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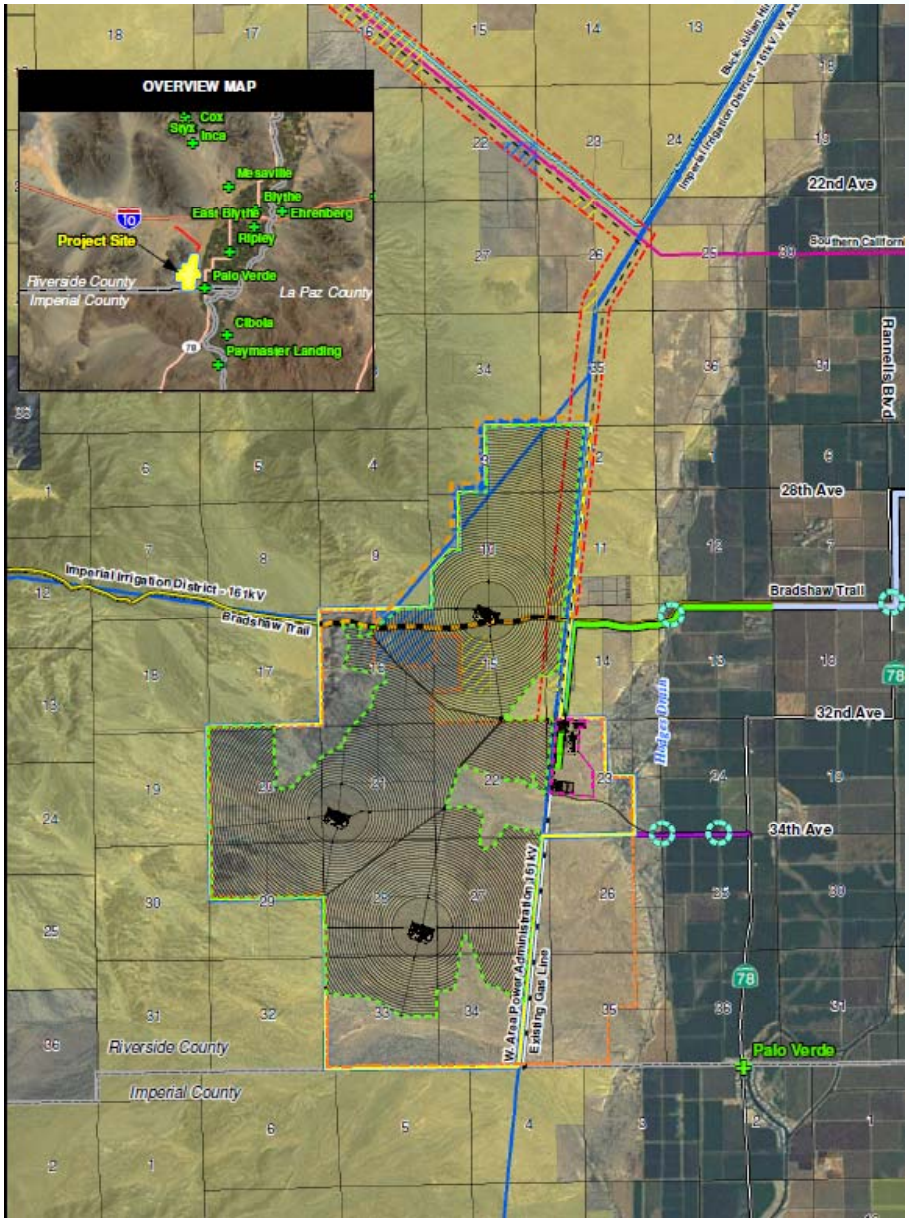
RIO MESA SOLAR ELECTRIC GENERATING FACILITY
CEC BIOLOGICAL RESOURCES WORKSHOP

