SECTION 6
SUMMARY OF IMPACTS

The alternatives analysis resulted in retention of the Proposed Goodsprings Plant Site (Alternative E), the Primm Plant Site (Alternative F), and the No Action Alternative for further consideration.

The Proposed Goodsprings Plant Site would be located on a 30-acre parcel; an additional 10 acres would be used as a temporary laydown area. Natural gas supply to the plant would be from the KRGT pipeline which is adjacent to the plant site. Development of the site also would require improvements to the permanent northern access road and temporary southern access road and installation of a telecommunications line. The plant site, temporary laydown area, access roads, and telecommunications line would be on BLM property.

The Primm Plant Site would be co-located on industrial-use private land, with the Reliant Bighorn Generating Facility. Existing access roads and telecommunications right-of-way would be used; however, a 3.2-mile-long natural gas supply pipeline and a metering station would be required on BLM land.

Regardless of plant site location, a water treatment plant that would be constructed on one of two 0.7-acre parcels near the Southern Nevada Correctional Center in Jean. The parcels are located north of Prison Road.

A water supply pipeline to the Goodsprings Plant Site would largely parallel the UPRR to the BLM-designated Utility Corridor that would be used to interconnect the power plant to Mead Substation. The pipeline would be co-located within the transmission line corridor to the vicinity of the Goodsprings Site. Three plant site access options were evaluated to route the pipeline from the transmission line corridor to the plant site. Two routes would extend south of a small mountain near the plant site, one route would cross over the mountain.

Two water supply pipeline routes were evaluated for the Primm Plant Site. One route would extend directly from the water treatment plant to the plant site, parallel to the UPRR ROW. The other route would parallel the UPRR to the previously referenced utility corridor where it would be co-located within the project transmission line corridor to the plant site.

Development of either the Goodsprings Plant Site or the Primm Plant Site would require interconnections with Mead Substation and Table Mountain Substation.

Two alternative routes were evaluated for a single-circuit transmission line from the Goodsprings Plant Site to Mead Substation (Ivanpah-Mead #2). A double-circuit line also would be required from the plant site to Table Mountain Substation (Ivanpah-Table Mountain #1 & #2). Lines also would interconnect to the existing Pahrump-Mead Transmission Line.

Four Goodsprings Plant Site access options were identified to interconnect the previously referenced five circuits to the Ivanpah Energy Center, Mead Substation, Table Mountain Substation, and the existing Pahrump-Mead Transmission Line. One access option would cross over the mountain west of the plant site, two access options would extend all five

circuits around or across the southern toe of the mountain. One access option would extend one circuit across the mountain and four circuits across or around the toe of the mountain.

Development of the Primm Plant Site would require construction of a circuit to Mead Substation (Ivanpah-Mead Transmission Line) and one circuit to Table Mountain Substation (Ivanpah-Table Mountain Transmission Line). Four alternative routes were evaluated to interconnect the Ivanpah Energy Center to the two substations.

Selection of the No Action Alternative would result in a failure to develop new generating capacity in Southern Clark County. Under such circumstances, the region would continue to be reliant on existing and planned generation and the purpose and need for the Ivanpah Energy Center would not be met.

Alternatives and options that were evaluated in detail are summarized in Table 6-1.

Comparative Summary of Impacts

Geology and Soils

Impacts to geology and soils that would be related to construction and operation of the Ivanpah Energy Center would be similar and negligible, regardless of alternative plant site selected. Use of the Goodsprings Site would eliminate mining potential on approximately 42 acres; whereas use of the Primm Site would eliminate mining potential on 9 acres., Transmission line construction related to the Goodsprings Plant Site would cross 40,000 linear feet of mining claims (regardless of transmission line alternative); those associated with the Primm Plant Site would cross 54,000 to 56,000 linear feet of mining claims.

Erosion potential that would be associated with plant access option would only be associated with development of the Goodsprings Plant Site. Those access options that would cross the mountain west of the Goodsprings Plant Site (Options 1 and 4) would result in greater potential impacts than those that would cross south of the mountain (Options 2 and 3).

Mitigation measures that would be implemented to reduce the severity of erosion include the installation of appropriate drainage structures (i.e., gabions) and regrading and revegetation of disturbed areas. Those that could be taken to reduce impacts to mining operations include modifications to transmission line structure locations, spanning of mining areas, and negotiations with mining operators.

Impacts to geology, soils, and mining are expected to be less than significant, regardless of plant site alternative.

Groundwater and Surface Water

Ivanpah Energy Center (regardless of plant site location) would operate using a dry cooled system and refrigerated input air that would minimize process water requirements. Water that would be needed for plant operations would be acquired from gray water flows from the Southern Nevada Correctional Center.

Groundwater would only be required as a supplement to the use of gray water. A well that is located near the SNCC has been proposed for use by the project proponent, should gray water flows from the SNCC be curtailed. The use of refrigerated air technology and gray water

would reduce groundwater dependence, thus resulting in less than significant impacts to the resource.

Biological Resources

Construction and operation of the Ivanpah Energy Center at the Proposed Goodsprings Plant Site would result in significant impacts to approximately 115 acres of moderate density (Category B) desert tortoise habitat. Approximately 36 acres would be permanently affected during the life of the project; 79 acres would be temporarily affected. An additional 222 acres that are located in low density (Category C) desert tortoise habitat would be moderately impacted as a result of facilities construction and operation.

Construction and operation of the Ivanpah Energy Center at the Primm Plant Site (Primm Plant Site Alternative) would result in significant impacts to approximately 27 acres of moderate density (Category B) desert tortoise habitat. Less than one acre would be permanently affected; approximately 26 acres would be temporary affected. An additional 340 acres (including 40 acres of industrial land at the Primm plant site) of low density (Category C) desert tortoise habitat would be moderately impacted as a result of facilities construction and operation.

Mitigation measures that would be taken to reduce impacts to Category B density areas include 100 percent clearing, extensive monitoring during construction, and permanent fencing of all permanent project site lands (including the northern access road). Mitigation required for Category C density areas are less stringent than those of Category B, but include on-site monitoring and other protective measures during construction. Stipulations for Category B and Category C density areas are provided in Appendix E.

Construction and operation of the Proposed Goodsprings Plant Site would permanently impact *Penstemon spp*. habitat (primarily due to construction of the northern access road), which would result in moderate impacts to the species. Additional moderate impacts would result from temporary impacts to *Penstemon spp*. habitat that would be primarily attributable to access road construction, water supply pipeline installation, and transmission line construction. Transmission lines that would be associated with development and operation of the Primm Plant Site Alternative would temporarily impact *Penstemon spp*. habitat, thus resulting in a moderate impact to the species. The temporary impacts would be primarily due to transmission line construction. Permanent impacts to the species that would be related to the Primm Plant Site Alternative are not expected. Impacts to the species would be mitigated to the extent practicable (regardless of alternative selected) through avoidance, site restoration, and reseeding. Stipulations that are applicable to the species are provided in Appendix E.

