East Point Energy Center Project

East Point Energy Center, LLC
Schoharie County, New York

Glint & Glare Analysis

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Summary

East Point Energy Center, LLC is proposing to construct solar arrays near Sharon Airport (K31) in Schoharie County, New York (***Figure 1***). On behalf of East Point Energy Center, LLC, Capitol Airspace performed a Glint and Glare Analysis utilizing the Solar Glare Hazard Analysis Tool (SGHAT) in order to identify any potential impacts on Sharon Airport operations. Specifically, this analysis considered the impact on aircraft approaching to land Runways 13/31. Since Sharon Airport is an uncontrolled airport, this analysis did not consider the potential for impact on air traffic personnel. Additionally, this analysis considered impact on vehicles and residences on Routes 1, 2, 3, 4, 5, and 6.

The results of the study show that acceptable green glare is predicted from solar Array G for aircraft making approaches to Runway 31. These results for Sharon Airport conform to, and are in accordance with, the FAA's interim policy for Solar Energy System Projects on Federally Obligated Airports.

There was also no predicted glare for cars with an estimated viewing height of 4 feet or for large trucks with an estimated viewing height of 8 feet. There is predicted glare for one of the residences with an estimated single story viewing height of 8 feet and for three of the residences with an estimated second story viewing height of 16 feet. In these areas of predicted glare, East Point Energy Center, LLC is proposing landscape buffers to mitigate identified impacts. East Point Energy Center, LLC is proposing to plant landscape buffers as a means to mitigate identified impacts.

Figure 1: Location of East Point Energy Center solar project in proximity to Sharon Airport

Methodology

The results of this analysis conform to, and are in accordance with, the FAA's interim policy for Solar Energy System Projects on Federally Obligated Airports.[1] The FAA adopted this interim policy in order to enhance safety by providing standards for measuring ocular impact of proposed solar energy systems on pilots and air traffic controllers. In cooperation with the Department of Energy (DOE), the FAA developed and validated the Sandia National Laboratories' "*Solar Glare Hazard Analysis Tool*" (SGHAT), now licensed through ForgeSolar. The FAA requires the use of the SGHAT to demonstrate compliance with the standards for measuring ocular impact.

In order for the FAA to approve a revised airport layout plan depicting a solar installation and/or issue a determination of no hazard, the airport sponsor is required to show that the solar installation meets the standards set forth in the interim policy. The interim policy states that a project:

1. Must not have a potential for glint or glare in the existing or planned ATCT cab, (Green, Yellow, or Red) and
2. Must not have a potential for glare (Yellow or Red) along the final approach path for any existing landing threshold or future landing thresholds (including any planned interim phases of the landing thresholds) as shown on the current FAA-approved Airport Layout Plan (ALP). An airport may have a "low potential for after image" (Green) within these areas. The final approach path is defined as two (2) miles from fifty (50) feet above the landing threshold using a standard three (3) degree glidepath.
3. Ocular impact must be analyzed over the entire calendar year in one (1) minute intervals from when the sun rises above the horizon until the sun sets below the horizon.

SGHAT Assumptions:

1. Times associated with glare are denoted in Standard time. For Daylight Savings, add one hour.
2. Glare analyses do not account for physical obstructions between reflectors and receptors. This includes buildings, tree cover, and geographic obstructions.
3. The glare hazard determination relies on several approximations including observer eye characteristics, angle of view, and typical blink response time. Actual values may differ.
4. Hazard zone boundaries shown in the Glare Hazard plot are an approximation and visual aid. Actual ocular impact outcomes encompass a continuous, not discrete, spectrum.
5. The glare analysis assumes clear, sunny skies for 365 days of the year and does not take into account meteorological conditions that would nullify predicted glare.

Capitol Airspace utilized the SGHAT based guidance provided in User's Manual v.3. Solar array specifications were provided by East Point Energy Center, LLC. The East Point solar project arrays are single axis solar arrays. Flight path data was developed by reviewing airport's specific operations before entering it into the SGHAT tool. Each flight path has configurable parameters and observation points. One of the configurable inputs allows for limiting the downward and azimuthal angles of view from the flight path to simulate a pilot's view out the window of the cockpit. East Point Energy Center, LLC

[1] 78 FR 63276, 10/23/2013

specified that the analysis be conducted from the FAA's approved default settings in the SGHAT tool which utilizes the view from the pilot's perspective.

Data

Solar Arrays

East Point Energy Center, LLC provided the data for the arrays based on the input parameters defined in the SGHAT User's Manual v.3. East Point Energy Center, LLC also provided specific data for residences to be evaluated based view-shed analysis. As a conservative approach, the analysis was performed accounting for array layouts presented in the Article 10 Application as the "Proposed Layout" and the "Alternate Layout".

The data for the East Point Energy Center arrays are as follows:

Parameter	Value
Axis tracking:	Single-axis rotation
Tracking axis orientation:	180.0°
Tracking axis tilt:	0.0°
Max tracking angle:	60.0°
Resting angle:	5.0°
Panel material:	Smooth glass with AR coating
Reflectivity:	Vary with sun
Slope error:	Correlate with material

Table 1: East Point Energy Center Array A Inputs

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	42.791445	-74.573123	1365.78	13.5	1379.28
2	42.790117	-74.57045	1357.91	13.5	1371.41
3	42.78887	-74.570449	1350.49	13.5	1363.99
4	42.78887	-74.570689	1351.97	13.5	1365.47
5	42.790354	-74.573434	1372.27	13.5	1385.77
6	42.791091	-74.573435	1368.81	13.5	1382.31
7	42.791445	-74.573147	1365.78	13.5	1379.28

