

# Front Range Midway Solar Project - Key Observation Point 1

## Existing View



**KOP 1**

**Name**  
Boca Raton Heights & Rancho  
Colorado Blvd

**Latitude/Longitude**  
38.5508/-104.6507

**Direction/Distance**  
East / 2,000 ft



Vicinity Map

## Proposed View



# Front Range Midway Solar Project - Key Observation Point 2

## Existing View



KOP 2

Name

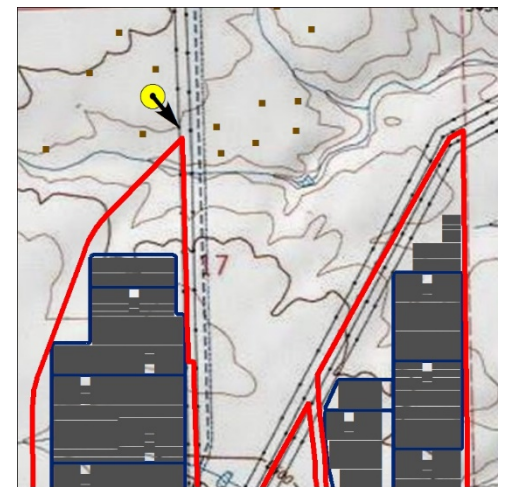
High Plains View

Latitude/Longitude

38.5739/-104.6918

Direction/Distance

North / 1,700 ft



Vicinity Map

## Proposed View



Project #17-012  
Date 08/17/2017



# Front Range Midway Solar Project - Key Observation Point 3

## Existing View



**KOP 3**

**Name**

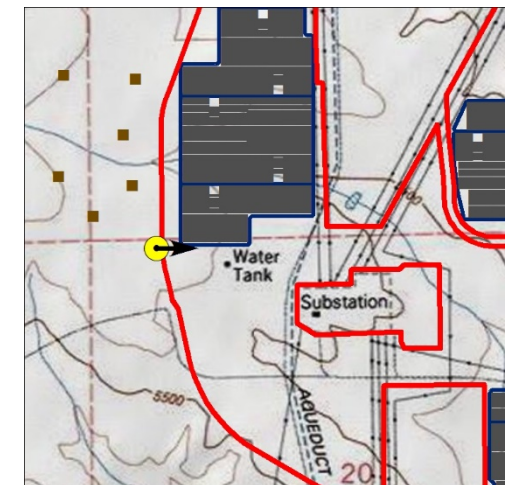
Boca Raton Heights Mailboxes

**Latitude/Longitude**

38.5620/-104.6974

**Direction/Distance**

West / 250 ft



Vicinity Map

## Proposed View



Project #17-012  
Date 08/17/2017



# Front Range Midway Solar Project - Key Observation Point 4

## Existing View



KOP 4

Name

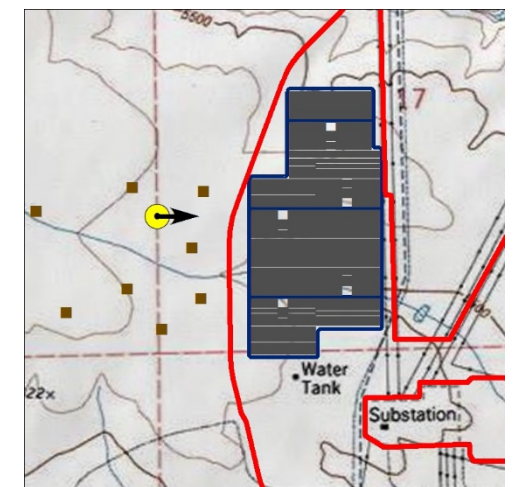
High Plains View

Latitude/Longitude

38.5665/-104.7001

Direction/Distance

West / 800 ft



Vicinity Map

## Proposed View



Project #17-012  
Date 08/17/2017



# Front Range Midway Solar Project - Key Observation Point 5

## Existing View



**KOP 5**

**Name**

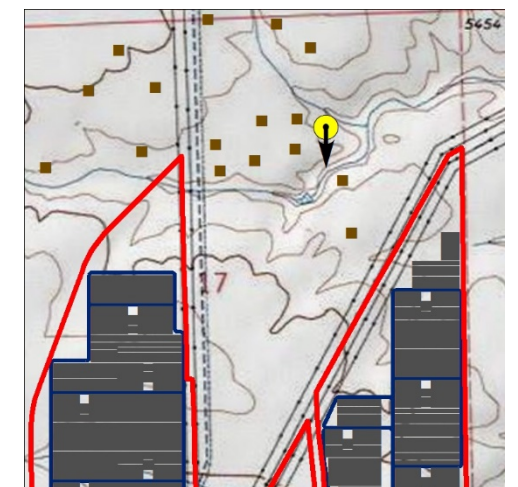
Chewy Ct & La Questa Dr

**Latitude/Longitude**

38.5723/-104.6845

**Direction/Distance**

North / ½ Mile



Vicinity Map

## Proposed View



**CORE**  
CONSULTANTS

Project #17-012  
Date 08/17/2017

# Solar Glare Hazard Analysis Report

Generated Aug. 18, 2017, 11:20 a.m.

No glare found

 Print



## Inputs

Analysis name	FrontRange
PV array axis tracking	single
Tilt of tracking axis (deg)	0.0
Orientation of tracking axis (deg)	180.0
Offset angle of module (deg)	0.0
Limit rotation angle?	True
Maximum tracking angle (deg)	45.0

Rated power (kW)	5000.0
Vary reflectivity	True
PV surface material	Smooth glass without ARC

Timezone offset	-7.0
Subtended angle of sun (mrad)	9.3
Peak DNI (W/m <sup>2</sup> )	1000.0