Construction of transmission lines that are related to the Proposed Goodsprings Plant Site would cross approximately 13,000 linear feet of crucial Gambel's quail habitat and result in moderate temporary impacts to the species. Similar moderate impacts to the species would result from approximately 26,000 linear feet that would be crossed by Primm Plant Site Alternative transmission lines. Approximately 21,000 linear feet of crucial desert tortoise habitat would be crossed by transmission lines. Impacts to other species

of concern were considered to range from negligible to moderate, regardless of plant site alternative. Impacts to the species would be reduced by using existing roads along transmission line corridors, minimizing the access road construction (to the extent practicable), and scheduling to avoid construction during the nesting and desert bighorn sheep lambing seasons.

Potential impacts to other species of concern are expected to range from negligible to moderate, regardless of plant site alternative. The severity of impacts to other species of concern would be minimized through the use of existing access roads along transmission line corridors and minimizing construction of new access roads, to the extent practicable.

Cultural and Paleontology

Class I cultural and paleontological data indicate that several sites of potential interest are within the project area. Field investigations will be conducted as part of the project to identify potential impacts and mitigation measures associated with the project.

Table 6-1. Summary of Alternatives Retained for Further Consideration

Project Component	Proposed Goodsprings Plant Site	Primm Plant Site Alternative
IEC Plant Site Location Alternatives	Alternative E— Proposed Goodsprings Plant Site	Alternative F – Primm Plant Site (co-location with Reliant Bighorn)
Natural Gas Pipeline	Direct connection to plant site. No routing required.	3.2-mile-long pipeline from KRGT and 0.46 acre metering station.
Telecommunications Line	Installation along a 7,200-foot-long corridor from the KRGT Compressor Station to the plant.	Installation along the existing Sprint Communications line in use by Reliant. No routing required
Access Roads	Northern Access (County Road 53Y), 20-foot-wide, paved, 3-foot-wide shoulders.	Access available on paved road through the Bighorn facility.
	Southern Access (County Road 28, existing trail, and County Road 53Y). Trail bladed to 18-foot-width.	
Water Treatment Facility	Use of one of two 0.7-acre parcels north of Prison Road.	
Water Supply Pipeline Route	South from SNCC along the west side of the UPRR ROW to and within BLM-designated Utility Corridor and Ivanpah-Mead Transmission Line #2 corridor.	Parallel to east side of the UPRR ROW to the plant site.
		Parallel to east side of the UPRR ROW to (and within) the Ivanpah-Mead/Ivanpah-Table Mountain Transmission Line corridor.
Water Supply Pipeline Plant Site Access Options	Across the mountain	N/A
	Traversing the southern slope of the mountain, north of Desert Tortoise fence.	
	Parallel to existing trail, around the southern toe of the mountain	
Transmission Line Alternatives	Alternatives C and E retained for further consideration.	Ivanpah-Mead—Four Alternatives Retained Ivanpah-Table Mountain –Two Alternatives Retained

Project Component	Proposed Goodsprings Plant Site	Primm Plant Site Alternative
Transmission Line Plant Site Access Options	Five circuits across the mountain	N/A
	Five circuits traversing the southern toe of the mountain, north of Desert Tortoise Fence	
	Five circuits parallel to an existing trail, around the toe of the mountain.	
	One circuit across the mountain, four circuits traversing the toe of the mountain	
Structure Type Options	Gray-painted single-pole tubular steel	
	Coreten single-pole tubular steel	
No Action Alternative	No Action Alternative Retained	

Land Use and Zoning

The Ivanpah Energy Center, Proposed Goodsprings Plant Site would be constructed on BLM land. Approximately 30 acres would be permanently (during life of the project) used for the facility and an additional 10 acres would be used as a temporary laydown area. Construction of the Primm Plant Site would be on private land. An additional 0.7 acres of State of Nevada land would be used for the water treatment plant, regardless of plant site alternative. Permanent and temporary land use requirements for BLM lands total 336 acres for the Proposed Goodsprings Alternative and 327 acres for the Primm Plant Site Alternative.

The water treatment plant would be located on State of Nevada land that is zoned as rural open space. Construction of the plant would require a special use permit from Clark County.

Impacts to land use and zoning would be negligible, regardless of alternative selected. The Goodsprings Plant Site would be located on leased public land and would require a zoning change to permit heavy industrial use. The Goodsprings Plant Site also will require variances and waivers for township/range line avoidance, height requirements, off-site development, county road abandonment, noise limitations, landscaping, and setback from non-industrial use areas.

The Primm Plant Site would be located on private land that is partially zoned for heavy industrial use. Eighty-five acres of the original 166 acres that are leased by Reliant Energy for the Bighorn facility have been zoned M-2 (heavy industrial). Although a portion of the original 85 acres may be available for use by Ivanpah Energy Center at Primm, it is likely that additional lands on the original 166-acre tract will require rezoning for heavy industrial use.

Development of the Primm Plant Site would require variances and waivers for height requirements, off-site development, noise limitations, setback from non-industrial use areas, and landscaping.

The Primm Site is currently under lease by Reliant Energy from Primadonna Corporation. According to Reliant Energy (Greesom, 2002), the current lease allows an unspecified amount of additional electrical generation to be constructed on the leased lands; however, contractual arrangements between Reliant Energy and Diamond Generating Corporation would need to be negotiated.

Rangeland Management

Although impacts to rangeland are not expected to be significant, regardless of plant site alternative, those related to the Primm Plant Site Alternative would be slightly greater than those related to the Proposed Goodsprings Plant Site. Potential impacts associated with both alternatives include the potential introduction of noxious weeds; injury to, or loss of livestock during construction; damage to fences, gates, and cattle guards that could occur during construction; and reduced access to water and feed supplies during construction. Mitigation measures that are applicable to reduce impacts to rangelands and grazing are provided in Appendix E.

Recreation

Impacts to recreation are not expected to be significant, regardless of plant site, transmission line route, or water supply pipeline route selected. However, they would be slightly greater for the Primm Site Alternative because transmission line construction through recreation-use lands would be more extensive than would be needed to support development and operation of the Proposed Goodsprings Alternative. Regardless of alternative selected, potential impacts related to off-road events and casual users could be reduced by appropriate scheduling and the identification of work site locations.

Transportation

Construction of the Goodsprings Plant Site could result in greater impacts to highway safety than that of the Primm Plant Site, primarily because plant site construction and operation would affect traffic on SR 161. However, due largely to the inclusion of the temporary (south) access road, the level of impacts that would be associated with the Proposed Goodsprings Alternative are not expected to be significant.

Hazardous Materials

Ivanpah Energy Center (regardless of plant site location) would be constructed and operated in a manner that would avoid the release of hazardous and non-hazardous materials. The project proponent has agreed to use aqueous ammonia (concentrations of less than 20 percent), rather than hydrous ammonia. Therefore, impacts associated with hazardous or non-hazardous materials are not expected to be significant, regardless of alternative selected.