March 13, 2012

PROJECT SETTING

Rio Mesa Solar – Project Layout



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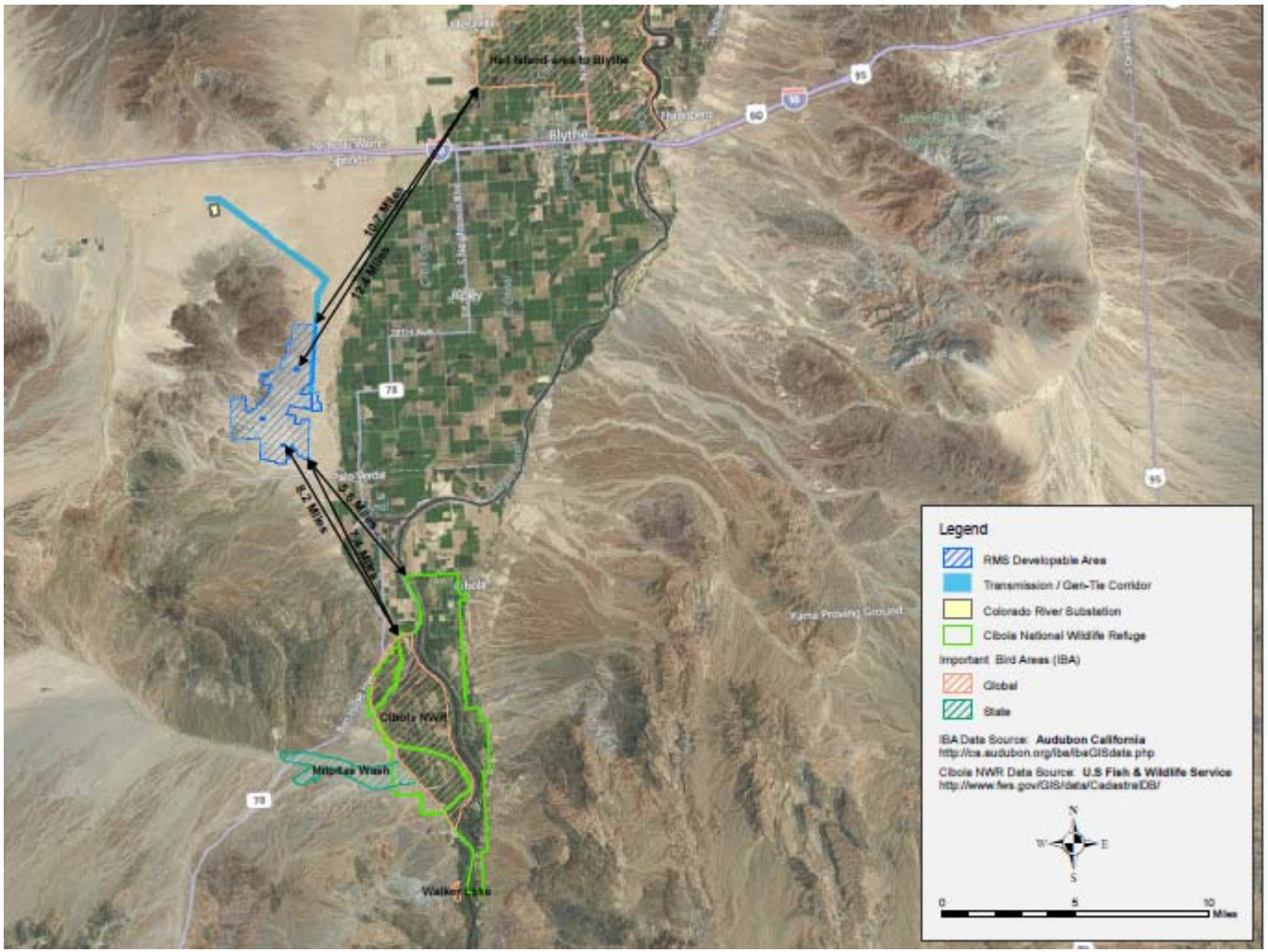
Rio Mesa Solar – Relative Location



