SECTION 6: ALTERNATIVES ANALYSIS

6.1 - Development of Alternatives

6.1.1 - CEQA Requirements

If a DEIR identifies one or more significant impacts, CEQA Guidelines Section 15126.6 requires consideration of alternatives to the proposed project in the DEIR. More specifically, Section 15126.6 prescribes the following:

> **Alternatives to the Proposed Project –** Describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives.
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> **Purpose –** Because an EIR must identify ways to mitigate or avoid the significant effects that a project may have on the environment, the discussion of alternatives shall focus on alternatives to the project or its location which are capable of avoiding or substantially lessening any significant effects of the project, even if these alternatives would impede to some degree the attainment of the project objective, or would be more costly.
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> **Selection of a Range of Reasonable Alternatives –** The range of potential alternatives to the proposed project shall include those that could feasibly accomplish most of the basic objectives of the project and could avoid or substantially lessen one or more of the significant effects. The EIR should briefly describe the rationale for selecting the alternatives to be discussed. The EIR should also identify any alternatives that were considered by the lead agency but were rejected as infeasible during the scoping process and briefly explain the reasons underlying the lead agency's determination.
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> **Evaluation of Alternatives –** The EIR shall include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed project. A matrix displaying the major characteristics and significant environmental effects of each alternative may be used to summarize the comparison. If an alternative would cause one or more significant effects in addition to those that would be caused by the project as proposed, the significant effects of the alternative shall be discussed but in less detail than the significant effects of the project as proposed.
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> **Rule of Reason –** The range of alternatives required in an EIR is governed by a "rule of reason" that requires the EIR to set forth only those alternatives necessary to permit a reasoned choice. The alternatives shall be limited to ones that would avoid or substantially lessen any of the significant effects of the project. The EIR need examine in detail only those alternatives that the lead agency determines could feasibly attain most of the basic objectives of the project while reducing one or more potential significant environmental impacts of the project to less than significant levels.

6.1.2 - Project Impacts

Sections 4.1 through 4.17 of the DEIR determined that the proposed project would produce the following significant impacts, even with the implementation of feasible mitigation: 1) aesthetics (22 sites), and 2) cultural resources (Margarita site only). Therefore, the project alternatives will focus on reducing or eliminating these impacts.

6.1.3 - Project Objectives

The following objectives have been established for the PSEC project, and will serve as the basis for considering the alternatives and their associated environmental impacts.

1) Provide appropriate and adequate voice and data communication coverage to County emergency services personnel and their cooperators over at least 95 percent of the County's land area.

2) Allow for interoperability between providers in a manner that assures adequate communication capability during emergency incidents (which include wildfires, earthquakes, large-scale releases of hazardous substances and other natural or man-made disasters) that cross jurisdictional boundaries or require multiple-agency cooperation.

3) Provide a secure voice and data communication network that is not dependent upon commercial facilities for its operation.

4) Allow for co-location of facilities with other governmental agencies and jurisdictions.

5) Develop the system with as minimal impact to the environment as possible while still meeting coverage needs and project objectives.

6) Develop the system cost-effectively and in a manner that provides the highest value and public service to the County and its citizens.

7) Design and construct the proposed voice and data communication system to assure operational capability by December 2010.

6.1.4 - Constraints on the Development of Alternatives

This project is somewhat different from other types of projects in that radio towers have limited options in so far as to where they can be placed while still fulfilling their intended purpose. A housing development or shopping center, for instance, may have several locations where it can be placed and still meet project objectives. The physical characteristics of radio science, on the other hand, place specific physical constraints on where a facility can be located while still meeting service needs. Radio waves cannot go through mountains, for example, and the strength of a signal decreases the further away one gets from a transmitter. Another consideration is the fact that radio networks are interconnected systems, meaning that each tower must be able to "see" other towers in a line-of-sight manner in order to transmit and receive signals to the rest of the network. In the case of radio, especially in an area as topographically diverse as Riverside County, there are few options in regards to tower placement if a particular area needs to be covered. This fact is particularly applicable to

emergency services communication systems. In non-emergency networks (cellular telephones, etc.), a lack of coverage in a certain area is an inconvenience, whereas in an emergency services system, a lack of coverage could directly impact the ability of a provider to meet mission objectives (i.e., protection of life and property).