Ocular transmission coefficient	0.5
Pupil diameter (m)	0.002
Eye focal length (m)	0.017
Time interval (min)	1
Correlate slope error with material	False
Slope error (mrad)	10.0

## PV array vertices

id	Latitude (deg)	Longitude (deg)	Ground Elevation (ft)	Height of panels above ground (ft)	Total elevation (ft)
1	38.5716559845	-104.693312645	5471.92	7.0	5478.92
2	38.570179661	-104.694943428	5496.34	7.0	5503.34
3	38.5685019839	-104.695887566	5515.5	7.0	5522.5
4	38.5651465122	-104.696745872	5513.98	7.0	5520.98
5	38.5625291354	-104.696745872	5519.27	7.0	5526.27
6	38.5626633622	-104.692025185	5505.4	7.0	5512.4
7	38.5625962489	-104.68644619	5489.12	7.0	5496.12
8	38.5558845972	-104.686102867	5470.32	7.0	5477.32

id	Latitude (deg)	Longitude (deg)	Ground Elevation (ft)	Height of panels above ground (ft)	Total elevation (ft)
9	38.5558174775	-104.690136909	5496.67	7.0	5503.67
10	38.5518573054	-104.689793587	5476.13	7.0	5483.13
11	38.5524614135	-104.675374031	5456.85	7.0	5463.85
12	38.5526627818	-104.658293724	5341.78	7.0	5348.78
13	38.5526627818	-104.654688835	5341.59	7.0	5348.59
14	38.555683238	-104.655461311	5358.58	7.0	5365.58
15	38.5576968049	-104.658722878	5375.59	7.0	5382.59
16	38.558300864	-104.660868645	5379.33	7.0	5386.33
17	38.5593076178	-104.663443565	5388.72	7.0	5395.72
18	38.5625962489	-104.663786888	5363.87	7.0	5370.87
19	38.5625291354	-104.671511165	5427.96	7.0	5434.96
20	38.5610526245	-104.674086571	5441.48	7.0	5448.48
21	38.5599116634	-104.68018055	5483.89	7.0	5490.89
22	38.5599787793	-104.682154655	5492.73	7.0	5499.73
23	38.5713875643	-104.681982994	5451.43	7.0	5458.43
24	38.5713875643	-104.684729576	5464.65	7.0	5471.65
25	38.564206952	-104.687905312	5499.01	7.0	5506.01
26	38.564206952	-104.691252708	5495.96	7.0	5502.96
27	38.5723270305	-104.691510201	5459.83	7.0	5466.83

## Observation Points

Latitude (deg)	Longitude (deg)	Ground Elevation (ft)	Eye-level height above ground (ft)
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1	38.5858137277	-104.668786526	5331.29	5.5
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No glare found.