Visual Resources

Construction and operation of either the Goodsprings or the Primm Plant Site are expected to result in weak to moderate visual impacts. The Goodsprings plant site would be screened from most views by intervening topography; the Primm plant site would be partially screened by the Reliant Bighorn Generating Facility. Slightly greater visual impacts would be associated with Goodsprings Plant Site Transmission Line Access Options 1 or 4 than would result from Options 2 or 3 because land disturbance and structures on the mountain west of the plant site would be more readily visible. Potential impacts associated with new transmission lines would be mitigated through the use of gray-painted structures and non-specular conductor and (to the extent practicable) by paralleling existing transmission lines and structures.

Climate and Air Quality

Construction at the Proposed Goodsprings Site or the Primm Site would generate similar levels of airborne particulates during site clearance and road construction. However, since more site preparation and access road grading would be needed for the Goodsprings Plant Site than would be needed for the Primm Plant Site Alternative, related temporary impacts that would be associated with the Goodsprings Plant Site would be greater than those associated with the Primm Site Alternative. Impacts to air quality due to plant operations are not expected to be significant, regardless of plant site selected.

Noise

Clark County noise standards are not expected to be violated, regardless of plant site selected and impacts to area residents are expected to be less than significant. However, due to the proximity of the site to sensitive receptors (2.3 miles), it is likely that temporary noise impacts related to construction of the Proposed Goodsprings Plant Site would be slightly greater than those related to the Primm Plant Site Alternative.

Socioeconomics/Environmental Justice

Construction and operation of the Ivanpah Energy Center would result in similar negligible impacts to area residents and Clark County, regardless of plant site location. Environmental Justice issues are not present at either alternative or their auxiliary components.

Land disturbance acreages that are associated with the Goodsprings and Primm plant site alternatives are shown on Tables 6-2 and 6-3, respectively.

Transmission Line Engineering and Cost Considerations

An engineering analysis was provided by Electrical Consultants, Inc. (ECI) (Broveak, 2002) to compare reliability, constructability, cost, and maintenance factors that are related to transmission lines required to serve the Proposed Goodsprings Plant Site and those required to serve the Primm Site Alternative. Results of the analysis are as follows:

Reliability

Valley Electric Association's (VEA) existing Pahrump-Mead 230 kV transmission line does experience a few storm-related faults annually. According to fault locating capabilities of solid-state relaying, the majority of these weather-related outages occur within the McCullough Mountain Range, east of both plant site options. Consequently, the likelihood of a transmission outage requiring a short-term curtailment or transfer-tripping of generation to maintain transmission system reliability is to be expected. Given that the Goodsprings Plant Site's proximity to the existing Pahrump-Mead line corridor facilitates easy interconnection into VEA's Pahrump-Mead Line, transfer-tripping and curtailment of generation will be via direct wired electrical interconnections. Conversely, the Primm Plant Site Alternative would rely heavily on communications assisted schemes for generation shedding. Therefore, there is justification for the Goodsprings Plant Site as a more reliable plant location.

Furthermore, the Proposed Goodsprings Plant Site would interconnect with the transmission grid through three 230 kV lines (circuits) on two separate transmission structures, whereas the Primm Plant Site Alternative would interconnect to the transmission grid through two lines (circuits) on the same structure. Consequently, the possibility of a single contingency resulting in an outage on all interconnected lines is substantially higher for the Primm Plant Site Alternative than that of the Goodsprings Alternative. Although uncommon, a single lightning strike or structure failure on the double circuit line interconnecting into the Primm Plant Site would result in complete loss of the 500 MW generating output capability of the Ivanpah Energy Center.

Constructability

Construction of the Ivanpah Energy Center at the Primm Plant Site would be less difficult than that of the Goodsprings Plant Site, primarily due to the presence of existing access roads.

Essentially all transmission lines that would be required to support both plant site locations follow previously established transmission corridors. Therefore, constructability issues associated with the transmission lines are simply a discussion of line lengths. Upon review of the total line lengths associated with each option, ECI determined that transmission lines associated with the Goodsprings Plant Site would be marginally more constructible.

Construction Cost

From a construction cost standpoint, preliminary estimates indicate construction costs for a single-circuit 230 kV, bundled 954 kCM ACSR conductor with OPGW shield wire would be approximately $320,000 per mile and a double-circuit line would cost approximately $425,000 per mile. This yields an approximate cost for transmission facilities associated with the Goodsprings Plant Site of $16,097,500 and approximately $18,109,500 for the Primm Plant Site. Consequently, as a direct result of the additional line miles associated with the Primm Site, the Goodsprings Plant Site is a more cost effective option.

Maintenance Considerations

From a line maintenance perspective, the Proposed Goodsprings Plant Site is somewhat better due to the fact that all new lines would be within 1 mile of existing VEA line corridors. Construction of the Ivanpah Energy Center at the Primm Site would introduce approximately 7.9 miles of new VEA line corridors. However, regardless of plant site location, the use of steel pole construction would minimize maintenance requirements.

Table 6-2 Areas of Disturbance by Project Component – Proposed Goodsprings Plant Site

Goodsprings Site – includes Option 2 across toe of mountain and line to Table Mountain						
	BLM ROW	**Land Disturbance Within BLM ROW**		**Land Disturbance Outside of BLM ROW**		**Private and State Lands**
		Permanent	**Temporary**	**Permanent**	**Temporary**	
Ivanpah Energy Center						
Plant Site (N-75493)	30.0	30.0				
Temporary Laydown Area (N-75493)	10.0		10.0			
Natural Gas Supply Pipeline (N-75471)	Negligible	Negligible	Negligible			
Telecommunications Line (N-75895) (1)	1.7		0.8			
Access Roads (N-75493)						
Northern Access Road (County Road 53Y) (2)				2.7		
Southern Access Road (3)					2.6	
Water Treatment Plant (no BLM permit required)	State of Nevada Land					0.7
Water Supply Pipeline (N-75475)						
Parallel to UPRR ROW and Co-located with Transmission Corridor (~57,560 linear ft)	13.2 (4)		52.9 (5)			
Ivanpah-Mead #2, Ivanpah-Table Mountain #1 & #2, and Pahrump-Mead Interconnections (N-75471 and N-75472)						
Approx. Line Length (~251,000 linear ft)						
Pole Sites (380)		<0.1				
Pole Work Areas (100x200 each)			174.5			
P&T Sites			2.8 (6)		27.6 (7)	
New Access Roads		4.8 (8)				
Spur Roads		4.1 (9)			5.2 (10)	
OPGW	69.2 (11)					
Temp. Laydown Areas (total)					18.0	
Total Proposed Goodsprings Site		**38.9**	**241.0**	**2.7**	**53.4**	**0.7**

(1) Total length - 7,200 linear ft -- 10 ft wide permanent ROW, 25 ft temporary disturbance along 1,400 linear feet.
(2) 7,500 linear ft – increase from 10 ft wide to 26 ft wide, pave 20 ft. width.
(3) 14,000 linear ft – increase from 10 ft side to 18 ft wide.
(4) 10 ft wide permanent ROW, partially within project transmission line corridors,
(5) 40 ft wide temporary disturbance
(6) 4 sites within ROW, (100x300 each)
(7) 40 sites outside of ROW, (100x300 each)
(8) 5,000 linear feet x 18 ft, from Table Mountain Sub. to Mead Sub. (2.1 ac), plus 6,500 linear feet x 18 ft, across toe of mountain (2.7 ac)
(9) 10,000 linear feet (spur roads) x 18 ft (4.1 ac)
(10) 12,500 linear feet (spur roads) x 18 ft from Table Mountain Sub. to Mead Sub. (5.2 ac)
(11) OPGW = 12 ft wide throughout length of ROW
Note: Linear feet and acreages among transmission line alternatives and plant access options differ slightly.