Table 2: East Point Energy Center Array A Vertices

Parameter	Value
Axis tracking:	Single-axis rotation
Tracking axis orientation:	180.0°
Tracking axis tilt:	0.0°
Max tracking angle:	60.0°
Resting angle:	5.0°
Panel material:	Smooth glass with AR coating
Reflectivity:	Vary with sun
Slope error:	Correlate with material

Table 3: East Point Energy Center Array B Inputs

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	42.788177	-74.567773	1297.6	13.5	1311.1
2	42.787696	-74.567267	1284.82	13.5	1298.32
3	42.78744	-74.567267	1286.44	13.5	1299.94
4	42.787369	-74.566545	1278.12	13.5	1291.62
5	42.786632	-74.566544	1283.08	13.5	1296.58
6	42.784321	-74.566831	1283.75	13.5	1297.25
7	42.78381	-74.566902	1282.29	13.5	1295.79
8	42.78381	-74.568009	1285.2	13.5	1298.7
9	42.78405	-74.568057	1287.14	13.5	1300.64
10	42.78405	-74.569092	1291.86	13.5	1305.36
11	42.783809	-74.56914	1290.79	13.5	1304.29
12	42.783058	-74.569572	1289.53	13.5	1303.03
13	42.782817	-74.569716	1288.77	13.5	1302.27
14	42.782746	-74.570149	1292.74	13.5	1306.24
15	42.781498	-74.570148	1302.24	13.5	1315.74
16	42.781497	-74.570966	1311.83	13.5	1325.34
17	42.781737	-74.572049	1319.48	13.5	1332.98
18	42.782006	-74.573276	1326.26	13.5	1339.76
19	42.782247	-74.573926	1334.58	13.5	1348.08
20	42.782487	-74.574359	1340.04	13.5	1353.54
21	42.782814	-74.574721	1344.24	13.5	1357.74
22	42.783551	-74.574722	1346.46	13.5	1359.96
23	42.785054	-74.573785	1336.43	13.5	1349.93
24	42.785382	-74.573497	1333.27	13.5	1346.77
25	42.785863	-74.57292	1328.09	13.5	1341.59
26	42.786134	-74.571837	1319.04	13.5	1332.54
27	42.786374	-74.571621	1318.77	13.5	1332.27
28	42.787126	-74.5709	1319.96	13.5	1333.46
29	42.787366	-74.570612	1322.62	13.5	1336.12
30	42.787694	-74.570179	1326.83	13.5	1340.33
31	42.787935	-74.569313	1321.39	13.5	1334.89
32	42.788176	-74.56888	1316.83	13.5	1330.33

Table 4: East Point Energy Center Array B Vertices

Parameter	Value
Axis tracking:	Single-axis rotation
Tracking axis orientation:	180.0°
Tracking axis tilt:	0.0°
Max tracking angle:	60.0°
Resting angle:	5.0°
Panel material:	Smooth glass with AR coating
Reflectivity:	Vary with sun
Slope error:	Correlate with material

Table 5: East Point Energy Center Array C Inputs

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	42.786291	-74.56534	1270.61	13.5	1284.11
2	42.786292	-74.5638	1259.46	13.5	1272.96
3	42.786052	-74.563751	1257.96	13.5	1271.46
4	42.786052	-74.562933	1246.9	13.5	1260.4
5	42.785812	-74.562885	1244.65	13.5	1258.15
6	42.785812	-74.562356	1240.68	13.5	1254.18
7	42.785484	-74.562283	1236.67	13.5	1250.17
8	42.785244	-74.562139	1230.9	13.5	1244.4
9	42.784498	-74.562138	1224.04	13.5	1237.54
10	42.784493	-74.561127	1222.56	13.5	1236.06
11	42.783997	-74.561127	1232.96	13.5	1246.46
12	42.783997	-74.561295	1233.25	13.5	1246.75
13	42.784204	-74.561344	1229.13	13.5	1242.63
14	42.784202	-74.561993	1230.85	13.5	1244.35
15	42.783726	-74.561993	1242.3	13.5	1255.8
16	42.783726	-74.562738	1243.08	13.5	1256.58
17	42.784232	-74.562739	1238.09	13.5	1251.59
18	42.784236	-74.563244	1239.68	13.5	1253.18
19	42.78447	-74.563244	1243.71	13.5	1257.21
20	42.784476	-74.563678	1246.12	13.5	1259.62
21	42.784551	-74.563726	1248.8	13.5	1262.3
22	42.784551	-74.564399	1260.94	13.5	1274.44
23	42.78431	-74.564448	1253.87	13.5	1267.37
24	42.784235	-74.564881	1251.96	13.5	1265.46
25	42.784235	-74.565265	1257.86	13.5	1271.36
26	42.784732	-74.565266	1266.18	13.5	1279.68
27	42.784745	-74.56541	1268.1	13.5	1281.6
28	42.785482	-74.565411	1266.03	13.5	1279.53
29	42.785554	-74.565339	1264.57	13.5	1278.07

Table 6: East Point Energy Center Array C Vertices

Parameter	Value
Axis tracking:	Single-axis rotation
Tracking axis orientation:	180.0°
Tracking axis tilt:	0.0°
Max tracking angle:	60.0°
Resting angle:	5.0°
Panel material:	Smooth glass with AR coating
Reflectivity:	Vary with sun
Slope error:	Correlate with material