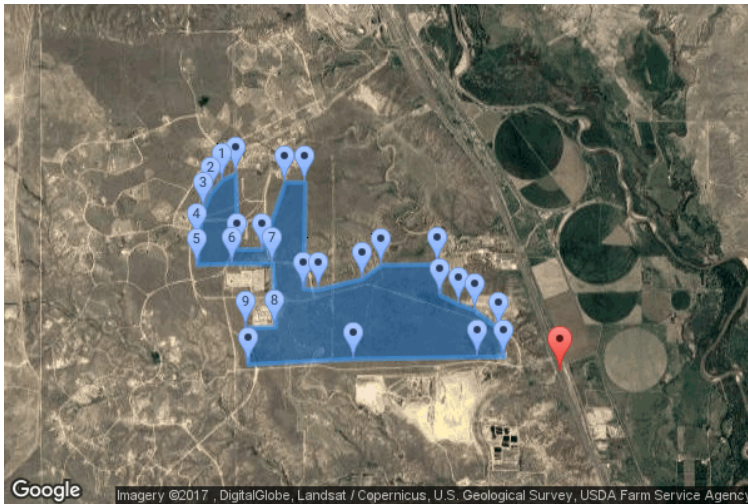
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# Solar Glare Hazard Analysis Report

Generated Aug. 18, 2017, 11:20 a.m.

No glare found

 Print



## Inputs

Analysis name	FrontRange
PV array axis tracking	single
Tilt of tracking axis (deg)	0.0
Orientation of tracking axis (deg)	180.0
Offset angle of module (deg)	0.0
Limit rotation angle?	True
Maximum tracking angle (deg)	45.0

Rated power (kW)	5000.0
Vary reflectivity	True
PV surface material	Smooth glass without ARC

Timezone offset	-7.0
Subtended angle of sun (mrad)	9.3
Peak DNI (W/m <sup>2</sup> )	1000.0
Ocular transmission coefficient	0.5
Pupil diameter (m)	0.002
Eye focal length (m)	0.017
Time interval (min)	1
Correlate slope error with material	False
Slope error (mrad)	10.0

## PV array vertices

id	Latitude (deg)	Longitude (deg)	Ground Elevation (ft)	Height of panels above ground (ft)	Total elevation (ft)
1	38.5716559845	-104.693312645	5471.92	7.0	5478.92
2	38.570179661	-104.694943428	5496.34	7.0	5503.34
3	38.5685019839	-104.695887566	5515.5	7.0	5522.5
4	38.5651465122	-104.696745872	5513.98	7.0	5520.98
5	38.5625291354	-104.696745872	5519.27	7.0	5526.27
6	38.5626633622	-104.692025185	5505.4	7.0	5512.4
7	38.5625962489	-104.68644619	5489.12	7.0	5496.12
8	38.5558845972	-104.686102867	5470.32	7.0	5477.32

id	Latitude (deg)	Longitude (deg)	Ground Elevation (ft)	Height of panels above ground (ft)	Total elevation (ft)
9	38.5558174775	-104.690136909	5496.67	7.0	5503.67
10	38.5518573054	-104.689793587	5476.13	7.0	5483.13
11	38.5524614135	-104.675374031	5456.85	7.0	5463.85
12	38.5526627818	-104.658293724	5341.78	7.0	5348.78
13	38.5526627818	-104.654688835	5341.59	7.0	5348.59
14	38.555683238	-104.655461311	5358.58	7.0	5365.58
15	38.5576968049	-104.658722878	5375.59	7.0	5382.59
16	38.558300864	-104.660868645	5379.33	7.0	5386.33
17	38.5593076178	-104.663443565	5388.72	7.0	5395.72
18	38.5625962489	-104.663786888	5363.87	7.0	5370.87
19	38.5625291354	-104.671511165	5427.96	7.0	5434.96
20	38.5610526245	-104.674086571	5441.48	7.0	5448.48
21	38.5599116634	-104.68018055	5483.89	7.0	5490.89
22	38.5599787793	-104.682154655	5492.73	7.0	5499.73
23	38.5713875643	-104.681982994	5451.43	7.0	5458.43
24	38.5713875643	-104.684729576	5464.65	7.0	5471.65
25	38.564206952	-104.687905312	5499.01	7.0	5506.01
26	38.564206952	-104.691252708	5495.96	7.0	5502.96
27	38.5723270305	-104.691510201	5459.83	7.0	5466.83

## Observation Points

Latitude (deg)	Longitude (deg)	Ground Elevation (ft)	Eye-level height above ground (ft)
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2	38.55105182	-104.646942616	5272.08	5.5
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No glare found.