These facts make alternate site selection for radio systems uniquely challenging. Nevertheless, the County went through a comprehensive site selection process with the goal of developing a system that provided the greatest level of radio coverage, while still minimizing impacts to the greatest extent possible. The section below provides an overview of the site selection process.

6.1.5 - Site Candidate Selection Process

For most sites, candidate locations were chosen based on their ability to provide coverage to particular areas that had been identified as critical to meeting project objectives. Most sites began with several candidates that were identified as possible locations from which coverage objectives could be met. Over 150 candidate locations were identified, from which approximately 50 final sites were ultimately to be selected. Multiple candidates were identified to allow for design flexibility should it be determined after further investigation that a specific location was not suitable. Reasons for a candidate's lack of suitability and subsequent rejection could include lack of suitable radio coverage, undesirable environmental impacts, acquisition or access constraints, cost, and other factors. Since these potential constraints could not be identified without further investigation, multiple candidates were identified for each site, with the understanding that many of the candidate locations would be dropped from consideration once a due-diligence investigation had been conducted. In this manner, the candidate that best met project objectives with the fewest constraints could be identified and ultimately selected. Table 6-1 lists the approximately 150 candidate sites and the County's reasons for rejecting two-thirds of the sites for development.

Environmental Constraints Analysis and System Design Process

As part of the due-diligence process noted above, the County also undertook an extensive environmental constraints analysis process at each of the candidate locations to determine what environmental effects could be anticipated should development occur. Over a period of approximately 12 months, environmental specialists visited each of the candidate locations to assess potential impacts. Assessment teams included a biologist, an archaeologist, and a project manager with overall expertise in a variety of environmental disciplines. In all, these assessment teams visited and assessed over 150 candidate locations. The team's findings were provided to the overall project design team on an ongoing basis. Together with input from other specialists (radio engineers, realty specialists, etc.), the project design team was able to consider all potential constraints that might be associated with a particular candidate location. Using this information, the team could identify the site location with the fewest constraints to best meet the requirements of the project. For additional information on candidate locations and their reasons for rejection, please see Table 6-1.

Final Site Selection Process

Following the constraints analysis and design process described above, final site selection was undertaken using the information provided by all participants. As has been said, the first priority for any selected site was the provision of adequate radio coverage. During the site selection process, many otherwise suitable sites were rejected because they could not provide adequate coverage to specific areas. Other sites were rejected on environmental grounds, or because they could not be feasibly acquired, accessed, or constructed. The end result of the site selection process are the proposed site locations presented and analyzed in this DEIR.

6.2 - Alternatives to the Proposed Project

As described above in Section 7.1.1, CEQA requires Lead Agencies to assess a range of reasonable alternatives, as well as a "No Project" alternative. The discussion below analyzes several alternatives to meet this requirement.

6.2.1 - No Project Alternative

Under this alternative, the project would not be built and the County would continue to utilize its existing emergency services radio network into the foreseeable future. No new facilities would be built, and all of the environmental impacts identified in this DEIR would be avoided.

The obvious disadvantage to this alternative would be that the citizens of the County would continue to be served by an emergency services communication network that currently does not provide adequate service to nearly 40 percent of the County. Agency needs in regards to data and information transfer would not be met, and this condition would only worsen as population growth and development in more remote parts of the County continues. County emergency services personnel would be less able to respond effectively to large-scale emergencies (wildfires, etc.) and would not be able to adequately interface with other agencies or across jurisdictional boundaries. While it is true that this alternative would avoid all of the significant impacts identified in the DEIR, it would not meet any of the objectives of the project. Not building the project would have significant and far-reaching repercussions for the County in regards to its ability to adequately protect its citizens.

6.2.2 - Alternate Locations Alternative

This alternative would build a comparable number of towers as the proposed project, but those towers would be in different locations than what has been proposed. The reasons for considering this alternative center around the possibility that the County may be able to select alternate sites than the ones proposed and thus minimize or eliminate some or all of the project's identified significant impacts.