Table 7: East Point Energy Center Array D Inputs

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	42.784373	-74.560178	1231.21	13.5	1244.71
2	42.784374	-74.559721	1233.09	13.5	1246.59
3	42.783739	-74.555462	1229.39	13.5	1242.89
4	42.782492	-74.555461	1265.09	13.5	1278.59
5	42.782943	-74.558517	1267.34	13.5	1280.84
6	42.78368	-74.558517	1249	13.5	1262.5
7	42.783866	-74.559672	1246.26	13.5	1259.76
8	42.783877	-74.560178	1242.76	13.5	1256.26

Table 8: East Point Energy Center Array D Vertices

Parameter	Value
Axis tracking:	Single-axis rotation
Tracking axis orientation:	180.0°
Tracking axis tilt:	0.0°
Max tracking angle:	60.0°
Resting angle:	5.0°
Panel material:	Smooth glass with AR coating
Reflectivity:	Vary with sun
Slope error:	Correlate with material

Table 9: East Point Energy Center Array E Inputs

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	42.782644	-74.561255	1274.12	13.5	1287.62
2	42.782226	-74.557621	1286.45	13.5	1299.95
3	42.781488	-74.557621	1292.5	13.5	1306
4	42.781907	-74.561254	1280.26	13.5	1293.76

Table 10: East Point Energy Center Array E Vertices

Parameter	Value
Axis tracking:	Single-axis rotation
Tracking axis orientation:	180.0°
Tracking axis tilt:	3.0°
Max tracking angle:	60.0°
Resting angle:	5.0°
Panel material:	Smooth glass with AR coating
Reflectivity:	Vary with sun
Slope error:	Correlate with material

Table 11: East Point Energy Center Array F Inputs

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	42.775104	-74.556845	1335.42	13.5	1348.92
2	42.775105	-74.55646	1322.23	13.5	1335.73
3	42.774626	-74.55646	1327.02	13.5	1340.52
4	42.774625	-74.55314	1313.03	13.5	1326.53
5	42.774298	-74.55314	1326.37	13.5	1339.87
6	42.774298	-74.552634	1326.34	13.5	1339.84
7	42.774064	-74.552634	1336.63	13.5	1350.13
8	42.774058	-74.551479	1331.33	13.5	1344.83
9	42.773827	-74.551479	1337.76	13.5	1351.26
10	42.773818	-74.550469	1330.12	13.5	1343.62
11	42.773318	-74.550468	1345.54	13.5	1359.05
12	42.773308	-74.549747	1338.93	13.5	1352.43
13	42.772811	-74.549746	1345.43	13.5	1358.93
14	42.772798	-74.54787	1330.42	13.5	1343.92
15	42.77233	-74.547869	1341.03	13.5	1354.53
16	42.772317	-74.546715	1324.92	13.5	1338.42
17	42.77199	-74.546714	1330.48	13.5	1343.98
18	42.77199	-74.545271	1313.77	13.5	1327.27
19	42.770761	-74.54527	1319.02	13.5	1332.52
20	42.770759	-74.543971	1290.41	13.5	1303.91
21	42.769752	-74.54397	1294.14	13.5	1307.64
22	42.769183	-74.544114	1303.78	13.5	1317.28
23	42.769183	-74.544932	1315.4	13.5	1328.9
24	42.768943	-74.54498	1315.06	13.5	1328.56
25	42.768361	-74.545268	1315.6	13.5	1329.1
26	42.76836	-74.546086	1320.44	13.5	1333.94
27	42.768601	-74.546135	1323.08	13.5	1336.58
28	42.7686	-74.547313	1333.81	13.5	1347.31
29	42.76836	-74.547361	1333.38	13.5	1346.88
30	42.76836	-74.547602	1335.86	13.5	1349.36

31	42.768431	-74.547866	1337.77	13.5	1351.27
32	42.76843	-74.54955	1355.56	13.5	1369.06
33	42.768927	-74.549551	1363.03	13.5	1376.53
34	42.76894	-74.551066	1380.1	13.5	1393.6
35	42.769169	-74.551066	1386.69	13.5	1400.19
36	42.76918	-74.551932	1392.8	13.5	1406.31
37	42.769677	-74.551933	1402.79	13.5	1416.29
38	42.769748	-74.552871	1408.22	13.5	1421.73
39	42.769974	-74.552871	1409.12	13.5	1422.62
40	42.769988	-74.553809	1418.04	13.5	1431.55
41	42.770214	-74.553809	1418.79	13.5	1432.3
42	42.770228	-74.554748	1426.24	13.5	1439.74
43	42.770484	-74.554748	1425.92	13.5	1439.42
44	42.770497	-74.555903	1435.81	13.5	1449.31
45	42.770732	-74.555903	1433.34	13.5	1446.85
46	42.770738	-74.556697	1441.82	13.5	1455.32
47	42.771248	-74.556769	1426.68	13.5	1440.18
48	42.771488	-74.556818	1415.71	13.5	1429.21
49	42.771488	-74.557419	1418.52	13.5	1432.02
50	42.771558	-74.557852	1421.78	13.5	1435.28
51	42.771628	-74.558285	1421.65	13.5	1435.15
52	42.772125	-74.558286	1399.63	13.5	1413.13
53	42.772125	-74.557901	1395.72	13.5	1409.22
54	42.772055	-74.557468	1390.89	13.5	1404.4
55	42.771985	-74.557419	1394.91	13.5	1408.41
56	42.771985	-74.55677	1390.87	13.5	1404.37
57	42.772291	-74.55677	1378.32	13.5	1391.82
58	42.772297	-74.557059	1378.64	13.5	1392.14
59	42.772531	-74.557059	1375.89	13.5	1389.39
60	42.772537	-74.557709	1385.19	13.5	1398.69
61	42.772793	-74.557709	1380.75	13.5	1394.25
62	42.772807	-74.558358	1383.33	13.5	1396.83
63	42.773095	-74.558359	1375.54	13.5	1389.04
64	42.773107	-74.559586	1377.37	13.5	1390.87
65	42.774115	-74.559587	1351.48	13.5	1364.98
66	42.774115	-74.558408	1338.52	13.5	1352.02
67	42.774295	-74.55836	1337.29	13.5	1350.79
68	42.774296	-74.556844	1333.24	13.5	1346.74