Table 6-3 Areas of Disturbance by Project Component – Primm Plant Site Alternative

Primm Site – Includes to Table Mountain Circuit						
	BLM ROW	**Land Disturbance Within BLM ROW**		**Land Disturbance Outside of BLM ROW**		**Private and State Lands**
		Permanent	**Temporary**	**Permanent**	**Temporary**	
Ivanpah Energy Center						
Plant Site (N-75493)	Private Industrial Land					30.0
Temporary Laydown Area (N-75493)	Private Industrial Land					10.0
Natural Gas Supply Pipeline (N-75471)	4.4 (1)	0.5 (2)	19.4 (3)			
Telecommunications Line (N-75895)	None required					
Access Roads (N-75493)	None required					
Water Treatment Plant (no BLM permit required)	State of Nevada Land					0.7
Water Supply Pipeline (N-75475)						
Parallel to UPRR ROW (~57,800 linear ft)	13.3 (4)		53.1 (5)			
Ivanpah-Mead and Ivanpah-Table Mountain Circuits (N-75471 and N-75472)						
Approx. Line Length (~285,900 linear ft)						
Pole Sites (410)		<0.1				
Pole Work Areas (100x200 each)			188.3			
P&T Sites			3.4(6)		30.3(7)	
New Access Roads		4.2(8)				
Spur Roads		4.1(9)			5.2(10)	
OPGW	78.8(11)					
Temp. Laydown Areas (total)					18.0	
Total Primm Site Alternative		**8.8**	**264.2**	**- 0 -**	**53.5**	**40.7**

(1) 0.5 ac metering station plus 3.9 ac permanent pipeline ROW (10 ft width)
(2) 100 x 200 ft metering station
(3) 16,900 linear ft pipeline, 50 ft wide temporary disturbance
(4) 10 ft wide permanent ROW
(5) 40 ft wide temporary disturbance (an alternative using transmission line corridors would result in 66 acres of disturbance).
(6) 5 sites within ROW, (100x300 each)
(7) 44 sites outside of ROW, (100x300 each)
(8) 5,000 linear feet x 18 ft, from Table Mountain Sub. to Mead Sub.(2.1 ac), plus 5,000 linear feet x 18 ft from IEC to the north (2.1 ac)
(9) 10,000 linear ft (spur roads) x 18 ft (4.1 ac)
(10) 12,500 linear feet x 18 ft from Table Mountain Sub. to Mead Sub. (5.2 ac)
(11) OPGW = 12 ft wide throughout length of ROW
Note: Linear feet and acreages among transmission line and water supply pipeline alternatives options differ slightly.

6.1 SIGNIFICANT UNAVOIDABLE ADVERSE IMPACTS

Construction and operation of the Ivanpah Energy Center would result in significant impacts to the desert tortoise. Construction of the Proposed Goodsprings Plant Site, the telecommunications line, access roads, water supply pipeline, and transmission lines would result in the permanent loss of approximately 36 acres of Category B desert tortoise density lands. An additional 79 acres would be significantly affected during construction and prior to completion of restoration practices.

Construction and operation of the Ivanpah Energy Center at the Primm Plant Site would result in significant impacts due to the permanent loss of less than one acre of Category B desert tortoise density lands. Additional significant impacts would result from temporary impacts to approximately 27 acres of Category B desert tortoise density lands.

The decision to identify impacts within Category B habitat as "significant" was made based on species density and a higher potential for project actions to affect greater numbers of desert tortoise than would be affected by actions in lower density areas. Species density within the category typically exceed 45 per square mile, whereas those within Category C density areas are below 45 per square mile. Category B lands, as designated by the BLM (1997), include the area west of I-15 from the vicinity of Jean to the southern limit of the Desert Tortoise Translocation Area and lands east and west of the interstate north of Jean.

Results of biological investigations that were carried out for the Ivanpah Energy Center EIS confirm relatively high densities of the species to be present along the northern and southern access roads to the plant site, land surrounding the plant site, and along transmission line corridors west of I-15 as discussed in Section 5.1.3. Additional information, contained in the Draft Biological Assessment (refer to Appendix F) indicates that moderate (45 – 90 per square mile) to very high (140+ per square mile) densities were found to be present within all but one area west of I-15. Densities east of the interstate, including Eldorado Valley, ranged from very low (0 – 10 per square mile) to low (10 – 45 per square mile) in all but one area.

Project activities within moderate to high density desert tortoise habitat were considered to result in significant impacts to the species because actions within those areas (Category B) are more likely to directly or indirectly affect greater numbers of the species than similar actions within very low to low density habitat. The range of impacts include incidental take during construction or operation due to crushing or similar direct action, habitat fragmentation, introduction of noxious or other undesirable plant species, soil compaction and similar habitat degradation, and the potential for increased public access to area lands.

Direct long-term habitat loss associated with construction and operation of the Ivanpah Energy Center and north access road at the Goodsprings Plant Site and potential increased public access to the

area south of the plant site represent significant unavoidable impacts that cannot mitigated. Short-term and long-term unavoidable impacts that can be (at least partially) mitigated include construction of the south access road, land disturbance due to water supply pipeline and telecommunications line installation, and transmission line installation. The range of mitigation measures include site restoration and revegetation and noxious weed controls.

Mitigation measures that would be used to minimize impacts to the species are provided in Appendix E.

6.2 CUMULATIVE IMPACTS

The National Environmental Policy Act requires the identification and consideration of incremental impacts that are related to the proposed action when added to other past, present and reasonably foreseeable actions (40 CFR 1508.7). Consideration of such impacts is necessarily broad and includes on-site and off-site public and private actions that would be directly or indirectly related to the proposed action.

Cumulative impacts that would be associated with the Ivanpah Energy Center were limited to the Ivanpah Valley and Eldorado Valley of southern Clark County, Nevada. Those activities include previous, present, and probable future developments within the two valleys. Short-term impacts are associated with facilities construction; long-term impacts relate to the life of the project (at least 30 years).

6.2.1 Current Setting

Ivanpah and Eldorado valleys have been previously impacted by a variety of activities ranging from the construction and continued use of major highways and secondary roads, unimproved roads and trails, pipelines, the Union Pacific Railroad, casinos and retail businesses, transmission lines and substations, and other facilities developed around Jean and Primm. Development within the area has resulted in the loss of natural resources and the transition of both valleys from their original undisturbed natural setting to one that, in many locations, represents an industrial or commercial setting. Similar changes have taken place in limited areas of the McCullough Range where roads and trails provide access through narrow passes that also are crossed by high voltage transmission lines. As described in Chapter 4, nearly all areas that would be affected by development and operation of the IEC facility have been previously impacted by development.

