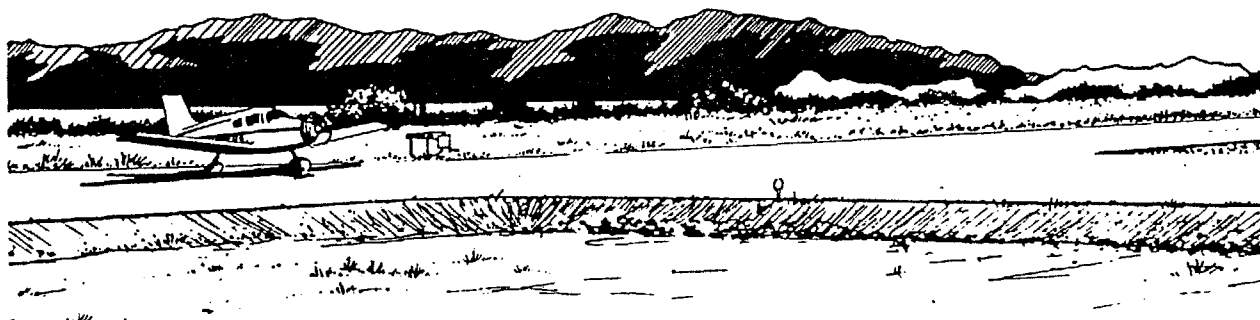


PRELIMINARY SITE ANALYSIS



Chapter Four

PRELIMINARY SITE ANALYSIS

Utilizing information developed in the preceding tasks, boundaries were established for the Benson Municipal Airport search area. These boundaries were based on driving time, geographic limitations (such as topography) and political jurisdictions. The search area establishes the general limits of that area considered feasible for locating an airport for maximum present and future benefit.

The facility requirements for the Benson Municipal Airport, which were determined in Chapter 3, established parameters for the site selection phase of this study. Using these parameters, a number of potential siting areas were identified for preliminary evaluation.

DETERMINATION OF POTENTIAL SEARCH AREA

An ideal site for the Benson Municipal Airport would be one that would provide maximum benefit to the community of Benson and the surrounding service area and would be conveniently located for the majority of

the users, without negatively impacting the surrounding environs. The potential airport search area has been defined to encompass the geographic limits believed to offer the potential to satisfy this siting objective.

Siting considerations for the Benson Municipal Airport were discussed and investigated by the Project Team and the Planning Advisory Committee. The limits of the airport search area were selected to take into consideration such things as topography, distance to the existing airports in the region, distance from major ground access corridors, proximity to the City of Benson, and jurisdictional boundaries.

On the west, the logical boundary of the search area was considered to be the Pima/Cochise County line. This border is approximately nine miles from the center of Benson and allows consideration of some of the less rugged topography of the area. The selected boundary to the north edge of the search area was based primarily on distance from I-10. Few roads exist in this area, and

of those that do, none are major transportation corridors and few are paved.

Consistent with FAA criteria for inclusion in the NPIAS, it was considered important to avoid areas within an approximate 30 minute drive time of other existing NPIAS airports. The thirty minute drive time from these airports played a role in the selection of search area boundaries to the east and south. On the east, the approximate thirty minute drive time from Cochise County Airport in Willcox, Arizona, became the eastern boundary of the Benson Municipal Airport search area.

The search area boundary to the south takes into consideration the 30 minute drive time from Sierra Vista Municipal Airport. While the 30 minute mark occurs just south of I-10 at State Route 90, the boundary was set farther south, approximately three miles south of I-10. This extension permitted the inclusion of areas to the east or west of SR 90 that would be outside the 30 minute drive time from Sierra Vista. The airport search area is depicted on **Exhibit 4A**.

SITE SELECTION CRITERIA

This section outlines the criteria considered in the site selection process for the Benson Municipal Airport.

ENGINEERING FACTORS

Engineering factors are those that relate directly to the construction, operation and maintenance of the airport. Engineering criteria considered in the preliminary site selection and evaluation are discussed in the following paragraphs. Please note that additional engineering considerations will be analyzed for each of the candidate sites in the

final site selection for the proposed Benson Municipal Airport.

