

APPENDIX D | LAND USE EFFICIENCIES FOR INDIVIDUAL PROJECTS

Abengoa - Parabolic Trough		
Area Efficiency Analysis		
	Quantity	Total (acres)
Total Site Area (acres)	1	1,765
<i>Solar thermal collector array fields¹</i>	2	1,420.00
<i>Total bldgs²</i>	1	4.25
<i>Power Island²</i>	2	40.00
<i>Total paved road²</i>	1	1.75
Total Disturbed Land (acres)	1,466	
Ratio of Disturbed Land to Site Area as %	83.06%	
<i>Nameplate Capacity (MW)</i>	250	
<i>Capacity Factor</i>	0.274	
Actual Annual Electricity Production (MWh)	600,471	
Ratio of Elec Production to Disturbed Land (MWh/acre)	409.60	
Ratio of Disturbed Land to Elec Production (acres/MW)	5.86	
NOTES		
1: Each field is 710 acres and there are two fields for this project. Page 2.0-5 of Project Description document in Application for Completion (AFC).		
2: Page 2.0-24 of Project Description document in the AFC.		

Beacon - Parabolic Trough		
Area Efficiency Analysis		
	Quantity	Total (acres)
Total Site Area (acres)	1	2,012
<i>Solar thermal collector array fields¹</i>	1	1,244.00
<i>Total bldgs²</i>	1	0.71
<i>Power Block²</i>	1	23.00
<i>Total paved road²</i>	1	6.00
Total Disturbed Land (acres)	1,274	
Ratio of Disturbed Land to Site Area as %	63.31%	
<i>Nameplate Capacity (MW)</i>	250	
<i>Capacity Factor</i>	0.265	
Actual Annual Electricity Production (MWh)	580,748	
Ratio of Elec Production to Disturbed Land (MWh/acre)	455.95	
Ratio of Disturbed Land to Elec Production (acres/MW)	5.09	
NOTES		
1: Page 2-8 of Project Description Document.		
2: Page 2-24 of Project Description Document.		

Chevron Lucerne Valley - Thin-Film Photovoltaic		
Area Efficiency Analysis		
	Quantity	Total
Total Site Area (acres)	-	516
<i>"Facility Footprint" I.e. total area w/n disturbance area that is inside security fencing encompassing all four units; excludes off-site linears {gen-tie transmission line and gas pipeline}</i>	-	273
Total Disturbance Area (acres)		279
<i>Nameplate Capacity (MW)</i>	60	
<i>Capacity Factor</i>	0.110	
Actual Annual Electricity Production (MWh)		57,856
Ratio of Elec Production to Disturbed Land (MWh/acre)		207.64
Ratio of Disturbed Land to Nameplate Capacity (acres/MW)		4.64
NOTES		
<p>The application materials for PV facilities are managed by the BLM and as of the time of this writing, were not available online. Therefore, we set an assumed capacity factor. Additionally, since application materials were not readily accessible, we determined the average percentage of disturbed area for a given site area and used this percentage to estimate the amount of Total Disturbance Area (in acres).</p>		

Desert Sunlight - Thin-Film Photovoltaic		
Area Efficiency Analysis		
	Quantity	Total
Total Site Area (acres)	-	4,410
<i>"Facility Footprint" I.e. total area w/n disturbance area that is inside security fencing encompassing all four units; excludes off-site linears {gen-tie transmission line and gas pipeline}</i>	-	3,500
Total Disturbance Area (acres)		2,381
<i>Nameplate Capacity (MW)</i>	550	
<i>Capacity Factor</i>	0.110	
Actual Annual Electricity Production (MWh)		530,343
Ratio of Elec Production to Disturbed Land (MWh/acre)		222.70
Ratio of Disturbed Land to Nameplate Capacity (acres/MW)		4.33
NOTES		
<p>The application materials for PV facilities are managed by the BLM and as of the time of this writing, were not available online. Therefore, we set an assumed capacity factor. Additionally, since application materials were not readily accessible, we determined the average percentage of disturbed area for a given site area and used this percentage to estimate the amount of Total Disturbance Area (in acres).</p>		

Genesis - Parabolic Trough		
Area Efficiency Analysis		
	Quantity	Total (acres)
Total Site Area (acres)	1	1,800
<i>Solar thermal collector array fields¹</i>	2	1,360.00
<i>Total bldgs²</i>	1	0.90
<i>Power Block²</i>	1	24.00
<i>Site access roads³</i>	1	24
Total Disturbed Land (acres)		1,409
Ratio of Disturbed Land to Site Area as %		78.27%
<i>Nameplate Capacity (MW)</i>		250
<i>Capacity Factor</i>		0.265
Actual Annual Electricity Production (MWh)		580,748
Ratio of Elec Production to Disturbed Land (MWh/acre)		412.20
Ratio of Disturbed Land to Elec Production (acres/MW)		5.64
NOTES		
1: Two facilities 125 MW each.		
2: Page 3-22 in Facility Description in Application for Completion (AFC)		
3: Page 3-3 in Facility Description document in AFC.		

