. Flagstaff, AZ 86001	204-03-001B	12.60
Chicago Title Agency	204-03-003	27.70
Chicago Title Agency	204-03-004	13.20
Chicago Title Agency	204-03-005	21.30

Appendix B: Soil Survey & Definitions

Soil Survey of the Bellemont Interchange Area

Most of the soils on ridges and on convex positions are similar to the Brolliar soils series. These soils are moderately deep over basalt bedrock, and have high clay content, predominantly montmorillonite. The resulting high shrink-swell potential, slow permeability, and moderate depth to rock (20 to 40 inches) severely limit most uses of this soil.

Deep, clayey soils occur along drainages and in concave depressions. These soils are similar to the Friana soils series, and are subject to common flooding and prolonged periods of ponding, especially where construction and cultural features have altered natural drainage. High shrink-swell potential and slow to very slow permeability are additional limitations of this soil.

Inclusions of soils with seasonal high water tables were noted in the northwest rectangular piece of land. Depth and content of rock fragments vary considerably from one area to another. Water tends to perch above layers of contrasting particle size, and saturated soil layers were encountered above cobbly and gravelly substratums.

The soils located near the Bellemont Interchange have areas of higher rock fragment content, but interpretations and limitations are otherwise the same. Definitions of the limitations ratings are also attached.

Limitations Ratings

Slight: soil limitation is the rating given soils that have properties favorable for the rated use. The degree of limitation is minor and can be overcome easily. Good performance and low maintenance can be expected.

Moderate: soil limitation is the rating given soils that have properties favorable for the rated use. This degree of limitation can be overcome or modified by special planning, design, or maintenance. During some part of the year the performance of the structure of other planned use is somewhat less desirable than for soils rated slight. Some soils rated moderate require treatment, such as artificial drainage, runoff control to reduce erosion, extended sewage absorption fields, extra excavation, or some modification of certain features through manipulation of the soil. For these soils, modification is needed for those construction plans generally used for soils of slight limitation. Modification may include special foundations, extra reinforcements, sump pumps, and the like.

Severe: soil limitation is the rating given soils that have one or more properties unfavorable for the rated use, such as steep slopes, bedrock near the surface, flooding hazard, high shrink-swell potential, a seasonal high water table, or low bearing strength. This degree of limitation generally requires major soil reclamation, special design or intensive maintenance. Some of these soils, however, can be improved by reducing or removing the soil feature that limits use, but in many situations, it is difficult and costly to alter the soil or to design a structure to compensate for a severe degree of limitation.

Suitability Ratings

Good: means the soils have properties favorable for the use. Good performance and low maintenance can be expected.

Fair: means the soil is moderately favorable for the use. One or more soil properties make these soils less desirable than those rated good.

Poor: means the soil has one or more properties unfavorable for the use. Overcoming the unfavorable property requires special design, extra maintenance, or costly alteration.

Restrictive Features

Restrictive Features are used to help explain the ratings for sanitary facilities, building site development, construction material, water management, and recreational development blocks. The following is a list of these features and their definitions.

Definitions

AREA RECLAIM.....Borrow areas are difficult to reclaim, and revegetation and erosion control on these areas are extremely difficult.

CEMENTED PAN.....Cemented pan too close to surface.

COMPLEX SLOPE.....Short and irregular slopes. Planning and construction of terraces, diversions, and other water-control measures are difficult.

CUTBANKS CAVE.....Walls for cuts are not stable. The soil sloughs easily.

DEEP TO WATER.....Deep to permanent water table during dry season.

DEPTH TO ROCK.....Bedrock is so near the surface that it affects specified use of the soil.

DROUGHTY.....Soil holds too little water for plants during dry periods.

DUSTY.....Soil particles detach easily and cause dust.

ERODES EASILY.....Water erodes soil easily.

EXCESS FINES.....The soil contains too much silt and clay for use as gravel or sand in construction.

EXCESS LIME.....The amount of carbonates in the soil is so high that it restricts the growth of some plants.

EXCESS SALT.....The amount of soluable salt in the soil is so high that it restricts the growth of most plants.