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# Solar Glare Hazard Analysis Flight Path Report

Generated Aug. 18, 2017, 11:21 a.m.

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Flight path: 1

No glare found

 Print



## Analysis & PV array parameters

Analysis name	FrontRange
PV array axis tracking	single
Tilt of tracking axis (deg)	0.0
Orientation of tracking axis (deg)	180.0
Offset angle of module (deg)	0.0
Limit rotation angle?	True
Maximum tracking angle (deg)	45.0
Rated power (kW)	5000.0
Vary reflectivity	True
PV surface material	Smooth glass without ARC

Timezone offset	-7.0
Subtended angle of sun (mrad)	9.3
Peak DNI (W/m <sup>2</sup> )	1000.0
Ocular transmission coefficient	0.5
Pupil diameter (m)	0.002
Eye focal length (m)	0.017
Time interval (min)	1
Correlate slope error with material	False
Slope error (mrad)	10.0

## Flight path parameters

Direction (deg)	312.81
Glide slope (deg)	3.0
Consider pilot visibility from cockpit	False

# PV array vertices

id	Latitude (deg)	Longitude (deg)	Ground Elevation (ft)	Height of panels above ground (ft)	Total elevation (ft)
1	38.5716559845	-104.693312645	5471.92	7.0	5478.92
2	38.570179661	-104.694943428	5496.34	7.0	5503.34
3	38.5685019839	-104.695887566	5515.5	7.0	5522.5
4	38.5651465122	-104.696745872	5513.98	7.0	5520.98
5	38.5625291354	-104.696745872	5519.27	7.0	5526.27
6	38.5626633622	-104.692025185	5505.4	7.0	5512.4
7	38.5625962489	-104.68644619	5489.12	7.0	5496.12
8	38.5558845972	-104.686102867	5470.32	7.0	5477.32
9	38.5558174775	-104.690136909	5496.67	7.0	5503.67
10	38.5518573054	-104.689793587	5476.13	7.0	5483.13
11	38.5524614135	-104.675374031	5456.85	7.0	5463.85
12	38.5526627818	-104.658293724	5341.78	7.0	5348.78
13	38.5526627818	-104.654688835	5341.59	7.0	5348.59
14	38.555683238	-104.655461311	5358.58	7.0	5365.58
15	38.5576968049	-104.658722878	5375.59	7.0	5382.59
16	38.558300864	-104.660868645	5379.33	7.0	5386.33
17	38.5593076178	-104.663443565	5388.72	7.0	5395.72
18	38.5625962489	-104.663786888	5363.87	7.0	5370.87
19	38.5625291354	-104.671511165	5427.96	7.0	5434.96
20	38.5610526245	-104.674086571	5441.48	7.0	5448.48
21	38.5599116634	-104.68018055	5483.89	7.0	5490.89

id	Latitude (deg)	Longitude (deg)	Ground Elevation (ft)	Height of panels above ground (ft)	Total elevation (ft)
22	38.5599787793	-104.682154655	5492.73	7.0	5499.73
23	38.5713875643	-104.681982994	5451.43	7.0	5458.43
24	38.5713875643	-104.684729576	5464.65	7.0	5471.65
25	38.564206952	-104.687905312	5499.01	7.0	5506.01
26	38.564206952	-104.691252708	5495.96	7.0	5502.96
27	38.5723270305	-104.691510201	5459.83	7.0	5466.83

## Flight Path Observation Points

	Latitude (deg)	Longitude (deg)	Ground Elevation (ft)	Eye-level height above ground (ft)	Glare?
Threshold	38.6733820132	-104.750390053	5788.11	50.0	No
1/4 mi	38.6709262238	-104.746990394	5770.49	136.8	No
1/2 mi	38.6684704344	-104.743590736	5754.69	221.79	No
3/4 mi	38.6660146451	-104.740191077	5728.09	317.55	No
1 mi	38.6635588557	-104.736791418	5724.7	390.12	No
1 1/4 mi	38.6611030663	-104.73339176	5692.08	491.93	No
1 1/2 mi	38.658647277	-104.729992101	5700.45	552.73	No
1 3/4 mi	38.6561914876	-104.726592443	5655.73	666.64	No
2 mi	38.6537356982	-104.723192784	5678.93	712.61	No

No glare found.