National Wildlife Refuges within 100 miles

- Havasu – 70 miles
- Bill Williams – 65 miles
- Imperial – 18 miles
- Cibola (shown) – 5.6 miles

Audubon Society Globally Important Bird Areas

Two nearest areas are shown on adjacent map and are 8+ (Cibola) and 10+ (Hall Island) miles away from closest tower of project

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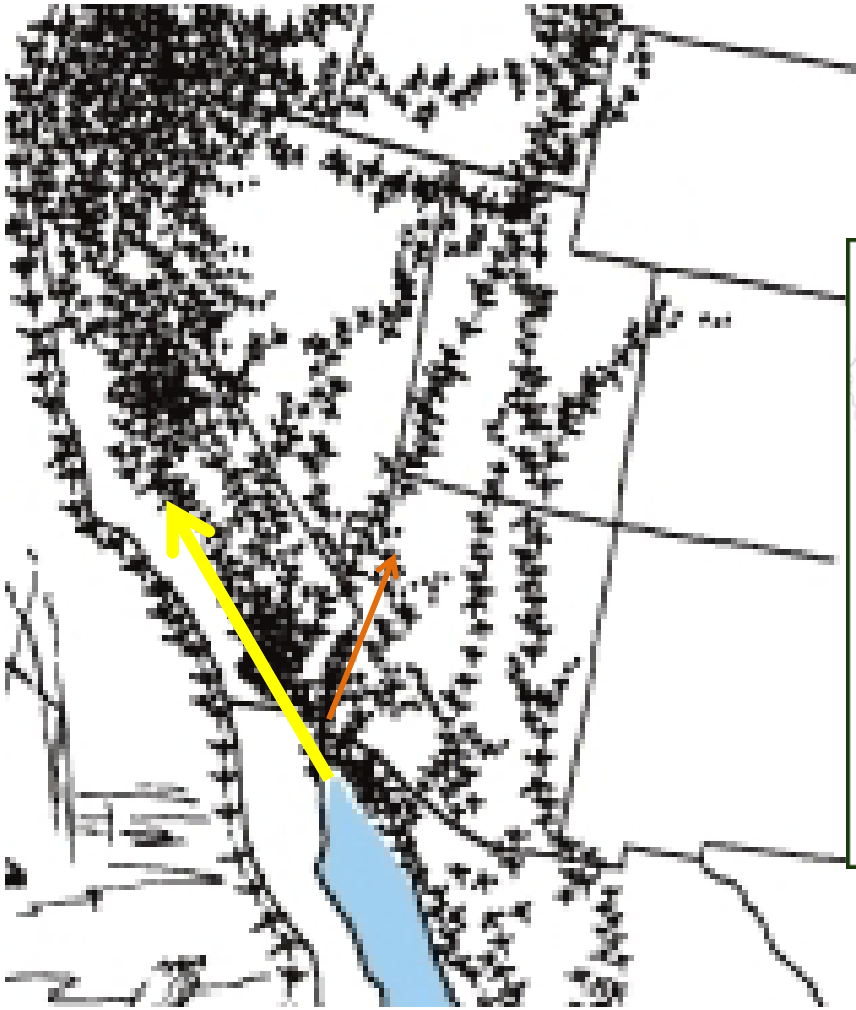
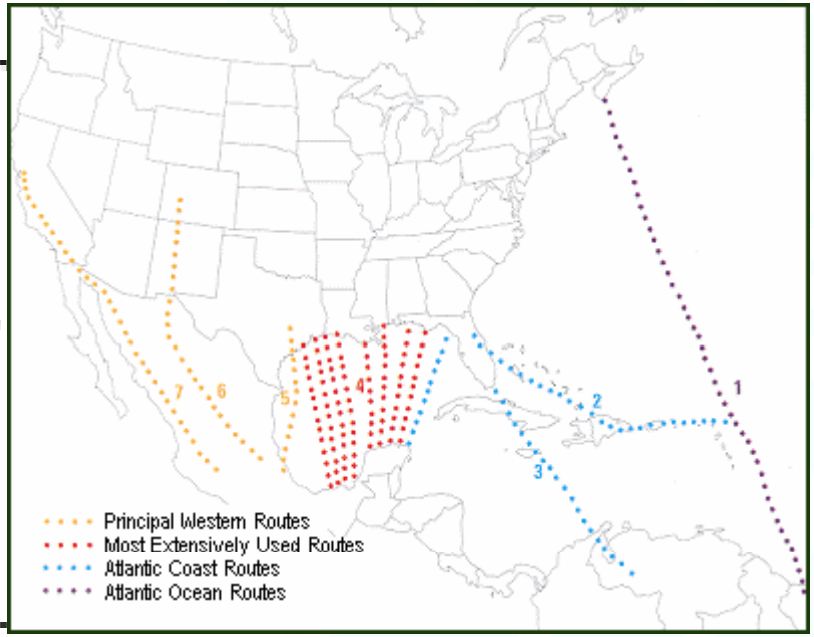
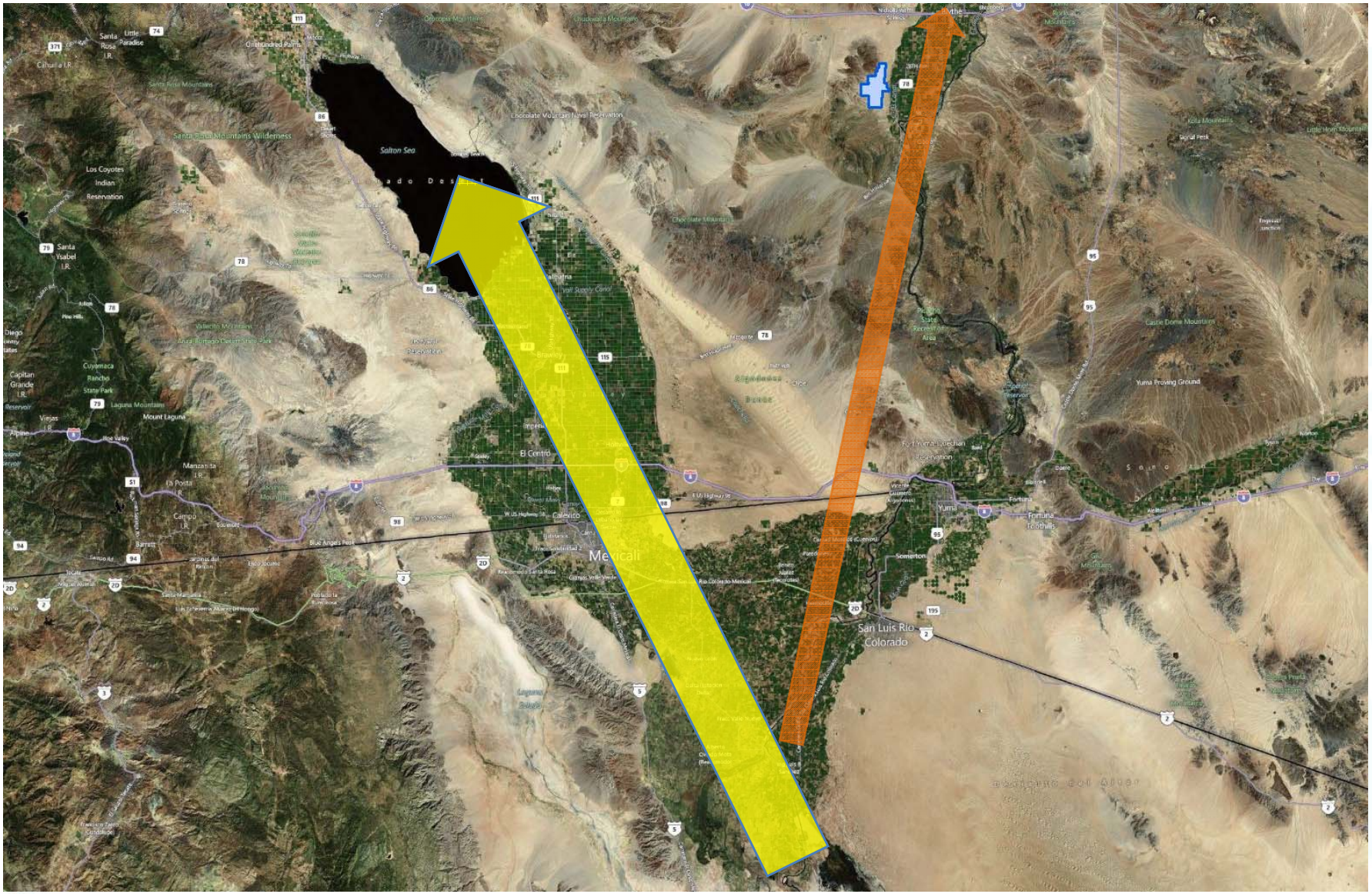
Rio Mesa Solar – USFWS and USGS Pacific Flyway Maps