Table 6-1: Alternate Candidate Locations

Site Name	Number of Candidate Locations Analyzed	Reason Candidates Were Rejected[2]						
		Inadequate Coverage[3]	Acquisition[4]	Access[5]	Cost[6]	Aesthetic Constraints[7]	Biological Resources Constraints[8]	Cultural Resources Constraints[9]
Arlington	4	X						
Avocado Flats	4	X		X				
Big Maria[1]	1							
Black Eagle	3		X	X	X			
Black Jack	3							X
Blue Mountain	4			X	X			X
Box Springs[1]	1							
Brookside	4	X	X	X				
Cajalco	3		X	X				
Corn Springs	1							
Corona	2		X		X			
El Cariso	3	X		X		X		
Elsinore Peak[1]	1							
Estelle Mountain	5		X	X	X	X	X	
Glen Avon	5	X	X	X				
Green River	8	X	X	X	X			
Homeland	3		X		X			
Iron Mountain	4	X	X	X	X			
Joshua Tree	2		X					
Lake Elsinore	4	X	X	X	X			

Table 6-1 (Cont.): Alternate Candidate Locations

Site Name	Number of Candidate Locations Analyzed	Reason Candidates Were Rejected[2]						
		Inadequate Coverage[3]	Acquisition[4]	Access[5]	Cost[6]	Aesthetic Constraints[7]	Biological Resources Constraints[8]	Cultural Resources Constraints[9]
Lake Mathews	2		X		X			
Lake Riverside	3		X				X	
Leona	4				X			
Line	5	X	X	X	X			
Margarita	5	X	X	X	X		X	
Marshell	5	X	X					
Mead Valley	3				X			
Mecca Landfill	4		X	X		X	X	X
Menifee	2				X			
Morongo	5	X	X	X	X			
Paradise	4	X	X		X			
Quail Valley	7	X	X		X	X		
Rancho Carillo	6	X	X		X	X	X	
Ranger Peak	3				X			
Red Mountain[1]	1							
Redondo Mesa	5	X	X		X			
Rice	2				X			
Road 177	4	X			X			
Santa Rosa Peak[1]	1							
Santiago Peak	5	X	X		X			

Table 6-1 (Cont.): Alternate Candidate Locations

Site Name	Number of Candidate Locations Analyzed	Reason Candidates Were Rejected[2]						
		Inadequate Coverage[3]	Acquisition[4]	Access[5]	Cost[6]	Aesthetic Constraints[7]	Biological Resources Constraints[8]	Cultural Resources Constraints[9]
Spring Hill	2			X	X			X
Sunnyslope	5	X	X	X				
Temescal	4	X	X	X				
Timoteo	11	X	X	X		X		
Vaquero	3		X		X	X		
Vidal Junction	3	X						
Whitewater[1]	1							
Wileys Well	1							
Winchester	5	X	X	X				

Notes:
1 – This is an existing County communication site that will be upgraded as part of the proposed project. For this reason, there was only one candidate considered.
2 – Some candidates were rejected for more than one reason, so the number of reasons for rejections may add up to more than the number of sites considered
3 – Candidate was rejected because the location would not meet the necessary coverage footprint, or would not provide adequate coverage to a specific target area or line-of-sight to the network.
4 – Candidate was rejected because the site could not be acquired by normal means outside of eminent domain
5 – Candidate was rejected because adequate access (road and power easements, etc.) to the site was not available
6 – Candidate was rejected due to excessive costs associated with acquisition, construction, or mitigation
7 – Candidate was rejected due to the likelihood of significant aesthetic and visual resource impacts
8 – Candidate was rejected due to the likelihood of significant impacts to biological resources
9 – Candidate was rejected due to the likelihood of significant impacts to cultural resources

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As discussed above in Section 6.1.4 and Section 6.1.5, the County assessed over 150 candidate locations before it selected the approximately 50 sites analyzed in this DEIR. In this sense, the County has already considered many alternative locations. Table 6-1 provides a listing of the number of candidates that were assessed for each site and the reason(s) for the rejection of candidates. At this point, the County believes it has conducted sufficient due-diligence in the site selection process. For many sites, the supply of available candidates has essentially been exhausted and the proposed locations are the best that are available given numerous site-specific constraints.

Still, it is theoretically possible that other candidates could be identified that could avoid some or all of the significant environmental effects of the project. However, it is likely that radio coverage in many areas would be compromised. In some cases, sites were specifically selected to provide radio coverage to a particular area that has proven problematic from a law enforcement or fire protection perspective. In some cases, there simply is no alternative to providing coverage to these areas. Selection of an alternate site would essentially render these critical areas uncovered.