Ivanpah - Solar Power Tower		
Area Efficiency Analysis		
	Quantity	Total
Total Site Area (acres)	1	3,400
<i>Ivanpah Solar Plant 1</i>	1	6.635
<i>Ivanpah Solar Plant 2</i>	1	5.197
<i>Ivanpah Solar Plant 3</i>	1	7.464
<i>Administration and Storage Building</i>	1	3.188
<i>Electrical Substation Building</i>	1	27.736
<i>Heliostats - 10.5' x 10.5'</i>	272,000	688.430
<i>Miles of Paved and Unpaved Roads¹</i>	-	-
Total Disturbed Land (acres)		739
<i>Nameplate Capacity (MW)</i>		400
<i>Capacity Factor</i>		0.270
Actual Annual Electricity Production (MWh)		946,728
Ratio of Elec Production to Disturbed Land (MWh/acre)		1,281.7
Ratio of Disturbed Land to Elec Production (acres/MW)		1.8
NOTES		
1.) The AFC does not include specific details on road construction, so it is not provided here.		
2.) The AFC did not include a list of proposed buildings, so the coverage areas listed here were calculated based on the proposed site maps included in the "Biological Resources" section.		

Palmdale - Parabolic Trough		
Area Efficiency Analysis		
	Quantity	Total (acres)
Total Site Area (acres)	1	2,012
<i>Solar thermal collector array fields¹</i>	1	250.00
<i>Total bldgs²</i>	1	0.84
<i>Power Block²</i>	1	19.00
<i>Total paved road²</i>	1	5.00
<i>Drainage, setbacks and access roads³</i>	1	51
Total Disturbed Land (acres)		326
Ratio of Disturbed Land to Site Area as %		16.19%
<i>Nameplate Capacity (MW)</i>		50
<i>Capacity Factor</i>		0.265
Actual Annual Electricity Production (MWh)		116,150
Ratio of Elec Production to Disturbed Land (MWh/acre)		356.46
Ratio of Disturbed Land to Elec Production (acres/MW)		6.52
NOTES		
1: The solar power plant is part of a hybrid natural gas power project.		
2: Page 2-28 in Project Description PDF document in the Application for Completion (AFC).		
3: Page 1 of NOR of AFC.		

Rice - Solar Power Tower		
Area Efficiency Analysis		
	Quantity	Total (acres)
Total Site Area (acres)	1	2,560
<i>Project/facility site¹</i>	1	1,410.00
<i>Site access roads²</i>	1	5.50
Total Disturbed Land (acres)		1,416
Ratio of Disturbed Land to Site Area as %		55.29%
<i>Nameplate Capacity (MW)</i>		150
<i>Capacity Factor</i>		0.340
Actual Annual Electricity Production (MWh)		447,066
Ratio of Elec Production to Disturbed Land (MWh/acre)		315.84
Ratio of Disturbed Land to Elec Production (acres/MW)		9.44
NOTES		
1: This includes heliostats, administration buildings, power block and evaporation pond areas. Page 1-7 of Rice Introduction Document.		
2: Page 1-8 of Rice Introduction Document.		

Tessera Solar One (Calico) - Stirling Dish Engine		
Area Efficiency Analysis		
	Quantity	Total
Total Site Area (acres)	1	8,230
<i>Off-Site Access Road</i>	-	11.0
<i>Off-Site Transmission Line</i>	-	0.9
<i>Construction Staging, Administration, and Laydown Areas</i>	-	63.0
<i>Site Boundary Fence</i>	-	55.0
<i>Paved and Unpaved Roadways (Main and Perimeter)</i>	-	153.0
<i>Main Services Complex</i>	-	42.0
<i>Satellite Services Complex</i>	-	21.0
<i>Solar One Substation and On-Site Transmission Line</i>	-	25.3
<i>Water Pipeline</i>	-	3.6
<i>SunCatchers¹</i>	34,000	986.5
<i>North-South Access Routes</i>	-	262.0
<i>East-West Access Routes²</i>	-	733.0
<i>Debris Basins for Off-Site Flows</i>	-	220.0
<i>Debris Basins for On-Site Flows</i>	-	65.0
<i>Electrical Collection System³</i>	-	333.0
Total Direct Disturbance Area (acres)		2,974.3
<i>Nameplate Capacity (MW)</i>		850
<i>Capacity Factor</i>		0.399
Actual Annual Electricity Production (MWh)		2,975,000
Ratio of Elec Production to Disturbance Area (MWh/acre)		1,000.2
Ratio of Disturbed Land to Elec Production (acres/MW)		3.50
NOTES		
1: Includes foundations, pad clearing, and drainage swales. Square footage of the pedestals for each SunCatcher are 14' x 14'.		
2: Includes access roads within the area of limited disturbance and roads servicing each SunCatcher PCU.		