Southern CA/Mexico – Pacific Flyway Satellite View



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AVIAN RISK FROM POWER TOWER TECHNOLOGY

Rio Mesa Solar – Risk Factors for Tower Technology

While examining our LPT technology we have identified 4 main factors that may present a risk to avian birds and raptors.

- Areas of high concentration of (light) energy flux near the SRSG surface and standby zones
- Areas of elevated ambient temperature due to convection of heat from the surface of the SRSG
- Birds collisions with the Heliostat mirrors and the Power Towers
- Environmental setting. Immediate surrounding habitat that may attract birds

Rio Mesa Solar – Risk Factors for Tower Technology

- Areas of high concentration of (light) energy flux near the SRSG surface and standby zones

Solar One	SEDC	Rio Mesa
When Solar One was operating, common practice was a maximum flux on the receiver of 500-600kW/m^2 . Heliostat Aiming controls were primitive by today's standards, so substantial use of the standby point system was essential to control flux on the boiler. Based on BSE's engineers' familiarity with the project, flux concentration at those standby points was estimated to be ~1500kW/m^2.	Maximum flux on the receiver is 600kW per square meter. Two standby points are used. Improvements in the heliostat control technology allows reduction of the flux concentration at those standby points to around 1000kW/m^2. Although no formal study has been undertaken at SEDC, in over 3 years of site operations at the facility there were no observations of avian mortality.	Maximum flux on the receiver will be 600kW per square meter. Advances in heliostat control technology permits BrightSource to eliminate standby points, replacing them with a standby zone that will form a ring-like shape around the SRSG. This will greatly reduce flux concentration since each heliostat will be aimed at a slightly different point. BSE estimates the flux concentration in the standby zone to be no more than 500kW/m^2.