Proximity To Population

The airport should be located so that it is convenient to the greatest number of residents in the area and users in the service area. Consideration must be given to population growth trends so that proximity factors related to long-range land use can also be included.

Access By Highway

Since ground travel time is a significant factor in evaluating the convenience of an airport site, airports should be located adjacent to or in close proximity to major highway access.

Runway Orientation

Each potential site must be evaluated on its ability to physically accommodate the ultimate stages of the airport without requiring major modifications. This includes runway orientation, all related airport facilities, utilities and potential industrial development.

Runway orientation should take maximum advantage of surface wind conditions in the area. In the case of the proposed Benson Municipal Airport, the preferred runway orientation is East-Northeast (ENE) to West-Southwest (WSW). If a site can accommodate a runway in this general direction, no crosswind runway would be required.

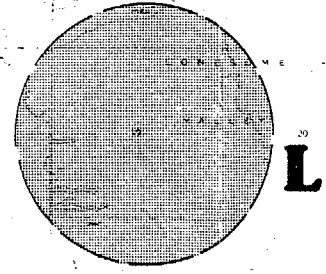
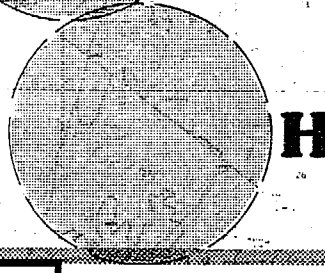
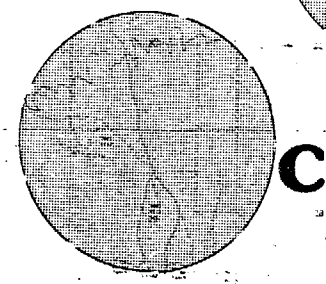
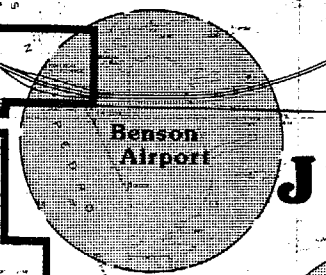
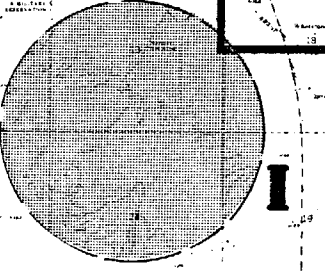
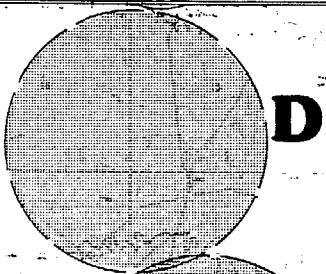
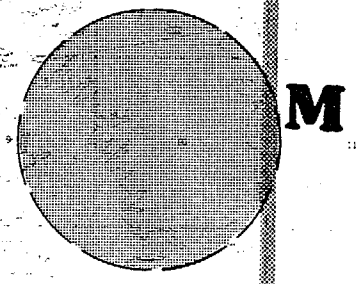
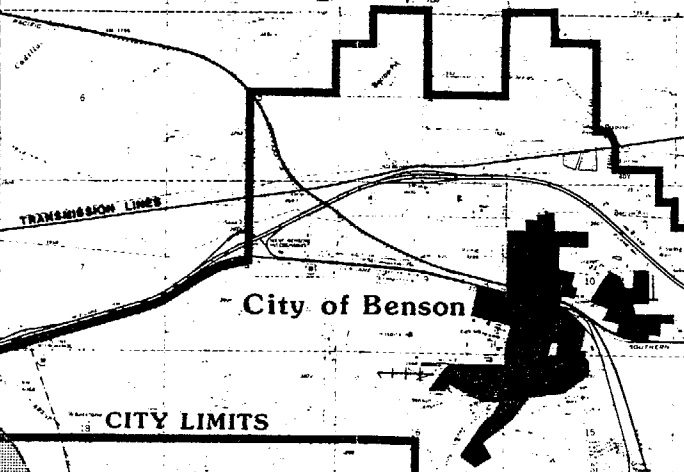
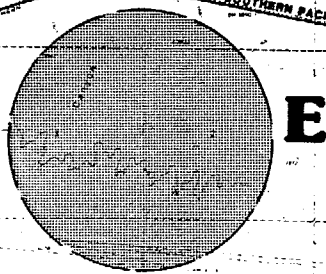
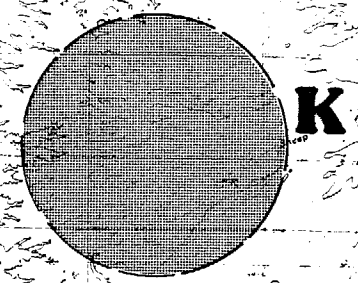
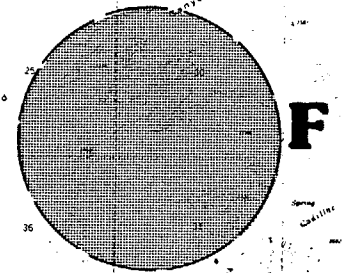
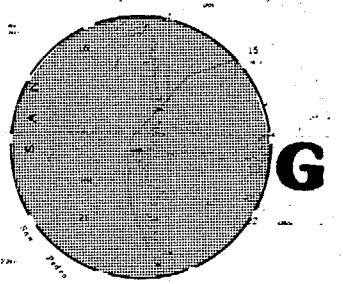
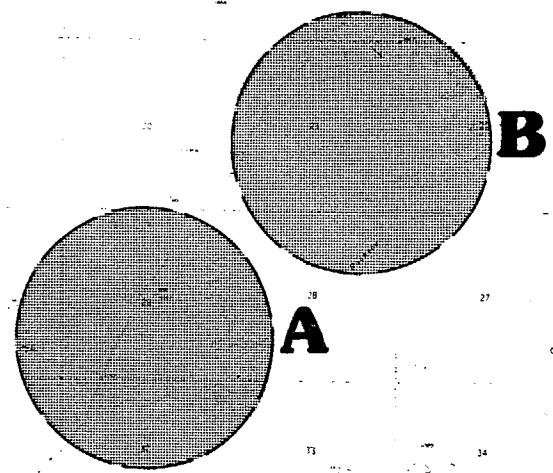
Topography