Tessera Solar Two (Imperial Valley) - Stirling Dish Engine		
Area Efficiency Analysis		
	Quantity	Total
Total Site Area (acres)	-	6,500
<i>Off-Site Access Roads</i>	-	4.5
<i>On-Site Paved and Unpaved Roadways</i>	-	153.8
<i>Off-Site Transmission Line</i>	-	91.6
<i>On-Site Transmission Line²</i>	-	109.1
<i>Waterline and Pumping Station</i>	-	8.0
<i>Construction Staging, Administration, and Laydown Areas</i>	-	37.0
<i>Site Boundary Fence</i>	-	29.9
<i>Main Services Complex¹</i>	-	28.4
<i>On-Site Wet and Dry Utilities Access</i>	-	12.5
<i>Solar Two Substation</i>	-	7.7
<i>North-South Access Routes</i>	-	245.0
<i>East-West Access Routes</i>	-	148.3
<i>Electrical Collection System</i>	-	55.0
<i>SunCatcher Generating Systems</i>	30,000	2,175.0
Total Direct Disturbance Area (acres)		3,106
<i>Nameplate Capacity (MW)</i>	750	
<i>Capacity Factor</i>	0.399	
Actual Annual Electricity Production (MWh)		2,625,000
Ratio of Elec Production to Disturbance Area (MWh/acre)		845.2
Ratio of Disturbed Land to Elec Production (acres/MW)		4.14
NOTES		
1: Includes service building, parking area, assembly buildings, and storage.		
2: Includes an estimated 75 acres of disturbance from transmission poles.		

Solar Millennium Blythe - Parabolic Trough		
Area Efficiency Analysis		
	Quantity	Total
Total Site Area (acres)	-	7,030
<i>"Facility Footprint" i.e. total area w/n disturbance area that is inside security fencing encompassing all four units; excludes off-site linears {gen-tie transmission line and gas pipeline}</i>	-	259,182,000
Total Disturbance Area (acres)		5,950
<i>Nameplate Capacity (MW)</i>	1,000	
<i>Capacity Factor</i>	0.239	
Actual Annual Electricity Production (MWh)		2,095,074
Ratio of Elec Production to Disturbed Land (MWh/acre)		352.11
Ratio of Disturbed Land to Elec Production (acres/MW)		5.95
NOTES		
Solar Millenium provided the "facility footprint" within their Application for Certification - a specific breakdown of buildings was not included.		

Solar Millennium Palen - Parabolic Trough		
Area Efficiency Analysis		
	Quantity	Total
Total Site Area (acres)	-	5,200
<i>Facility "Footprint" (i.e. area inside the fence line, which excludes gen-tie transmission line route outside the ROW)</i>	1	2,970
<i>Central Warehouse and Main Office Buildings³</i>	1	2.801
<i>Buildings in Power Block 1³</i>	1	0.716
<i>Buildings in Power Block 2³</i>	1	0.716
Total Disturbance Area (acres)		2,970
<i>Nameplate Capacity (MW)</i>		500
<i>Capacity Factor</i>		0.228
Actual Annual Electricity Production (MWh)		999,324
Ratio of Elec Production to Disturbed Land (MWh/acre)		336.5
Ratio of Disturbed Land to Elec Production (acres/MW)		5.94
NOTES		
1.) This capacity factor was not provided in the AFC, but was calculated using information taken from the "Project Description" section.		
2.) Solar Millenium provided the "facility footprint" within their Application for Certification - a specific breakdown of buildings was not included.		
3.) These square footages were not included into the Total Disturbance Area row, as they area they covered is included in the Facility "Footprint" listed in the first row.		

Solar Millennium Ridgecrest - Parabolic Trough		
Area Efficiency Analysis		
	Quantity	Total
Total Site Area (acres)	-	3,920
<i>Facility "Footprint" (i.e. area inside the fence line, which excludes gen-tie transmission line route outside the ROW)</i>	-	1,760
<i>Footprint of buildings outside the power block³</i>	1	2.801
<i>Footprint of buildings inside of the power block³</i>	1	0.716
Total Disturbance Area (acres)		1,760
<i>Nameplate Capacity (MW)</i>		250
<i>Capacity Factor</i>		0.228
Actual Annual Electricity Production (MWh)		499,662
Ratio of Elec Production to Disturbed Land (MWh/acre)		283.90
Ratio of Disturbed Land to Elec Production (acres/MW)		7.04
NOTES		
1.) This capacity factor was not provided in the AFC, but was calculated using information taken from the "Project Description" section.		
2.) Solar Millenium provided the "facility footprint" within their Application for Certification - a specific breakdown of buildings was not included.		
3.) These square footages were not included into the Total Disturbance Area row, as they area they covered is included in the Facility "Footprint" listed in the first row.		