Solar One – Standby Points

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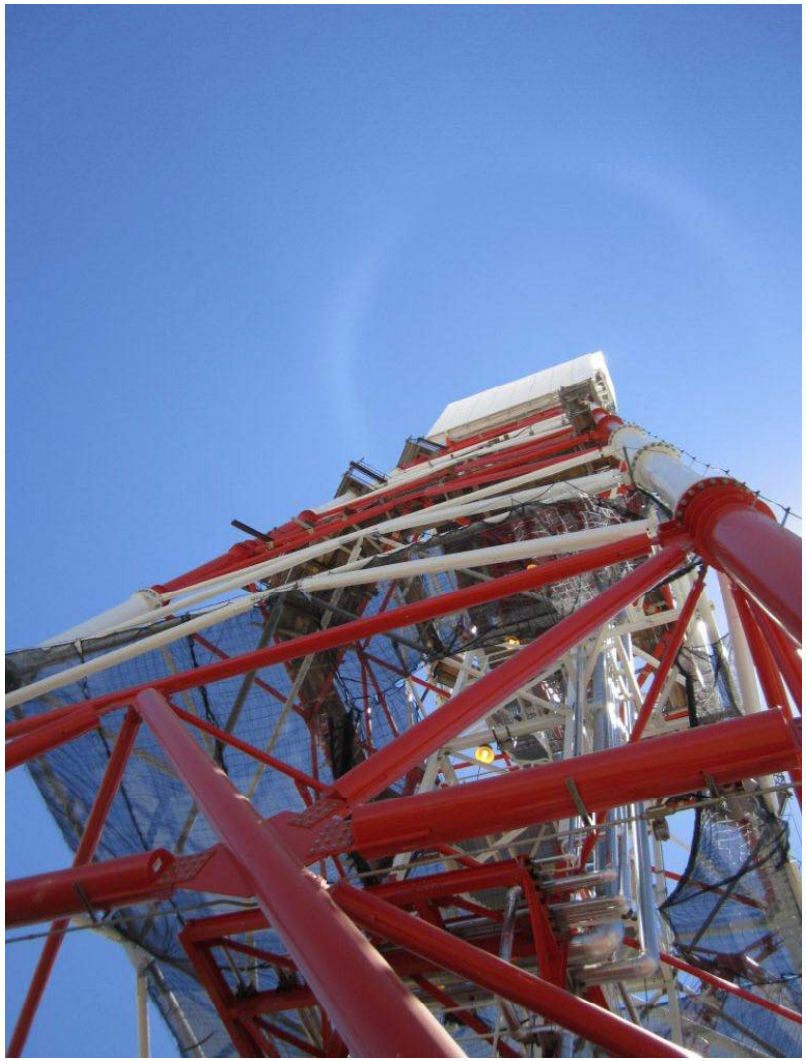
Coalinga – Standby Ring or Halo



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Rio Mesa Solar – Risk Factors for Tower Technology

- Areas of elevated ambient temperature due to convection of heat from the surface of the SRSG

Solar One	SEDC	Rio Mesa
No direct data about this factor at Solar One is available at this time. Since coatings at Solar One and SEDC are similar, we can assume, with a certain amount of confidence, that the physical mechanism was very similar to what has been modeled for our SEDC and Ivanpah facilities.	Modeling[1] indicates that significantly elevated air temperatures around the SRSG are limited to only a few inches from the surface, at which point the temperature is only 40°c above ambient. Temperatures then drop rapidly with further distance from the SRSG.	Modeling[1] indicates the elevated temperature area will extend less than 5 meters from the SRSG face horizontally and down-wind. Above the SRSG at 1.5 meters, the air temperature will drop to ~15°C above ambient, and will continue to dissipate rapidly such that at a distance of 20 meters (SRSG width) above the SRSG temper-ature is at ambient.

Note 1: Modeling was performed using a Computational Fluid Dynamics (CFD) program.

Rio Mesa Solar – Risk Factors for Tower Technology

- Birds collisions with the Heliostat mirrors and the Power Tower

Solar One	SEDC	Rio Mesa
Solar One used several types of heliostats, most of which were large and had multiple mirrors (510 ft^2) and reached as high as 26.5' above grade. No data exists for mortality of night-time migratory birds at Solar One.	SEDC uses mostly the single mirror LH-1 (75 ft^2) and some dual mirror LH-2 (150 ft^2) heliostats. Both types reach about 12-13 ft. above grade. Although no formal study has been undertaken at SEDC, 3+ years of ground activity at the facility has yielded no observations of avian mortality. Gemasolar plant has similar results.	Rio Mesa will use dual mirror LH-2.3 heliostats with a surface area of 204 ft^2, and a maximum height of 13.5 feet above grade. *Tower Issue:* A radar study at the Blythe airport spanning 6 years revealed that ~85% of night-time migration occurred at an altitude of ≥1000 ft (R.L. McKiernan pers. comm. 2012). In addition, risk of collision with the RMS towers is minimized by: non-reflective concrete construction, appropriate FAA lighting, relatively small (60-80 ft.) horizontal profile, no spinning blades, and no guy-wires. The highest risk of collision from nighttime migratory birds is during inclement foggy weather (seldom) and moonless nights (1-2 days/month).