Topographic conditions are critical in the airport site selection process. It is not desirable to construct an airport on a site that

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PIMA CO. COUNTY CO.

AIRPORT-SEARCH AREA



CORONADO NATIONAL FOREST

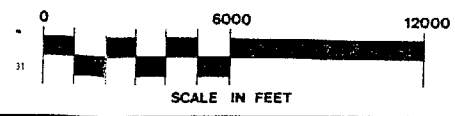


Exhibit 4A
PRELIMINARY SITES

would require major cut and fill operations, if more desirable alternatives are available. Consideration should also be given to the presence of any surrounding land forms that could potentially act as obstructions to the airport, in its initial or ultimate state.

Airspace Obstructions And Navigational Conditions

An review and analysis of existing airspace in relation to the airspace requirements for the new airport is important. In evaluating the airspace for the new airport, the potential airspace requirements that may be applicable to the ultimate development of the airport should be applied. The second factor in this category is the potential presence of obstructions that may limit aircraft operations or navigational procedures. Certain obstructions may be immovable (e.g., large land forms), while others, such as power lines, towers, buildings, etc., impose a cost of removal and relocation that must be considered. Certain navigational systems have operational specifications that may be incompatible with some terrain features or obstructions associated with a potential site. Limitations to navigational systems may restrict the planned ultimate development of the airport and its defined goal.

Acquisition Costs

Due to available access and potential development demands, land acquisition costs will vary. In the preliminary siting evaluation, distance from the population center and major road access were used to estimate relative land costs. While the preliminary siting areas represent private, Federal and State land, much of the land area within the potential siting areas is owned by the State of Arizona.