Candidate sites were also rejected for other reasons besides coverage. Some candidates could have provided the needed coverage, but they simply were not accessible or acquirable. Other candidates were rejected because they would have impacted sensitive biological or cultural resources.

Even if coverage issues could be resolved and the selection of alternate sites could be carried out while still meeting project objectives, the core challenge with this alternative is that the project's environmental effects would remain essentially unchanged. The project would still require the construction of communication towers in areas where their aesthetic impacts would be significant. It is extremely unlikely that enough alternate sites could be identified that would lessen this impact to a less than significant level. Therefore, this alternative is not environmentally superior to the proposed project.

6.2.3 - Alternative Technologies Alternative

This alternative would abandon the project as currently designed and instead provide emergency communication services through alternative technology. These technologies could include the use of satellites or other services that would not require the use of land-based networks and thus avoid the significant environmental effects of the proposed project.

The challenge with this alternative is that it is simply not possible with current technologies. While satellite communication sounds like an easy answer to communication challenges, the ability to offer these types of services in a reliable and safe manner is probably many years away. For instance, satellite coverage typically requires line-of-site connectivity between the user and the satellite. For this reason, satellite communications do not work particularly well in buildings or in areas where physical obstructions block the line-of-site. This is particularly problematic for law enforcement and fire personnel, who regularly work inside buildings and in situations where reliable communication is critical.

Satellite transmitters also present challenges in regards to the safety of users. Most persons view satellite technology based on experience with consumer electronics that utilize satellites, such as hand-held GPS units or satellite television. The critical distinction with these products, however, is that they are *receiving* devices only. They themselves do not *transmit* a signal. The signal they receive is actually a very weak signal due to its distance from the transmitter (i.e., the satellite). For these devices to be able to transmit with sufficient strength to actually communicate with the satellite, the transmission signal from the device would need to be substantially higher than levels considered safe for a hand-held device. Even short-term exposure to these excessive levels of signal strength would have implications for the safety of emergency service providers.

If this alternative were at all feasible and safe, it would certainly be the environmentally superior alternative simply because it would meet all of the project's objectives while completely avoiding all of the environmental impacts of the proposed project. However, it is not possible at this time to implement this technology in an effective or safe manner. Perhaps in the future, this may be considered as a viable alternative, but at the present time it is not. Therefore, this alternative is not environmentally superior to the proposed project.

6.2.4 - Utilization of Existing Cellular Telephone Network Alternative

This alternative would require the County's emergency services providers to utilize existing commercial cellular telephone networks to communicate. The County would not need to build any towers under this alternative, and all of the impacts identified in this DEIR would be avoided.

The challenge with this alternative is that it simply would not provide the level of coverage and reliability that is required for an emergency services communication system. Anyone who has had experience with cellular telephones knows that coverage is inconsistent in many parts of the County and that reliability is far from certain. Buildings, topographic features, and other obstructions can block signals. Large portions of the County are not covered by commercial service and probably never will be due to the lack of consumer demand in more remote areas.

Cellular networks are also not capable of supporting the large quantities of data transmission that are required of an emergency services network. Most importantly, cellular networks do not provide instant, real-time communication. Typically, several seconds are required to obtain a signal (assuming a signal is available), and this type of delay is not acceptable in the emergency situations that providers are confronted with on a daily basis.

Additionally, commercial radio networks already carry a heavy traffic load, with the majority of calls being made by businesses and the general public. All these calls would be competing with the County's public safety personnel for airtime, potentially preventing calls critical to the protection of life and property from being made at a crucial moment. It is a widely known fact that commercial networks become congested to the point of failure during emergencies or disasters. This is not a tolerable situation for public safety agencies.

If this alternative were feasible, it would be an environmentally superior alternative simply because it would avoid all of the environmental impacts of the proposed project. However, it is simply infeasible and would not meet the project objectives and the needs of emergency services providers and the public they serve. Therefore, this alternative is not environmentally superior to the proposed project.