EXCESS SODIUM.....Exchangeable sodium imparts poor physical properties that restrict the growth of plants.

FAST INTAKE.....Water infiltrates rapidly into the soil.

FAVORABLE.....Features of the soil are favorable for the intended use. FLOODS Soil flooded by moving water from stream overflow, runoff, or high tides.

FRAGILE.....Soil easily damaged by use or disturbance.

FROST ACTION.....Freezing and thawing may damage structures.

HARD TO PACK.....Difficult to compact.

LARGE STONES.....Rock fragments greater than three inches across affect the specified use.

LOW STRENGTH.....The soil has inadequate strength to support loads.

NO WATER.....Too deep to ground water.

NOT NEEDED.....Practice not applicable.

PERCS SLOWLY.....Water moves through the soil slowly, affecting the specified use.

PERMAFROST.....The soil contains frozen layers throughout the year.

PIPING.....The soil is susceptible to the formation of tunnels or pipe-like cavities by moving water.

PITTING.....The soil is susceptible to the formation of pits caused by the melting of ground ice when the plant cover is removed.

PONDING.....Soil in closed depressions inundated by standing water that is removed only by percolation or evapotranspiration.

POOR OUTLETS.....Surface or subsurface drainage outlets are difficult or expensive to install.

ROOTING DEPTH.....A layer that greatly restricts the downward rooting of plants occurs at a shallow depth.

SALTY WATER.....Water too salty for livestock consumption.

SEEPAGE.....Water moves through the soil so quickly that it affects the specified use.

SHRINK-SWELL.....The soil expands on wetting and shrinks on drying, which may cause damage to roads, dams, building foundations, or other structures.

SLIPPAGE.....Soil mass is susceptible to movement downslope when loaded, excavated or wet.

SLOPE.....Slope too great.

SLOW INTAKE.....Water infiltrates slowly into the soil.

SLOW REFILL.....Ponds fill slowly because permeability of the soil is restricted.

SMALL STONES.....Rock fragments that are three inches or less across may affect the specified use.

SOIL BLOWING.....Soil easily moved and deposited by wind.

SUBSIDES.....Settlement of organic soils or of soils containing semi-fluid layers.

THIN LAYER.....Suitable soil material is no thick enough for use as borrow material or topsoil.

TOO ACID.....The soil is so acid that growth of plants is restricted.

TOO CLAYEY.....Soil slippery and sticky when wet and slow to dry.

TOO SANDY.....Soil soft and loose; droughty and low in fertility.

UNSTABLE FILL.....Banks of fill are likely to cave in or slough or uneven settlement is likely.

WETNESS.....Soil wet during period of use.

Data Sources

Arizona Department of Health Services' Bureau of Water Quality Control (Mike Neher - Flagstaff Branch)

Arizona Department of Transportation (Julian Diaz - Flagstaff Branch) (Ray Gordon, Robert Adams and Mike Hall - Phoenix Branch)

Arizona Public Service (Don Smith - Flagstaff Branch)

"Bellemont Properties master Plan and Report" prepared by Don Ziemba - Coconino Engineering and Surveying Company

Cline, Platt - Northern Arizona/Flagstaff historian

Coconino County Assessor's Office Records

Coconino County Community Development Department Records

Coconino County Environmental Health Department - conversations with Dan Smith, Director, and Blair Davis

Coconino County Road Department - conversations with Bill Howells and Steve Bell

Coconino County Water Reference Book (1982), prepared by Joe Gibb

El Paso Natural Gas (Flagstaff Branch)

Federal Emergency Management Agency (Flood Insurance Rate Map - Community Panel number 040019-3575B effective date - November 16, 1983)

Griffen, Joyce - Northern Arizona University Associate Professor of Anthropology (Parks-Bellemont Historical Paper)

Northern Arizona University South Campus Library (Special Collections Section)

"Oak Creek Canyon Area Plan" prepared by Coconino County Community Development Department

Southern Union Gas (Flagstaff Branch) - conversations with Representative Bill West

United States Department of Agriculture; Soil Conservation Service (Flagstaff Branch)

United States Geological Survey "Bellemont Quadrangle Sheet" - 1963