Table 12: East Point Energy Center Array F Vertices

Parameter	Value
Axis tracking:	Single-axis rotation
Tracking axis orientation:	180.0°
Tracking axis tilt:	5.0°
Max tracking angle:	60.0°
Resting angle:	15.0°
Panel material:	Smooth glass with AR coating
Reflectivity:	Vary with sun
Slope error:	Correlate with material

Table 13: East Point Energy Center Array G Inputs

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	42.771103	-74.571447	1541.43	13.5	1554.93
2	42.771391	-74.570581	1537.11	13.5	1550.61
3	42.771802	-74.569067	1525.79	13.5	1539.29
4	42.771813	-74.567767	1533.46	13.5	1546.96
5	42.771452	-74.567406	1545.05	13.5	1558.55
6	42.771453	-74.565361	1533.25	13.5	1546.75
7	42.771221	-74.565361	1533.73	13.5	1547.23
8	42.771213	-74.564423	1517.4	13.5	1530.91
9	42.770984	-74.564423	1516.09	13.5	1529.59
10	42.770973	-74.563557	1502.61	13.5	1516.11
11	42.770703	-74.563556	1501.96	13.5	1515.46
12	42.770704	-74.562546	1492.21	13.5	1505.71
13	42.770471	-74.562546	1491.2	13.5	1504.7
14	42.770464	-74.561752	1487.05	13.5	1500.55
15	42.769655	-74.561679	1473.55	13.5	1487.05
16	42.769158	-74.561678	1457.41	13.5	1470.91
17	42.769158	-74.561991	1458.09	13.5	1471.59
18	42.769383	-74.561991	1466.5	13.5	1480
19	42.769388	-74.562761	1469.05	13.5	1482.55
20	42.768642	-74.56276	1465.1	13.5	1478.6
21	42.768634	-74.562544	1461.52	13.5	1475.02
22	42.768137	-74.562543	1465.49	13.5	1478.99
23	42.768137	-74.562928	1472.57	13.5	1486.07
24	42.767896	-74.562976	1475.76	13.5	1489.26
25	42.767896	-74.563361	1481.83	13.5	1495.33
26	42.768136	-74.563506	1482.78	13.5	1496.28
27	42.768393	-74.563506	1483.39	13.5	1496.89
28	42.768405	-74.565743	1532.79	13.5	1546.3
29	42.768625	-74.565743	1527.64	13.5	1541.14
30	42.768646	-74.566032	1532.38	13.5	1545.88
31	42.768876	-74.566032	1528.68	13.5	1542.18

32	42.768886	-74.566321	1532.97	13.5	1546.47
33	42.769142	-74.566321	1527.06	13.5	1540.56
34	42.769156	-74.56661	1530.68	13.5	1544.18
35	42.769396	-74.566682	1525.82	13.5	1539.32
36	42.769893	-74.566683	1518.29	13.5	1531.79
37	42.769964	-74.566971	1520.84	13.5	1534.34
38	42.770204	-74.567116	1527.77	13.5	1541.27
39	42.770701	-74.567117	1541.47	13.5	1554.97
40	42.770715	-74.567333	1542.67	13.5	1556.17
41	42.771202	-74.567694	1546.55	13.5	1560.05
42	42.771316	-74.567743	1545.58	13.5	1559.08
43	42.771316	-74.568994	1542.24	13.5	1555.74
44	42.771065	-74.569042	1544.62	13.5	1558.12
45	42.770654	-74.570557	1545.97	13.5	1559.47
46	42.770606	-74.571446	1545.83	13.5	1559.33

Table 14: East Point Energy Center Array G Vertices

Parameter	Value
Axis tracking:	Single-axis rotation
Tracking axis orientation:	180.0°
Tracking axis tilt:	0.0°
Max tracking angle:	60.0°
Resting angle:	5.0°
Panel material:	Smooth glass with AR coating
Reflectivity:	Vary with sun
Slope error:	Correlate with material

Table 15: East Point Energy Center Array P1 Inputs

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	42.765269	-74.587106	1593.21	13.5	1606.71
2	42.767128	-74.576394	1582.33	13.5	1595.83
3	42.765472	-74.575461	1586.22	13.5	1599.73
4	42.765048	-74.576665	1592.19	13.5	1605.69
5	42.764824	-74.576485	1594.27	13.5	1607.77
6	42.764863	-74.576016	1589.52	13.5	1603.02
7	42.763881	-74.574879	1597.67	13.5	1611.17
8	42.761096	-74.584622	1581.68	13.5	1595.18
9	42.760901	-74.585304	1567.83	13.5	1581.33
10	42.760556	-74.586509	1541.91	13.5	1555.41
11	42.763422	-74.588368	1583.84	13.5	1597.34
12	42.764007	-74.586639	1609.2	13.5	1622.7