# Solar Glare Hazard Analysis Flight Path Report

Generated Aug. 18, 2017, 11:21 a.m.

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Flight path: 2

No glare found

 Print



## Analysis & PV array parameters

Analysis name	FrontRange
PV array axis tracking	single
Tilt of tracking axis (deg)	0.0
Orientation of tracking axis (deg)	180.0
Offset angle of module (deg)	0.0
Limit rotation angle?	True
Maximum tracking angle (deg)	45.0
Rated power (kW)	5000.0
Vary reflectivity	True
PV surface material	Smooth glass without ARC

Timezone offset	-7.0
Subtended angle of sun (mrad)	9.3
Peak DNI (W/m <sup>2</sup> )	1000.0
Ocular transmission coefficient	0.5
Pupil diameter (m)	0.002
Eye focal length (m)	0.017
Time interval (min)	1
Correlate slope error with material	False
Slope error (mrad)	10.0

## Flight path parameters

Direction (deg)	159.94
Glide slope (deg)	3.0
Consider pilot visibility from cockpit	False

# PV array vertices

id	Latitude (deg)	Longitude (deg)	Ground Elevation (ft)	Height of panels above ground (ft)	Total elevation (ft)
1	38.5716559845	-104.693312645	5471.92	7.0	5478.92
2	38.570179661	-104.694943428	5496.34	7.0	5503.34
3	38.5685019839	-104.695887566	5515.5	7.0	5522.5
4	38.5651465122	-104.696745872	5513.98	7.0	5520.98
5	38.5625291354	-104.696745872	5519.27	7.0	5526.27
6	38.5626633622	-104.692025185	5505.4	7.0	5512.4
7	38.5625962489	-104.68644619	5489.12	7.0	5496.12
8	38.5558845972	-104.686102867	5470.32	7.0	5477.32
9	38.5558174775	-104.690136909	5496.67	7.0	5503.67
10	38.5518573054	-104.689793587	5476.13	7.0	5483.13
11	38.5524614135	-104.675374031	5456.85	7.0	5463.85
12	38.5526627818	-104.658293724	5341.78	7.0	5348.78
13	38.5526627818	-104.654688835	5341.59	7.0	5348.59
14	38.555683238	-104.655461311	5358.58	7.0	5365.58
15	38.5576968049	-104.658722878	5375.59	7.0	5382.59
16	38.558300864	-104.660868645	5379.33	7.0	5386.33
17	38.5593076178	-104.663443565	5388.72	7.0	5395.72
18	38.5625962489	-104.663786888	5363.87	7.0	5370.87
19	38.5625291354	-104.671511165	5427.96	7.0	5434.96
20	38.5610526245	-104.674086571	5441.48	7.0	5448.48
21	38.5599116634	-104.68018055	5483.89	7.0	5490.89

id	Latitude (deg)	Longitude (deg)	Ground Elevation (ft)	Height of panels above ground (ft)	Total elevation (ft)
22	38.5599787793	-104.682154655	5492.73	7.0	5499.73
23	38.5713875643	-104.681982994	5451.43	7.0	5458.43
24	38.5713875643	-104.684729576	5464.65	7.0	5471.65
25	38.564206952	-104.687905312	5499.01	7.0	5506.01
26	38.564206952	-104.691252708	5495.96	7.0	5502.96
27	38.5723270305	-104.691510201	5459.83	7.0	5466.83

## Flight Path Observation Points

	Latitude (deg)	Longitude (deg)	Ground Elevation (ft)	Eye-level height above ground (ft)	Glare?
Threshold	38.5433321269	-104.504957199	5147.91	50.0	No
1/4 mi	38.5467266389	-104.50654385	5157.94	109.15	No
1/2 mi	38.5501211509	-104.508130501	5166.84	169.44	No
3/4 mi	38.5535156628	-104.509717151	5177.21	228.24	No
1 mi	38.5569101748	-104.511303802	5167.8	306.82	No
1 1/4 mi	38.5603046868	-104.512890453	5189.91	353.9	No
1 1/2 mi	38.5636991988	-104.514477104	5204.66	408.32	No
1 3/4 mi	38.5670937107	-104.516063754	5215.57	466.6	No
2 mi	38.5704882227	-104.517650405	5223.75	527.59	No

No glare found.