Site Development Costs

These factors involve a preliminary evaluation of a potential site as it relates to the cost of developing an airport. This includes preparing the site, removing obstructions, improving ground access, providing utilities, and relocating any existing structures or facilities.

Floodplain

Flood Insurance Rate Maps published by the U.S. Department of Housing and Urban Development, Federal Insurance Administration, are consulted to determine the limits of the 100-year floodplain. Location of floodplain within the siting area could severely prohibit the construction of the airport, or could result in significantly higher development costs.

ENVIRONMENTAL FACTORS

Criteria, related to environmental factors, that were considered in the screening of preliminary sites for the proposed airport, are discussed in the following paragraphs. Several additional environmental factors, which could prove to be significant in the siting of the proposed Benson Municipal Airport (e.g. biological and cultural resources), will be considered in the evaluation of the final candidate sites.

Land Use Compatibility And Relocation Needs

Each site must be evaluated for its potential impact on existing land use. Potential impacts include the required relocation of people, businesses, etc., as well as impacts to individuals or businesses from such factors as

noise, light emissions or changes in land use character.

Community Disruption

Each site must be evaluated to determine if the siting of the proposed airport would disrupt existing activities in the area. This factor considers primarily the temporary or permanent closing of access routes and communication links, as well as similar disruptions to general community activity which may be unique to a particular site.

Influence On Future Area Development

Each site must be evaluated for its influence on any future development plans, particularly those plans that would be considered incompatible with airport operations. A particular site may cause a dramatic shift in development trends and, therefore, must be reviewed with relation to existing plans.

IDENTIFICATION OF PRELIMINARY SITES

The goal of this preliminary site selection process is to identify general areas or sites within the designated search area that offer potential for siting of the proposed airport. Each of these sites will then receive a closer look and recommendations will be made regarding those considered to be the most desirable and feasible for the siting of the Benson Municipal Airport.

The criteria used in selecting these potential sites were limited to topographic conditions, land use and existing access. Thirteen preliminary siting areas were identified and are depicted on **Exhibit 4A**. Circles were used to depict these preliminary sites in order to allow for flexibility of runway orientation and placement of facilities.

The preliminary sites were evaluated against the established criteria to rate them according to their feasibility and desirability for the siting of the new airport. Specific factors considered in this analysis relate to both engineering and environmental considerations. The result of the site rating process is the identification of several candidate sites, those sites which exhibit the greatest potential for the siting of the Benson Municipal Airport. The following paragraphs describe each of the 13 preliminary sites identified for evaluation.

SITE A

Site A is located approximately 11 road miles west and north of downtown Benson, three miles north of the Mescal Road Interchange on I-10. The site is within one mile of the Southern Pacific Railroad and is owned by the State of Arizona. The site is free of development, with the closest residential land use located approximately one-half mile to the south. Above ground high voltage power lines are located within one-quarter mile of the site area to the south and just over one-half mile to the west. An existing road, which is partially paved, would provide access to the site.

The overall terrain of this siting area has an average slope of roughly three percent to the East-Northeast. The topography of the area would allow for an acceptable runway orientation, and therefore, no crosswind runway would be necessary.

SITE B

Site B is situated approximately 13 road miles west and north of downtown Benson, about one mile northeast of Site A. This site is farther from I-10, at a distance of five miles. As with Site A, this site is located north of the Southern Pacific Railroad, is free of development and is owned by the State of Arizona. Extra high voltage transmission lines

are located to the southeast and the northwest of the potential siting area. Access to the site would be provided by the same road identified for Site A.

The overall terrain of this area has an average slope of about two percent to the Northeast. The topography of the site allows for a runway configuration of North-South only. Since this orientation would not satisfy the 95 percent wind coverage requirement discussed in Chapter 1, a crosswind runway would be necessitated, however, the topography of this site would not permit the construction of the crosswind runway.