Table 16: East Point Energy Center Array P1 Vertices

Runways 13/31

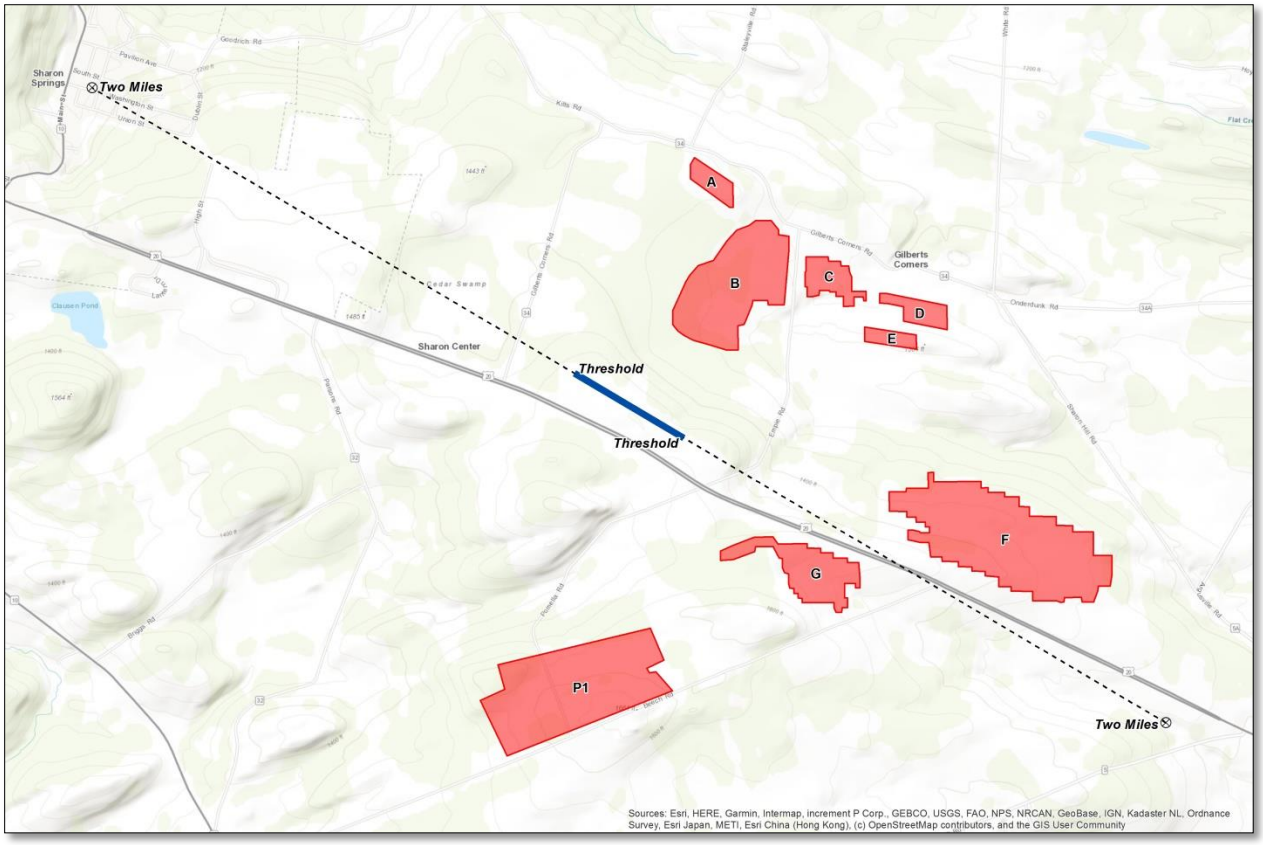

Figure 2: Runways 13/31 SGHAT flight path and East Point Energy Center project

Parameter	Runway 13	Runway 31
Threshold height (ft)	50.0	50.0
Direction (deg)	121	301
Glide slope (deg)	3.0	3.0
Consider pilot visibility from cockpit	Yes	Yes

Table 17: Runways 13/31flight path and viewing parameters

Runway	Observation Point	Latitude	Longitude	Ground Elevation (feet)	Height above ground (feet)	Total Elevation (feet)
13	Threshold	42.780312	-74.581604	1506.96	50	1556.96
	Two-mile	42.795203	-74.61541	1144	966.41	2110.41
31	Threshold	44.120701	-87.680457	649.20	50.00	699.20
	Two-mile	44.092228	-87.673455	610.42	642.23	1252.65

Table 18: Runways 13/31 flight path observation points

East Point Energy Center Discrete Observation Points - Residents

East Point Energy Center, LLC conducted a viewshed analysis through TRC Companies, Inc. to identify all residential receptors with visibility of the project. All residential receptors identified as having visibility of the project were then assessed for glint and/or glare in this analysis.