6.2.2 Reasonable and Foreseeable Future Actions

Ivanpah Valley has become a focus for new development in the southern Clark County area. Its proximity to the City of Las Vegas and the Nevada/California state line, the availability of land, and the availability of I-15 have contributed to the development of retail and casino operations in Jean and Primm. Conversely, development within the Eldorado Valley is limited by the City of Boulder City as a result of a 1994 Interlocal Agreement with Clark County (1994). Development within the valley has been limited to high voltage transmission lines, substations, the Reliant-Sempra El Dorado Power Plant, and mining activities.

Reasonable and foreseeable future actions that could contribute to cumulative impacts within Ivanpah Valley and Eldorado

Valley that are related to the proposed action include:

Ivanpah Valley

- Clark County Conservation of Public Lands and Natural Resources Act of 2002
- Kern River Gas Transmission Expansion Project
- Sempra Energy Natural Gas Supply Pipeline Project
- Table Mountain Wind Energy Project
- Ivanpah Valley Airport Development
- Las Vegas Valley Water District Pipeline
- Widening of I-15 and Sandy Valley Road
- Las Vegas – Southern California Maglev System
- Reliant Bighorn Generating Facility
- AT&T Fiber-optic Line

Eldorado Valley

- Widening of U.S. 95
- City of Boulder City Bypass

Clark County Conservation of Public Lands and Natural Resources Act of 2002

Passage of the Clark County Conservation of Public Lands and Natural Resources Act of 2002 by the United States Senate (Senate Bill 2612) includes measures that are applicable to the Ivanpah Valley. The bill addresses the management of public lands along the Interstate 15 corridor from southern Las Vegas to the Nevada/ California State Line and includes the establishment of a 2,640-foot wide corridor "… between the Las Vegas Valley and the proposed Ivanpah Airport for the placement, on a nonexclusive basis, of utilities and transportation." Lands that would be transferred to Clark County for development of the Ivanpah Airport can be subsequently sold, leased, or otherwise conveyed (subject to limitations) by Clark County to a third party. The bill signed into law by President George W. Bush during November 2002.

The location of the proposed Ivanpah Airport and surrounding lands that have been designated as a noise compatibility area for the airport are shown on Figure 6-1. The location of the 2,640-foot-wide utility corridor has not been determined, and therefore, is not shown on the map. Although plans have not been finalized regarding airport development, it is assumed that airport facilities will occupy essentially all of the 6,000 designated acres. Lands that have been designated for noise compatibility uses could remain in their current use, which includes grazing, or could be developed for business, industrial, warehousing, or similar noise compatible use. The Proposed Goodsprings Plant Site is not within the designated noise compatibility area, whereas the Primm Plant Site is within the compatible use area.

Kern River Gas Transmission Expansion Project

The Kern River Gas Transmission pipeline is west of I-15, in the western portion of Ivanpah Valley. Information provided by Tim Powell of Williams Companies (Powell 2002) indicates that the project is on schedule; construction along some

segments of the pipeline corridor began during the fall 2002. A Final Environmental Impact Statement has been prepared and issued by the Federal Energy Regulatory Commission (FERC) and the California State Lands Commission (CSLC).

The KRGT expansion project would include construction and operation of about 635 miles of 36-inch-diameter pipeline, 82 miles of 42-inch-diameter pipeline, less than one mile of 12-inch-diameter pipeline, three new compressor stations, expansion of six existing compressor stations, and modifications to five existing meter stations. System improvements in the Goodsprings area includes proposed modifications to an existing 15,000 horsepower gas turbine compressor and the installation of two new compressors, each rated at 15,000 horsepower. An additional 36-inch-diameter pipeline also would be installed in the Goodsprings area. Based on information provided in the DEIS (FERC and CSLC, 2002), improvements and expansion of the system in the Goodsprings area would not result in significant environmental impacts. Operation of two new 15,000 horsepower compressors are expected to result in the following emissions (Table 6-4):

Table 6-4 KRGT Emissions Associated With Two New 15,000 Hp Compressors

Unit	NO_x		CO		VOC		SO_2		PM_{10}	
	Lb/hr	Tpy	Lb/hr	Tpy	Lb/hr	Tpy	Lb/hr	Tpy	Lb/hr	Tpy
Additional Turbines	19.45	85.20	4.50	19.72	6.78	29.71	0.66	2.91	1.30	5.65
Existing Turbines	---	45.84	---	10.37	---	13.87	---	1.37	---	2.72
Total	---	131.04	---	30.09	---	43.58	---	4.28	---	8.37
Net Increase	---	85.20	---	19.72	---	29.71	---	2.91	---	5.65

NO_x nitrogen oxides (includes nitric oxide and nitrogen dioxide)
CO carbon monoxide
VOC volatile organic compounds
SO_2 sulfur dioxide
PM_{10} particulate matter, less than 10 microns in diameter
lb/hr pounds per hour
tpy tons per year

Potential noise impacts at the closest sensitive receptor to the compressor facility (approximately 2 miles to the northwest) are expected to average (based on 24 hour weighted averages) 35 dB-A; existing day-night adjusted averages at the sensitive receptor, as stated in the DEIS, are 32.4 dB-A.

Sempra Energy Natural Gas Supply Pipeline Project

Sempra Energy is planning to construct a new natural gas supply pipeline from the KRGT pipeline, in the vicinity of the Goodsprings Compressor Station to Eldorado Valley. Preliminary information pertaining to the intended route of the line indicates that it would follow the approximate route that is proposed for the proposed Ivanph-Mead Transmission Line through Ivanpah Valley and the McCullough Range.

Construction of the line would result in temporary disturbance along a new ROW that would parallel existing roads, trails, and transmission lines.

Table Mountain Wind Energy Project

The Bureau of Land Management (2002) has issued a Draft Environmental Impact Statement for the development and operation of the wind energy facility on Table Mountain. The proposed action would be located on approximately 4,500 acres, west of the Ivanpah Energy Center, and would include an array of 153 wind turbine generators ranging in tower height from 140 to 290 feet. A 34.5 kV interconnection network would be installed using overhead structures; power generated from the facility would be delivered to the proposed Table Mountain Substation for interconnection to the VEA grid through interconnections to the IEC Substation.

Results of the DEIS indicate that significant or potentially significant impacts to wildlife (including bighorn sheep) and visual resources would be attributable to the project.

Ivanpah Valley Airport Development

The proposed Ivanpah Valley Airport would be located on a 6,000-acre tract east of I-15 and west of the UPRR, between Jean and Primm. The area is currently undeveloped and under BLM administration; land for the facility would be made available through a land disposal action. Plans for the airport have not been developed and potential impacts cannot be fully quantified. However, if the facility were to be developed, it is likely to be similar in size and passenger/cargo handling capabilities as McCarran Airport.

Airport operations would contribute to the degradation of air quality and increased noise levels within the valley as a result of aircraft operations and induced automobile and truck traffic. Land use impacts would be associated with the loss of as much as 6,000 acres of relatively undisturbed desert that is primarily used for recreational events. Visual impacts would be associated new facilities and lighting.