SITE C

This site is situated ten road miles to the west and south of downtown Benson. It is two miles due south of I-10 at the Mescal Road Interchange and is due north of the Coronado National Forest boundary. The land within this potential siting area is primarily privately owned with a small percentage in State ownership.

An existing dirt road provides access to the limited amount of development which has occurred within Site C. Several residential buildings and other structures associated primarily with ranching activities, are located within this site, while greater density residential development is located approximately one-half mile to the north of the site in Sections 17 and 18, Township 17 South, Range 19 East. According to an area plan for Empirita Ranch, provided by the Cochise County Planning Department, the area of Site C as well as areas to the north and west, are planned for residential, recreational and commercial development.

Above ground transmission lines are located more than one mile to the north of the area. The terrain of the area slopes to the North-Northwest at an average slope of about two percent. The topography of the site allows

for an acceptable runway configuration and, therefore, no crosswind runway would be required.

SITE D

Site D is located approximately six road miles to the west of downtown Benson, on the south side of I-10. This site is less than one-half mile south of the Interstate, at the existing Skyline Interchange. Much of the land within this area is owned by the State of Arizona, the balance is in private ownership. The residential development of Sections 17 and 18, referenced in Site C, is west of Site D. One cluster of structures was observed within this site during aerial reconnaissance activities.

The closest power line is approximately one-quarter mile to the north of the area, on the north side of I-10. The terrain of the area slopes to the North at an average slope of about three percent. The topography of this site allows for an acceptable runway configuration and, therefore, no crosswind runway would be necessitated.

SITE E

Site E, located approximately six road miles to the west and north of the Benson downtown area, is within one mile north of I-10. The site is free of development and is owned by the State of Arizona. High voltage transmission lines are located to the north and the south of the potential siting area, within one-quarter mile of the site boundary. Scattered residential development has occurred less than one mile to the southwest of the site.

A natural drainage way associated with Cornfield Canyon crosses the northwest section of this potential siting area. This drainage way is classified as part of the 100-year floodplain.

The overall terrain has an average slope of about two percent to the North-Northeast. The topography of the site would allow for an acceptable runway orientation for wind coverage, and, thereby eliminate the need for a crosswind runway.

SITE F

Site F is located nearly seven road miles to the west and north of the downtown Benson area. It is roughly three miles due north of the I-10/State Highway 90 Interchange. The majority of this land is publicly owned, primarily by the State of Arizona.

While no development has occurred within Site F, scattered residential development has developed along Ocotillo Road, located less than one mile to the east of the site. A dirt road currently provides access north to the site from I-10, or new access could be constructed to connect this site with Ocotillo Road.

As with Site E, Site F is affected by the 100-year floodplain of Cornfield Canyon Wash. The terrain within this potential siting area is widely varied, with slopes ranging from two percent to large areas of greater than 20 percent slope. The topography of this siting area would allow for an acceptable runway orientation for wind coverage, therefore, avoiding the need for a crosswind runway.

SITE G

This site is located roughly seven miles to the north of the City of Benson, with only about 20 percent of that distance routed on I-10. The remaining distance would be on Pomerene Road, which is only paved in close proximity of I-10. Agricultural land uses are present in the area and about one-half of the land is under State of Arizona ownership. No structures are currently located within the site; the closest residential development occurs over mile to the west of the siting area

along Ocotillo Road. An extra high voltage transmission line is situated just one-quarter mile to the south of the potential site.

Site G is located along the San Pedro River Valley and much of the potential siting area is within the 100-year floodplain. The terrain slopes to the west, toward the San Pedro River, at approximately one percent average slope. The topography and floodplain conditions of this siting area would restrict the runway to a general north-south orientation, which would necessitate a crosswind runway, however, the topography of this site would not permit the construction of the crosswind runway.

SITE H

Site H is located in the area of Sites C and D and is approximately eight miles to the west and south of I-10. Site H supports no development but is transected by an underground pipeline. As with Site C, Site H is located to the north of the Coronado National Forest boundary and is under private ownership. The closest existing residential land uses are located more than one mile to the northwest, in the area of Site C. Access to the site would most likely be provided by an existing dirt road which connects the site to the I-10/Skyline Interchange.