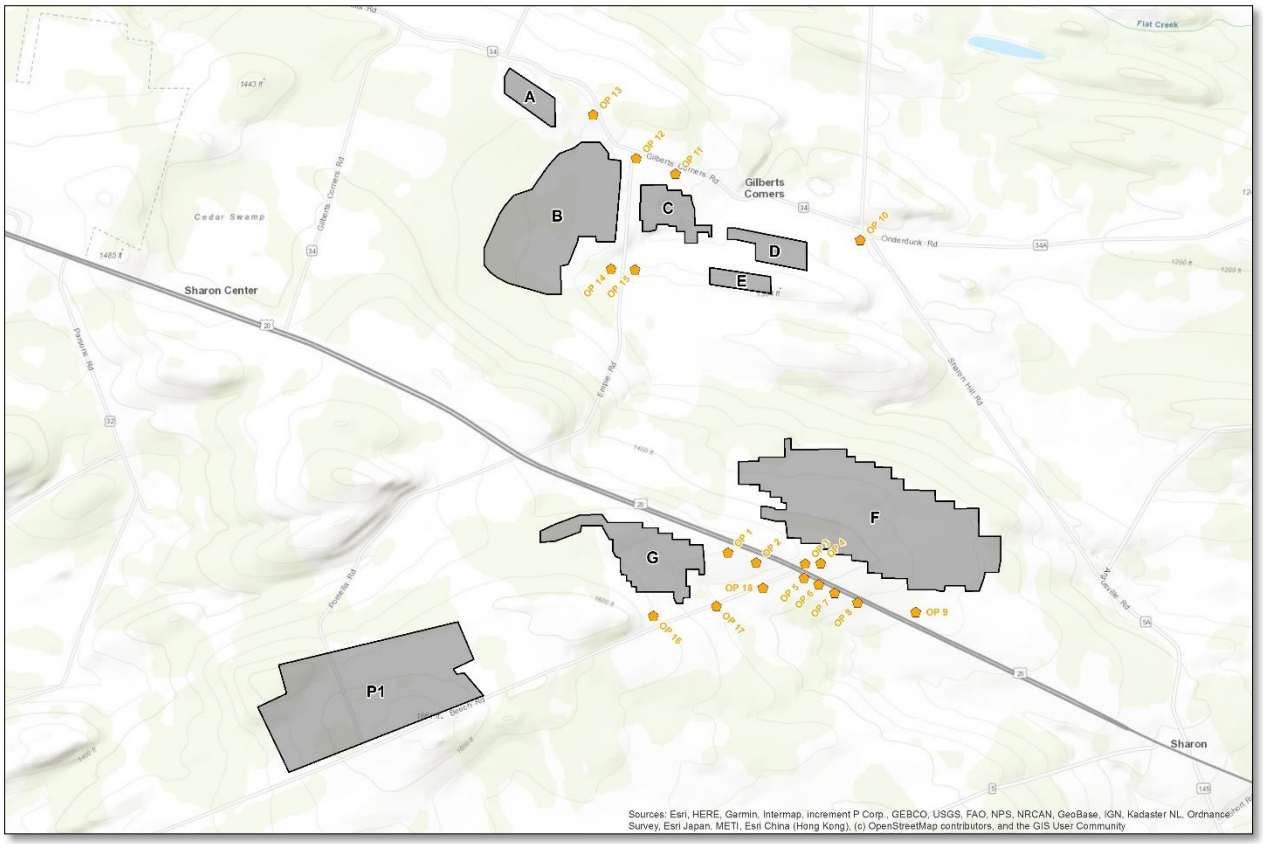

Figure 3: Location of East Point Energy Center Arrays Discrete Observation Points – Residents

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground - Single Story (feet)	Total Elevation - Single Story	Height Above Ground – Second Story (feet)	Total Elevation - Second Story
OP 1	42.770112	-74.560245	1479.59	8	1487.59	16	1495.59
OP 2	42.769663	-74.558555	1452.3	8	1460.3	16	1468.3
OP 3	42.769604	-74.555642	1430.79	8	1438.79	16	1446.79
OP 4	42.769619	-74.554698	1420.69	8	1428.69	16	1436.69
OP 5	42.768981	-74.555712	1418.46	8	1426.46	16	1434.46
OP 6	42.768694	-74.554837	1403.58	8	1411.58	16	1419.58
OP 7	42.768312	-74.553883	1390.88	8	1398.88	16	1406.88
OP 8	42.767871	-74.55252	1364.42	8	1372.42	16	1380.42
OP 9	42.767448	-74.549059	1326.15	8	1334.16	16	1342.16
OP 10	42.783821	-74.552251	1198.95	8	1206.95	16	1214.95
OP 11	42.786775	-74.563253	1259	8	1267	16	1275
OP 12	42.78746	-74.565586	1270.88	8	1278.88	16	1286.88
OP 13	42.789389	-74.568145	1322.96	8	1330.96	16	1338.97
OP 14	42.782617	-74.56713	1277.3	8	1285.3	16	1293.3
OP 15	42.782568	-74.565692	1282.19	8	1290.19	16	1298.19
OP 16	42.767334	-74.564721	1527.82	8	1535.82	16	1543.83
OP 17	42.767751	-74.560955	1442.86	8	1450.86	16	1458.86
OP 18	42.768539	-74.558155	1427.86	8	1435.86	16	1443.86