Las Vegas Valley Water District Pipeline

The Las Vegas Valley Water District has proposed construction and operation of a water supply pipeline from the existing 2420 Zone Bermuda Reservoir (located in southern Las Vegas) to Jean, Primm, the Southern Nevada Correctional Center, and the proposed Ivanpah Valley Airport. The pipeline also would provide water to other

users along the I-15 corridor and within the valley in general. The project includes more than 30 miles of large-diameter pipeline, three pump stations, two reservoirs, and associated facilities such as access roads, electric power distribution lines, and telemetry control structures (BLM, 2002).

Although direct impacts associated with the pipeline are likely to be minimal, the availability of a reliable water source in Ivanpah Valley would likely result in increased development within the valley and secondary impacts as a result of such development.

Widening of I-15 and Sandy Valley Road

Nevada Department of Transportation is in the process of widening I-15 between the Nevada/California state line to the vicinity of Sloan. Widening is taking place in the median, leaving the existing two northbound and two southbound lanes in place for continued use. Clark County has determined that improvements to Sandy Valley Road are required to meet increasing growth in the area. Improvements to the existing road include an increase in highway ROW to a 200-foot-wide corridor.

Improvements associated with I-15 and Sandy Valley Road are likely to include additional noise levels due to higher vehicle speeds. However, due to the overall lack of sensitive receptors in the Goodsprings area, impacts to area residents are likely to be less than significant.

Las Vegas – Southern California Maglev System

The California Super Speed Train Commission and the American Magline Group have issued a project definition document describing a 300-mile per hour magnetic levitation (Maglev) system linking Las Vegas and southern California (BLM, 2002). The proposed alignment would be located almost entirely within the I-15 corridor and on some BLM lands within southern Clark County, including Ivanpah Valley. The trains would operate at a level of approximately 376 trains per week, 20 hours per day. Intermediate stops would include a commuter link between Las Vegas and Primm. Construction is scheduled to begin in 2003 and be completed by 2006.

Operation of the proposed maglev system would likely result in visual impacts within Ivanpah Valley as well land use impacts associated with induced growth in the vicinity of Primm. Potential beneficial economic impacts to the Goodsprings community could result from induced development within the valley. Adverse impacts to the community are likely to be minimal.

Reliant Bighorn Generating Facility

The Reliant Bighorn Generating facility is under construction, with completion scheduled for fall 2003. The generating facility would be much like the Ivanpah Energy Center and include two combined-cycle gas-fired turbine generators with a nominal output of 500 MW. As a combined cycle facility, exhaust heat would be routed to a heat recovery system to provide steam for a single steam-turbine generator. A new 230 kV transmission line from the facility was constructed to the Nevada Power Company Arden Substation. A portion of the Bighorn to Arden Transmission Line corridor parallels that which would be used by the Ivanpah Energy Center project. Reliant is

constructing a natural gas supply pipeline from KRGT to the plant site, a distance of approximately 3 miles.

An Environmental Assessment, completed for the project during the Fall 2001 indicated that impacts associated with its construction or operation would be minimal, and the BLM issued a Finding of No Significant Impacts for the project.

AT&T Fiber-optic Line

Preliminary information from AT&T indicates that an existing fiber-optic telecommunications line would be relocated from the east side of I-15 to the west side of the highway. Although the specific alignment has not been determined, the relocation would accommodate development of the proposed Ivanpah Valley Airport.

Construction of the relocated fiber-optic line is likely to result in temporary impacts to vegetation along the west side of I-15.

Widening of U.S. 95 (Eldorado Valley)

Nevada Department of Transportation is planning to widen U.S. 95 through Eldorado Valley. The widening would extend from U.S. 93 (Boulder Highway), near Railroad Pass, to the vicinity of Searchlight. Roadway width would be increased from two lanes to four lanes.

Although U.S. 95 crosses the proposed Ivanpah-Mead Transmission Line near the City of Boulder City, potential impacts associated with road improvements at the crossing location are not anticipated. However, specific design information would be required to determine structure locations and designs at the crossing location. Impacts related to highway improvements are likely to be limited to increased noise levels and land use changes. Most of the area that is crossed by the highway is under the jurisdiction of the City of Boulder City which prohibits commercial and residential development in the area.

City of Boulder City Bypass (Eldorado Valley)

Nevada Department of Transportation is planning to construct a new highway to bypass the City of Boulder City. Three construction (action) alternatives have been identified as part of a Draft Environmental Impact Statement, all of which would be located north of the proposed Ivanpah-Mead Transmission Line.

The new highway is likely to result in impacts to existing habitat and would create visual and noise impacts in the area. Most of the area that is crossed by the highway is under the jurisdiction of the City of Boulder City which prohibits commercial and residential development in the area.

6.2.3 Potential Cumulative Impacts by Resource Category

Cumulative Impacts to Geology and Minerals, Soils, Seismicity, and Mining

Construction and operation of the Ivanpah Valley Airport is likely to result in greater impacts to the availability of minerals and mining activities within the area than all other projects combined (including the Ivanpah Energy Center project). Minerals extraction and mining would be essentially precluded within a 6,000-acre area during the foreseeable future. Incremental impacts

to geology and minerals, soils, seismicity, and mining that would result from construction of the Ivanpah Energy Center at Goodsprings or at Primm would eliminate mining within permanently disturbed areas.

Ivanpah Energy Center would use approximately 3,300 million British Thermal Units per hour (Btu/hr) during full operating conditions. Following completion of expansion plans (scheduled for 2003), Kern River Gas Transmission Company transport capacity is expected to double its present capacity to total more than 1,700,000 dekatherms per day (70,830 dekatherms per hour). Therefore, maximum natural gas consumption at the Ivanpah Energy Center facility would total 4.7 percent of KRGT capacity.

Cumulative Impacts to Groundwater and Surface Water Resources

Development of the Ivanpah Energy Center (regardless of plant site location) would not affect surface waters, and therefore, not contribute to cumulative impacts to the resource. Groundwater availability is an issue in Ivanpah Valley, as well as many other areas of southern Nevada. Although development of the Ivanpah Energy Center (regardless of plant site location) would contribute to the cumulative effects of groundwater withdrawal and groundwater availability, the use of gray water from the SNCC and the application of a dry cooled, refrigerated air system would greatly reduce potential impacts to the resource. Requirements for groundwater would be further reduced by construction and operation of the proposed Las Vegas Valley Water District Pipeline which would provide water to existing and future development within Ivanpah Valley.

Cumulative Impacts to Biology

Construction and operation of the Ivanpah Energy Center would contribute to the loss of vegetation and wildlife resources within the Ivanpah Valley and Eldorado Valley.