The topography of this site slopes to the North with an average slope of approximately two percent. The terrain of the area would allow for an acceptable runway orientation for wind coverage. No crosswind runway would be necessitated.

SITE I

Site I, adjacent to and south of I-10 and west of State Highway 90, is roughly four miles from downtown Benson. The area is nearly free of development with the exception of two clusters of buildings observed during aerial reconnaissance for the project. As with

many of the sites, Site I is partially owned by the State of Arizona.

The topography of the area is an average slope of three percent to the Northeast. The terrain would allow the siting of a runway with an acceptable orientation for wind coverage and, therefore, no crosswind runway would be required.

SITE J

Site J is the existing Benson Airport, located less than two miles east of downtown Benson. Site J is directly adjacent to and south of the Southern Pacific Railroad and I-10, and is directly east of Airport Road. The land within the siting area is privately owned with the exception of an area of State land to the east and southeast of the existing airport property. In addition to the airport property and vacant land, the area includes some agricultural land uses and scattered residential units associated with the agricultural activities. Above ground power lines are located approximately one mile north of the existing airport, parallel to the existing runway.

The San Pedro River Valley is located west of the site. A wash, which feeds into the San Pedro River, is located generally adjacent to and south of the airport property. This wash is located within the 100-year floodplain.

The overall terrain has an average slope of roughly one percent to the West-Southwest. The topography of the site would allow for an acceptable runway orientation for wind coverage, therefore, eliminating the need for a crosswind runway.

SITE K

Site K is located north of I-10, nearly seven road miles to the east and north of downtown Benson. Current access from Benson to the site is by way of I-10 for approximately four

miles and an unpaved roadway for the remaining three miles. This site is absent of development and the majority of this land is under private ownership. Above ground electric transmission lines are located within one-quarter mile of the area to the southeast and south.

The overall terrain of Site K has an average slope of about one percent to the West, Southwest. The topography of the site would restrict the runway orientation to that of north-south. Since this orientation would not satisfy the 95 percent wind coverage requirement, a crosswind runway would be necessitated, however, the topography of this site would not permit the construction of the crosswind runway. A natural drainageway, known as Sheep Wash, transects the south half of Site K, providing another constraint to development.

SITE L

Site L is located south of I-10, two miles east of SR 80, nearly four and one-half miles east and south of downtown Benson. Current access from Benson to the site is by way of I-10 for one and one-half miles and Airport Road for roughly two additional miles. The site is located east of Airport Road and, therefore, nearly one mile of new roadway would likely be required in order to connect this site to the existing access.

This site is primarily unpopulated and is almost entirely on privately owned property. A transmission line is located less than one-quarter mile to the east of the potential siting area.

The overall terrain of the site is nearly two percent to the West, Southwest. The topography of the site would restrict the runway orientation to that of northwest-southeast. Since this orientation would not satisfy the 95 percent wind coverage requirement, a crosswind runway would be necessitated, however, the topography of this

site would not permit the construction of the crosswind runway.

SITE M

Site M is located on the south side of I-10, nearly nine road miles from the east of downtown Benson. I-10 provides existing access for seven miles of this distance, with the remaining distance served by both paved and unpaved roadways. This siting area, which is approximately one-half mile north of the Southern Pacific Railroad, is entirely within the ownership of the State of Arizona. A pipeline transects the northern half of this siting area.

The overall terrain of Site M is nearly three percent to the Southwest. The topography of the site would restrict the runway orientation to that of northwest-southeast. Since this orientation would not satisfy the 95 percent wind coverage requirement, a crosswind runway would be necessitated, however, the topography of this site would not permit the construction of a crosswind runway.