Table 19: East Point Energy Center Solar Arrays Discrete Observation Receptors

East Point Energy Center Discrete Observation Points - Routes

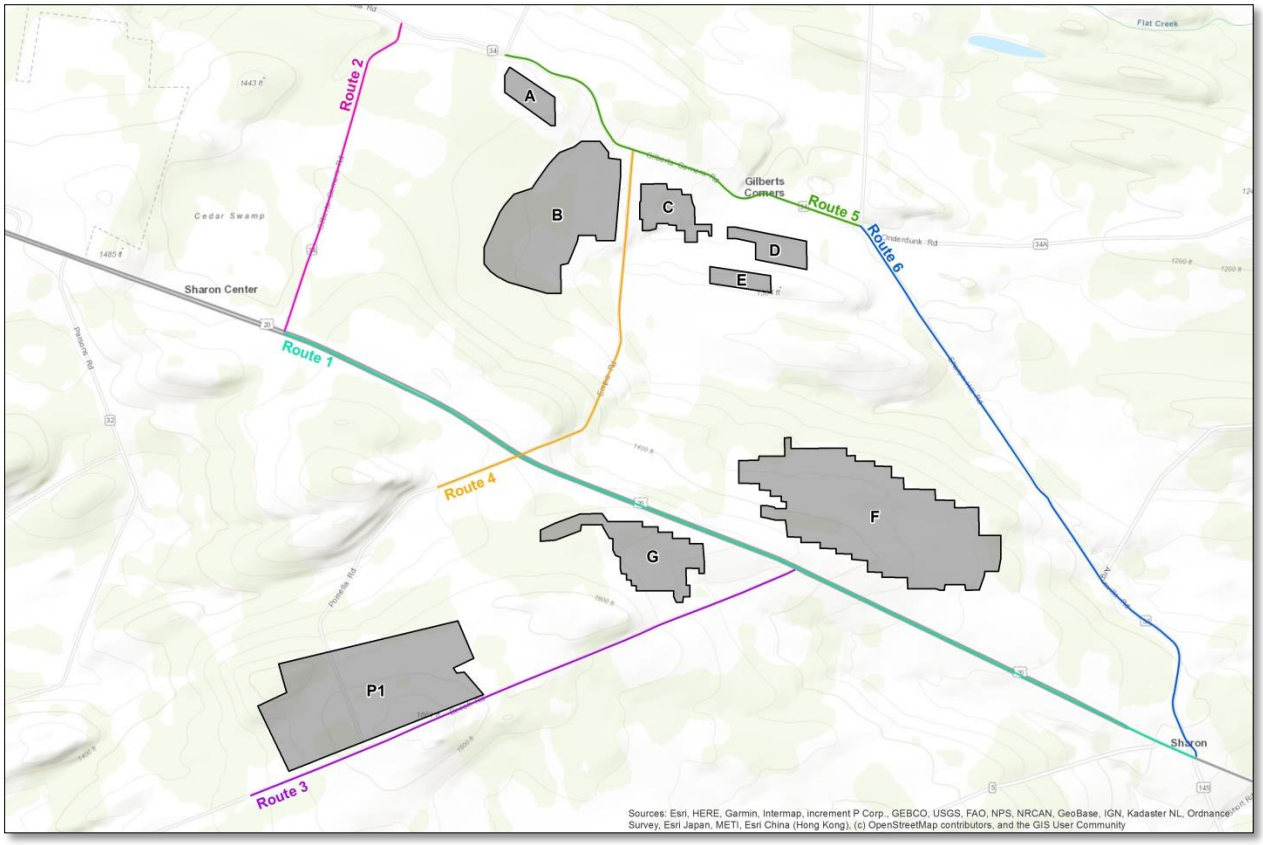

Figure 4: Location of East Point Energy Center Arrays Discrete Observation Points - Routes

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground – Cars (feet)	Total Elevation - Cars	Height Above Ground – Trucks (feet)	Total Elevation - Trucks
1	42.779816	-74.586683	1442.73	4	1446.73	8	1450.73
2	42.779512	-74.585579	1457.92	4	1461.92	8	1465.92
3	42.779184	-74.584497	1480.19	4	1484.19	8	1488.19
4	42.778519	-74.582614	1490.1	4	1494.1	8	1498.1
5	42.776562	-74.577202	1508.4	4	1512.4	8	1516.4
6	42.776121	-74.576229	1513.72	4	1517.72	8	1521.72
7	42.775664	-74.575284	1517.59	4	1521.59	8	1525.59
8	42.774727	-74.573393	1519.42	4	1523.42	8	1527.42
9	42.774443	-74.572787	1514.75	4	1518.75	8	1522.75
10	42.774121	-74.572003	1506.72	4	1510.72	8	1514.72
11	42.773778	-74.571065	1497.75	4	1501.75	8	1505.75
12	42.773282	-74.569369	1480.53	4	1484.53	8	1488.53
13	42.771805	-74.564279	1512.63	4	1516.63	8	1520.63
14	42.770537	-74.559912	1481.96	4	1485.96	8	1489.96
15	42.769931	-74.557823	1454.68	4	1458.68	8	1462.68
16	42.769657	-74.556945	1440.23	4	1444.23	8	1448.23
17	42.769387	-74.556178	1427.74	4	1431.74	8	1435.74
18	42.765141	-74.544322	1290.74	4	1294.74	8	1298.74
19	42.762999	-74.538405	1254.95	4	1258.95	8	1262.95
20	42.761922	-74.535447	1209.81	4	1213.81	8	1217.81
21	42.76092	-74.532457	1180.06	4	1184.06	8	1188.06

Table 20: East Point Energy Center Arrays Observation Receptors Route 1

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground – Cars (feet)	Total Elevation - Cars	Height Above Ground – Trucks (feet)	Total Elevation - Trucks
1	42.779918	-74.58665	1441.1	4	1445.1	8	1449.1
2	42.780234	-74.586498	1439.61	4	1443.61	8	1447.61
3	42.780557	-74.586353	1430.78	4	1434.78	8	1438.78
4	42.781316	-74.586012	1413.8	4	1417.8	8	1421.8
5	42.782819	-74.585317	1410.53	4	1414.53	8	1418.53
6	42.78355	-74.584934	1408.07	4	1412.08	8	1416.08
7	42.78391	-74.584746	1412.24	4	1416.24	8	1420.24
8	42.784281	-74.584567	1407.49	4	1411.49	8	1415.49
9	42.785809	-74.583902	1392.29	4	1396.29	8	1400.29
10	42.78888	-74.582695	1377.21	4	1381.21	8	1385.21
11	42.790412	-74.582101	1389.5	4	1393.5	8	1397.5
12	42.791182	-74.581807	1393.36	4	1397.36	8	1401.36
13	42.791575	-74.58165	1386.32	4	1390.32	8	1394.32
14	42.791732	-74.581575	1386.77	4	1390.77	8	1394.77
15	42.791869	-74.581475	1386.13	4	1390.13	8	1394.13
16	42.791993	-74.581291	1384.39	4	1388.39	8	1392.39
17	42.792097	-74.581092	1380.83	4	1384.83	8	1388.83
18	42.792284	-74.580674	1370.65	4	1374.65	8	1378.65
19	42.792458	-74.580251	1359.56	4	1363.56	8	1367.56
20	42.79255	-74.580041	1351.8	4	1355.8	8	1359.8
21	42.792604	-74.57995	1349.59	4	1353.59	8	1357.59
22	42.792667	-74.57986	1345.03	4	1349.03	8	1353.03
23	42.792753	-74.579792	1341.4	4	1345.4	8	1349.4
24	42.792853	-74.57976	1340.77	4	1344.77	8	1348.77
25	42.793037	-74.579705	1340.17	4	1344.17	8	1348.17
26	42.7934	-74.579573	1317.56	4	1321.56	8	1325.56