Development within Ivanpah Valley has resulted in the loss of wildlife habitat due to construction, increased human presence, and recreational activities. Grazing, off-road recreational activities; and construction of transmission lines, facilities, and roads east of I-15 have contributed to the cumulative degradation of biological resources in the area. Project area lands west of I-15 have been less affected; however, the area has been previously impacted by construction of transmission lines, the KRGT pipeline and compressor station, and mining and other activities. Planned future actions, such as those that may occur as a result of the Clark County Conservation of Public Lands and Natural Resources Act of 2002, development of the Ivanpah Airport, KRGT expansion, are likely to result in far greater cumulative impacts to native species and species of concern than would result from the Ivanpah Energy Center, regardless of plant site location. Future development within the area is likely to transpose the valley from its present rural/urban mixture to a primarily urban setting. As urbanization occurs, native wildlife will be displaced by species that are more tolerant of urbanization.

Cumulative Impacts to Cultural and Paleontological Resources

The compendium of scientific knowledge of cultural and paleontological resources within the Ivanpah Valley is expanded as part of research conducted for essentially all projects within the area. Although

lands investigated as part of the Ivanpah Energy Center Project represent an incrementally small part of previously investigated areas or those that would be investigated as part of other foreseeable projects, they nevertheless, contribute to the overall database of knowledge in the area. Therefore, cumulative effects associated with the proposed action are believed to represent a negligible beneficial impact.

Cumulative Impacts to Land Use and Zoning

Ivanpah Valley has undergone and will continue to undergo extensive changes in land use patterns and zoning. Prior land use changes have resulted from construction and operation of the UPRR, highways and roadways, development within Goodsprings, Jean, and Primm. Additional land use and zoning changes are expected to occur as a direct result of the Table Mountain Wind Energy Project, the Ivanpah Valley Airport; indirect changes are expected to occur as a result of water availability and transportation improvements related to the Las Vegas Valley Water District pipeline, widening of I-15, and the Maglev Project.

Although the far-reaching ramifications of the passage of the Clark County Conservation of Public Lands and Natural Resources Act of 2002 cannot be fully determined, it provides an opportunity to substantially increase development along the I-15 corridor in Ivanpah Valley. As controls over land use change over time, it is possible that lands that are presently undeveloped will be used for commercial development. Cumulative impacts to land use patterns and zoning are likely to be far-reaching and significant.

Land use and zoning changes attributable to the Ivanpah Energy Center are expected to represent a negligible incremental impact, when compared to previous and reasonably foreseeable changes.

Cumulative Impacts to Range Management

The Jean Lake Grazing Allotment (Allotment #15416) has been previously impacted by construction and maintenance of numerous transmission lines through the area and ongoing construction of the Reliant Bighorn to Arden Substation Transmission Line. Potential cumulative impacts associated with the proposed action, in combination with the proposed Sempra Energy Natural Gas Supply Pipeline Project are expected to represent largely temporary negligible cumulative impacts to the resource.

Implementation of the Clark County Conservation of Public Lands and Natural Resources Act of 2002 could result in far reaching impacts to BLM grazing lands east of I-15. A large portion of designated grazing lands lies within the designated noise compatibility areas which could become developed for business or industrial use in future years. If development were to occur, livestock production within the area could become less than viable.

Cumulative Impacts to Recreation

Recreation activities in the Ivanpah Valley are likely to be significantly impacted by development of the Ivanpah Valley Airport. Additional cumulative impacts to recreation could occur as a result of implementation of the Clark County Conservation of Public Lands and Natural Resources Act of 2002. Although ramifications of the legislation cannot be fully

determined, development within the noise compatibility area could significantly impact recreational activities within the area. Although construction and operation of the Ivanpah Energy Center (regardless of plant site location) is likely to have little impact on recreation in the area, cumulative effects of other actions are likely to be significant.

Cumulative Impacts to Transportation

Simultaneous development of the Table Mountain Wind Energy Project and the Ivanpah Energy Center could cumulatively result in moderate impacts to traffic along SR 161. The use of the southern access road to the plant site and scheduling of construction activities at both locations could reduce the extent of cumulative impacts to traffic.

Impacts to traffic resulting from construction of several proposed projects in the area, particularly if construction schedules coincide, and the additional truck traffic from the haul road across SR 161 from the plant access road.

Additional development within Ivanpah Valley that would be related to development and operation of Ivanpah Airport, the Las Vegas – Southern California Maglev System, and induced development related to increased water availability due to the proposed Las Vegas Water District Pipeline would create the need for additional roads and highways. As development within the valley increases, existing highways, such as SR 161 and Sandy Valley Road would become more congested and improvements would be needed. Although development and operation of the Ivanpah Energy (regardless of plant site location) would contribute to transportation impacts, those related to increased development within the area would be significantly greater.

Cumulative Impacts Related to Hazardous Materials

Project-related impacts associated with hazardous materials are not anticipated. However, development of the Ivanpah Airport and potential induced development related to increased water availability related to the Las Vegas Valley Water District Pipeline and land use changes related to passage of the Clark County Conservation of Public Lands and Natural Resources Act of 2002 could increase the potential for a release of hazardous materials within the area. Due to regulations governing the transportation, storage, and disposal of hazardous materials, cumulative impacts related to hazardous materials are not expected to be significant.

Cumulative Impacts to Public Services

Project-related impacts to public services are not anticipated. However, the need for additional public services is likely to increase as development within the Ivanpah Valley continues to increase. Future actions that are likely to affect the need for public services include induced development as a result of increased water availability (Las Vegas Valley Water District Pipeline) and land use changes related to the Clark County Conservation of Public Lands and Natural Resources Act of 2002.

Cumulative Impacts to Visual Resources

Development of the Ivanpah Energy Center (regardless of plant site location) would not result in significant visual

impacts within the area. However, increased development within the Ivanpah Valley would be expected as a result of induced development related to increased water availability due to the proposed Las Vegas Valley Water District Pipeline. Other future actions would result in and land use changes that would be attributable to implementation of the Clark County Conservation of Public Lands and Natural Resources Act of 2002 and development of the proposed Ivanpah Airport. In combination, the cumulative effects of such future actions could result in significant visual impacts within the area.

Construction and operation of project-related transmission lines in Ivanpah Valley and Eldorado Valley would result in minimal visual impacts at the I-15 and US 95 crossings. However, as development increases along the I-15 corridor and traffic increases along US 95 in Eldorado Valley, the potential for significant visual impacts increases.

Cumulative Impacts to Air Quality

Ivanpah Energy Center would be designed to be at, or below, national and local air quality standards. Consequently, emissions would result in a negligible impact to air quality in the Ivanpah Valley. Air quality modeling was carried out to determine the cumulative effects of Proposed Ivanpah Energy Center operations at the Goodsprings Plant Site, aircraft operations at the proposed Ivanpah Valley Airport, and operations of the Reliant Energy Bighorn Facility. Modeling results were provided to the Clark County Department of Air Quality Management (DAQM) and are discussed in Section 5.1.12.

Concerns regarding cumulative impacts to air quality resulting from other proposed projects.

Emissions from the proposed airport were modeled as two sources at two points within the airport property. The sources were described as two vertical columns, each about 600 meters tall and about 1.7 miles apart to simulate the vertical range of aircraft while landing and taking off. The columns were only about 5 meters wide and did not fully simulate the horizontal extent of the emissions; as a result, emissions from the airport were over predicted. The analysis also assumed that all NOx emissions would convert entirely to NO_2, although it is unlikely that full conversion would occur before the point of maximum impact.