6.2.5 - Taller Towers Alternative

This alternative would provide taller towers, but fewer of them. The reason for considering this alternative would be that taller towers can provide coverage to a larger area, and therefore fewer towers would be needed. This would have the effect of reducing the number of towers and thus the impacts associated with them.

For this alternative to actually reduce the number of towers, the towers would all need to be substantially taller than what is now proposed. A 330-foot guy-line supported tower approaches the upper limit of feasibility for construction in this area. For example, if it is assumed that if all of the towers were increased to 330-feet in height, the number of towers might be reduced from approximately 50 to less than 30. This reduction in numbers is an assumption, and is not the result of any technical analysis that has been undertaken by the County. The reason this analysis has not been done is because there are already known constraints associated with radio science that indicate that this alternative is not feasible.

Despite what could commonly be assumed, doubling the height of a tower does not necessarily provide twice the area of coverage. This could theoretically be the case if an area were totally flat and devoid of any topographic relief. This approach could work in flat areas of the country, but it is not effective in Riverside County. The County has extreme variances in topographic relief, ranging from 228 below sea level at the Salton Sea up to 10,804 feet above sea level at San Jacinto Peak. In between these extremes lies an enormous variety of terrain, some of which is very rugged and broken. The variations within this terrain create “shadows” in radio coverage when signals are blocked by topographic features. In these situations, a smaller tower, strategically placed, can reach those areas that would be in shadow from a larger tower. It typically takes several smaller towers to effectively cover areas that would otherwise be in shadow if only a single taller tower were used.

Taller towers can sometimes actually extend coverage into areas where their signals can cause interference with other users and jurisdictions. Towers must be sized carefully so that they will provide coverage to a desired area while avoiding “bleeding” excessive signal to areas where coverage is neither needed nor desired. The FCC regulates this type of interference, and taller towers can contribute to severe interference conditions in these situations.

In regards to aesthetic impacts, having fewer but taller towers could possibly reduce these impacts, but not in any meaningful sense. Taller towers can be seen from greater distances and tend to be more intrusive. They require strobe lights and high-visibility paint schemes that add to the aesthetic

impact. There is essentially no way to feasibly mitigate the impact of an extremely tall tower. Depending on their design, taller towers can also create greater areas of ground disturbance and can thus cause greater impacts to biological and cultural resources. Considering the greater aesthetic impact that would arise from taller towers, together with the technical constraints incumbent upon such a system, this alternative is not environmentally superior to the proposed project.

6.2.6 - Lower Towers Alternative

This alternative would provide greater numbers of towers of lower height to cover the same area. Under this alternative, the number of towers would increase by a substantial amount from what is proposed. The purpose of this alternative would be to lessen the aesthetic impacts of the project by using smaller towers exclusively. While the number of towers would actually increase, the idea would be that smaller towers would be less obtrusive and easier to conceal than taller towers.

This alternative could potentially lower the aesthetic impacts of the proposed project. Smaller towers are generally considered less visually obtrusive than taller towers, and if concealment technology for these towers were ever to become feasible, it could be possible to conceal these towers at some point in the future. However, while this approach could possibly reduce aesthetic impacts, it would also create additional impacts in other areas. More towers would create ground disturbance in more areas, and would also require more roads, more powerlines, and would consume more resources during construction and operation. The site-specific impacts associated with each tower would impact more people, since more towers would necessarily be located in areas where people could possibly be affected by them. The financial cost of the project would increase substantially, since more towers would mean mores sites to acquire and more facilities to construct.

If only aesthetic impacts are considered and no other impacts are assessed, the construction of a greater number of towers of lower height could be considered “environmentally superior” to the proposed project. However, building more towers would increase other impacts, such as those associated with biological and cultural resources, air quality, and long-term commitment of resources. Therefore, on balance, this alternative is not considered environmentally superior to the proposed project.

6.3 - Environmentally Superior Alternative

When taken as a whole, none of the potential alternatives are environmentally superior to the proposed project because they would either not reduce one or more significant impacts of the project, would result in different or increased impacts compared to the proposed project, or would not achieve the objectives of the project to the same degree as the proposed project. This conclusion is supported by the extensive effort the County undertook to identify tower locations that would minimize the number of sites and related environmental impacts while maximizing service coverage. For these reasons, the proposed project is considered environmentally superior to other feasible potential network options.