PRELIMINARY SITE SCREENING ANALYSIS

The objective of the site screening effort is to evaluate the preliminary sites using a site rating analysis to determine which sites have the greatest overall potential. A matrix, consisting of engineering and environmental factors, was developed to weigh the advantages and disadvantages of the preliminary sites. This matrix was used to determine a single number rating for each site indicating the degree to which the site is capable of meeting the criteria outlined in the beginning of this chapter. Rating values from 0 to 10 were assigned. The following five definitions were used as a guideline to the rating process.

◆ Unacceptable (0)

A rating of zero indicates a site that fails to meet the criteria; or would require major changes to achieve acceptable conditions.

◆ Inadequate (2)

A rating of two indicates a site that includes factors that do not meet the criteria as well as some of the other sites; or, will require some changes to achieve acceptable conditions.

◆ Acceptable (5)

A rating of five indicates a site that satisfactorily meets the criteria.

◆ Good (8)

A rating of eight indicates a site that properly meets the criteria; and includes some advantages related to the criteria.

◆ Best (10)

A rating of ten indicates a site that best meets the criteria and has major advantages.

The results of the preliminary site screening analysis are presented in matrix form in **Table 4A**. This table presents the ratings selected for each of the factors, as well as the overall rating totals. Based on this evaluation, Sites A, D, I and H were rated highest overall and were recommended for further analysis in the final site selection process.

Site A, with the highest overall ranking, presented a relatively high score for engineering factors primarily due to favorable conditions for runway orientation, topography and floodplain. Site A also ranked relatively high for the environmental factors considered, particularly land use compatibility and future area development.

Site D, with the second highest overall score, excelled primarily in the factors related to engineering, such as proximity to highway access, proximity to population, floodplain and obstructions. In addition, Site D had a lower rating than that of Site A for the environmental factors considered. Site I was very similar to Site D, having virtually the same overall score. As with Site D, Site I ranked high in the categories of proximity to population, highway access, and obstructions, however, it ranked lower for runway orientation, topography and site development costs. Site I ranked high on the environmental factors, particularly land use compatibility and future area development, as did Site A.

Site H, located in relatively close proximity to Site D, has some of the same advantages, namely lack of obstructions and floodplain, and close proximity to population. The environmental factors for Site H include a low rating for future area development due to its proximity to the Empirita Ranch area.

A review of the preliminary sites and the associated evaluations was conducted by the Planning Advisory Committee. Based upon their review, four final candidate sites from this list were selected for further evaluation.

TABLE 4A
Preliminary Site Screening
Benson Municipal Airport

Rating Factors	Preliminary Sites												
	<u>A</u>	<u>B*</u>	<u>C</u>	<u>D</u>	<u>E</u>	<u>F</u>	<u>G*</u>	<u>H</u>	<u>I</u>	<u>J</u>	<u>K*</u>	<u>L*</u>	<u>M*</u>
<u>Engineering Factors</u>													
Proximity to population	6	4	7	9	8	7	7	8	10	10	8	10	8
Access by highway	8	6	10	10	7	4	7	7	10	10	4	4	8
Runway orientation	10	0	10	9	9	10	0	9	5	10	0	0	0
Topography	10	5	5	8	8	5	6	5	2	5	4	7	4
Airspace Obstruction													
Navigational Cond.	5	6	10	10	8	8	2	10	10	5	5	2	2
Acquisition Costs	7	7	5	4	5	5	7	5	4	5	5	7	4
Site Development Costs	8	5	7	8	6	3	8	5	5	7	2	6	6
Floodplain	10	10	10	10	2	4	2	10	10	3	10	10	10
Subtotal	64	43	64	68	53	46	39	59	56	55	38	46	42
<u>Environmental Factors</u>													
Land Use Compatibility	8	8	0	2	4	8	3	5	8	3	8	3	8
Community Disruption	5	5	2	5	5	5	5	5	5	5	5	5	5
Future Area Development	8	8	0	2	8	8	5	3	8	5	8	5	8
Subtotal	21	21	2	9	17	21	13	13	21	13	21	13	21
Overall Total	85	64	66	77	70	67	52	72	77	68	59	59	63

* Sites where desirable runway orientation cannot be achieved due to topographic conditions.