Additional modeling runs were made for NO_2 and PM_{10} that included existing and proposed sources in the Ivanpah Valley, as provided in the air quality permit application to the DAQM. Results of the modeling indicate the maximum NO_2 (annual) impact from the sources is 31.6 $\mu g/m^3$, which exceeds the allowable increment of 25 $\mu g/m^3$. This impact, was determined to be almost entirely (more than 99 percent) from estimated airport emissions. As stated previously, the heavy concentration of all airport emissions at two points, and the assumed full conversion of NOx to NO_2 would tend to greatly over predict actual impacts from airport sources of NOx. The maximum contribution from the project (based on the Goodsprings Plant Site location), within locations where levels were 20 $\mu g/m^3$ or greater was 0.1 $\mu g/m^3$. Therefore, project contributions to the cumulative air emissions were considered to represent a negligible impact.

Analyses of maximum impacts for average 24-hour and average annual PM_{10} emissions were determined to be 16.7 and 4.2 $\mu g/m^3$, respectively, which are well below allowable increments. For the analysis, it was assumed that the Ivanpah Energy Center (Goodsprings Plant Site location) contributed the entire amount of the impact. As stated in Section 5.1.12 and shown in Table 5-21, calculated annual NO_2 impacts are just 32 percent of the air quality standards, and 85 percent of that impact is due to estimated airport emissions. Calculated maximum total PM_{10} 24-hour and annual impacts are 12 and 9 percent of applicable air quality standards, respectively.

Although additional modeling would be required to fully address potential air quality impacts that would be associated with plant operations at the Primm Plant Site, it is likely that they would be similar to those of the Goodsprings Plant Site. Other factors that are likely to affect air quality in the Ivanpah Valley include land use changes that would be attributable to induced development related to increased water availability (Las Vegas Valley Water District pipeline), land use changes associated with implementation of the Clark County Conservation of Public Lands and Natural Resources Act of 2002, and expansion of the KRGT Compressor Station at Goodsprings.

Cumulative Impacts to Noise

Potential cumulative impacts to noise levels that would be associated with the Ivanpah Energy Center at Goodsprings and continued operation of the KRGT Compressor Station at Goodsprings or development of the Ivanpah Energy Center at Primm and simultaneous operation of the Reliant Bighorn Facility are not expected to result in cumulative impacts to sensitive receptors. However, future actions such as operation of the Ivanpah Airport and land use changes related to water availability and those that could result from implementation of Clark County Conser-vation of Public Lands and Natural Resources Act of 2002 are likely to result in overall increases in noise levels in Ivanpah Valley; in some areas, related cumulative impacts could be significant.

Cumulative Impacts to Socioeconomics

Development and operation of the proposed Ivanpah Energy Center is expected to have negligible beneficial impacts to the economy and tax base of Clark County and the Goodsprings community. Cumulative beneficial and adverse socioeconomic impacts would be expected as a result of future actions that would change the character of Ivanpah Valley. Induced development related to increased water availability, the presence of Ivanpah Airport, and land use changes related to the implementation of Clark County Conservation of Public Lands and Natural Resources Act of 2002 are likely to change the character of the Goodsprings and Sandy Valley communities. Increased development is likely to result in cumulative beneficial affects to public services and the local tax base as a result of development; however, many residents are likely to experience adverse impacts as their lifestyle changes from rural to urban.

Cumulative Impacts to Environmental Justice

Development and operation of the Ivanpah Energy Center (regardless of plant site location) is not expected to affect minority or low-income populations. Due to the

absence of such populations within the Ivanpah Valley, adverse impacts related to other reasonably foreseeable projects are not anticipated.

6.3 SHORT-TERM USES OF THE ENVIRONMENT VERSUS LONG-TERM PRODUCTIVITY

Short-term uses is defined as the period of construction, though restoration actions. Long-term productivity is defined as the life of the project (at least 30 years), through decommissioning and restoration. Construction of the Ivanpah Energy Center (regardless of plant site location) and related facilities is expected to result in greater impacts than those of project operations and decommissioning. Construction at either the Goodsprings location or the Primm location commit the temporary use of 294 to 317 acres of federal land during construction. Long-term (permanent for the life of the project) commitments of federal land would range from nine acres (Primm Plant Site Alternative) to 42 acres (Proposed Goodsprings Plant Site Alternative). Lands that would be temporarily used during construction would represent a short-term use of the environment because they would be restored and returned to the BLM following restoration.

Short-term uses of the environment also would result in a variety of impacts to the physical, biological, and human environment as discussed in Section 5 (Impacts). However, such impacts would be offset during the life of the project through the generation of reliable power that would be available to the competitive market. The long-term availability of power would have far reaching benefits to society throughout southern Nevada and southern California.

6.4 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Construction and operation of the Ivanpah Energy Center (regardless of plant site location) and related facilities would require the commitment of a variety of resources that cannot be replaced, restored, or recovered. Project construction also would use a variety of resources that, after decommissioning of the facility, could be restored and returned for use in the future. Resources that would be irreversibly used and irretrievably committed as part of the project are summarized in Table 6-5.

Table 6-5 Irreversible and Irretrievable Commitment of Resources

Resource Affected	Period of Commitment	Irreversible	Irretrievable
Geology, Soils, and Minerals Resources	Long-term accelerated soil erosion on steep slopes	Yes	Yes
Groundwater/Surface Water Resources	Negligible groundwater needs	Yes	Yes
Biological Resources	Long-term loss of habitat	No	No
Cultural Resources	Loss during construction	Yes	Yes
Paleontological Resources	Loss during construction	Yes	Yes
Land Use and Zoning	Long-term	No	No
Range Management	Temporary use of area	No	No
Recreation	Temporary use of area	No	No
Transportation	Temporary use of area	No	No
Public Services and Utilities	Long-term	---	No
Hazardous Materials	Primarily during construction	No	No
Visual Resources	Long-term (life of project)	No	No
Air Quality	Long-term (life of project)	No	No
Noise	Long-term (life of project)	--	No
Socioeconomics	Primarily during construction	No	No
Environmental Justice	Not determined to be an issue	---	---

6.5 ENVIRONMENTALLY SENSITIVE AREAS NOT AFFECTED

The Mojave National Scenic Preserve and the Stateline and Mesquite Wilderness areas are well removed from the proposed IEC plant site, access roads, the water supply pipeline route, or transmission line rights-of-way that are incorporated into the proposed action. Similarly, the Red Rock Canyon Conservation Area, the Spring Mountains National Recreation Area, and the North and South McCullough Mountains Wilderness Study Areas would not be affected by construction or operation of the proposed project or its components.

Information received from the Nevada Department of Conservation and Natural Resources Commission for the Preservation of Wild Horses (Barcomb, 2002) indicates that the project site is "… located several miles south of the Red Rock Herd Management Area …" and that the proposed action would not affect wild horse and burro herds.