Rio Mesa Solar – Risk Factors for Tower Technology

- Environmental setting. Immediate surrounding habitat that may attract birds

Solar One	SEDC	Rio Mesa
Solar One was situated directly adjacent to irrigated farm land and had ~126 acres of un-netted evaporation ponds directly adjacent to the Solar field. These factors attracted significant avian activity to the Solar One project site.	SEDC is located within the Syrian-African fault, a major flyway for migratory birds in the region. No open water or farm land is near SEDC. This suggests that Solar One's bird issues may be a site-specific issue related to the adjacent farming and open water.	RMS's heliostat fields will be located in areas of desert scrub approximately one mile away from irrigated agricultural fields. There are no permanent streams, rivers, or riparian habitat on or adjacent to the site. Only 4 acres of netted evaporation ponds east of the solar field are planned. The Colorado River is about 4.5 miles away at its closest reach, and is typically 6-8 miles from the site. The Colorado River is a secondary route of the primary Pacific Flyway, which is over 100 miles to the west, and connects the Sea of Cortez with the Salton Sea and Peninsular Mountain Ranges to California Central Valley and Great Basin areas.

Solar One – Landscape

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Ivanpah SEGS – LH-2 Heliostat (RMS slightly larger)

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PROPOSED ADDITIONAL SURVEYS FOR 2012

Rio Mesa Solar – Proposed Additional Surveys

Applicant believes that the surveys conducted in 2011 are compliant with CEC requirements for biological analysis of impacts for the Rio Mesa Project.

Applicant has endeavored to address the REAT Agencies' concerns by employing highly respected avian specialists.

Dr. Pete Bloom is consulting on the Project's 2012 proposed survey effort and is the lead biologist for Phase 1 and 2 golden eagle helicopter surveys and supplemental ground surveys during the 2012 breeding season.

In addition, Dr. Pat Brown, a bat expert who has extensively studied bat populations in the project vicinity, will also be consulting on the Project.

Rio Mesa Solar – Proposed Additional Surveys

1. *Migratory Birds:* Additional migratory bird surveys will be conducted from February 21, 2012 through May 31, 2012, and from August 15, 2012 to November 1, 2012. The survey protocol to be used is the REAT recommended protocol dated 12/16/11 and the observation points approved in Data Request Set 1A.

2. *Raptor Migration:* Raptor migration surveys will be conducted from March 7, 2012 through April 30, 2012, and from September 1, 2012 to November 30, 2012. The survey protocol to be used is the REAT recommended protocol dated 12/16/11 and the observation points approved in Data Request Set 1A.

3. *Golden Eagles:* Phase 1 and 2 golden eagle helicopter surveys and supplemental ground surveys will be conducted during the 2012 breeding season following Pagel et al. 2010 as suggested in the REAT recommended protocol dated 12/16/11. Pete Bloom is the lead biologist for these surveys. This survey will begin on March 24, 2012.

Rio Mesa Solar – Proposed Additional Surveys

4. *Gila Woodpecker:* Surveys for Gila woodpecker and other breeding birds will be conducted based on the protocol described in Data Request Set 1A. First survey was completed March 7-9, 2012.

5. *Elf Owl:* Surveys for elf owl will be conducted based on the cactus ferruginous pygmy-owl protocol as suggested in Data Request Set 1A, if required by the Committee.

6. *Bats:* Bat monitoring started on February 9, 2012 and will continue for 1 full year using Anabat acoustical monitoring on the project site using the REAT recommended protocol dated 12/16/11 and the three REAT approved Anabat monitoring stations.

7. *Nocturnal Migrant Songbirds:* Radar technology will be utilized to monitor spring and fall nocturnal migration pulses of avifauna five nights per week from March 12, 2012 through May 31, 2012, and from September 1, 2012 to October 31, 2012.


Questions and Answers