Table 21: East Point Energy Center Arrays Observation Receptors Route 2

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground – Cars (feet)	Total Elevation - Cars	Height Above Ground – Trucks (feet)	Total Elevation - Trucks
1	42.759493	-74.588787	1516.15	4	1520.15	8	1524.15
2	42.760678	-74.584702	1586.93	4	1590.93	8	1594.93
3	42.76189	-74.580632	1640.21	4	1644.21	8	1648.21
4	42.762543	-74.578619	1654.57	4	1658.57	8	1662.57
5	42.763177	-74.576598	1651.09	4	1655.09	8	1659.09
6	42.763819	-74.574573	1601.82	4	1605.82	8	1609.82
7	42.764439	-74.572542	1603.04	4	1607.04	8	1611.04
8	42.765633	-74.568475	1601.62	4	1605.62	8	1609.62
9	42.765909	-74.567546	1559.34	4	1563.34	8	1567.34
10	42.766237	-74.566445	1576.39	4	1580.39	8	1584.39
11	42.766556	-74.565427	1552.94	4	1556.94	8	1560.94
12	42.766883	-74.564417	1535.79	4	1539.8	8	1543.8
13	42.767183	-74.5634	1513.04	4	1517.04	8	1521.04
14	42.767465	-74.562382	1479.28	4	1483.28	8	1487.28
15	42.767741	-74.561365	1452.51	4	1456.51	8	1460.51
16	42.768036	-74.560348	1435.8	4	1439.8	8	1443.81
17	42.768333	-74.559324	1428.97	4	1432.97	8	1436.97
18	42.768648	-74.55831	1431.07	4	1435.07	8	1439.07
19	42.768954	-74.557297	1429.29	4	1433.29	8	1437.29
20	42.769115	-74.556789	1426.51	4	1430.51	8	1434.51
21	42.769294	-74.556287	1428.54	4	1432.54	8	1436.54

Table 22: East Point Energy Center Arrays Observation Receptors Route 3

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground – Cars (feet)	Total Elevation - Cars	Height Above Ground – Trucks (feet)	Total Elevation - Trucks
1	42.773011	-74.577528	1490.56	4	1494.56	8	1498.56
2	42.774472	-74.572378	1510.83	4	1514.83	8	1518.83
3	42.774736	-74.571525	1494.68	4	1498.68	8	1502.68
4	42.774975	-74.570656	1487.63	4	1491.63	8	1495.63
5	42.775223	-74.569797	1461.17	4	1465.17	8	1469.17
6	42.775476	-74.568937	1431.81	4	1435.81	8	1439.81
7	42.775689	-74.56869	1424.6	4	1428.6	8	1432.6
8	42.77629	-74.568269	1411.96	4	1415.96	8	1419.96
9	42.777601	-74.567532	1364.43	4	1368.43	8	1372.43
10	42.778786	-74.566824	1314.18	4	1318.18	8	1322.18
11	42.779304	-74.566598	1299.62	4	1303.62	8	1307.62
12	42.779412	-74.566569	1296.87	4	1300.87	8	1304.87
13	42.779674	-74.566593	1288.63	4	1292.63	8	1296.63
14	42.780711	-74.566676	1272	4	1276	8	1280
15	42.780973	-74.566665	1273.22	4	1277.22	8	1281.22
16	42.782617	-74.566432	1282.62	4	1286.62	8	1290.62
17	42.784513	-74.566191	1283.05	4	1287.05	8	1291.05
18	42.786123	-74.566	1283.02	4	1287.02	8	1291.02
19	42.786952	-74.565906	1277.26	4	1281.26	8	1285.26
20	42.78778	-74.565799	1273.83	4	1277.83	8	1281.83

Table 23: East Point Energy Center Arrays Observation Receptors Route 4

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground – Cars (feet)	Total Elevation - Cars	Height Above Ground – Trucks (feet)	Total Elevation - Trucks
1	42.792002	-74.573399	1334.69	4	1338.69	8	1342.69
2	42.791914	-74.572925	1325.85	4	1329.85	8	1333.85
3	42.791817	-74.572179	1323.29	4	1327.29	8	1331.29
4	42.791714	-74.571759	1324.15	4	1328.15	8	1332.15
5	42.791598	-74.571458	1324.32	4	1328.32	8	1332.32
6	42.791424	-74.57114	1327.59	4	1331.59	8	1335.59
7	42.791251	-74.570789	1325.02	4	1329.02	8	1333.02
8	42.791182	-74.570609	1324.99	4	1328.99	8	1332.99
9	42.791126	-74.570378	1320.25	4	1324.25	8	1328.25
10	42.791067	-74.570036	1316.04	4	1320.04	8	1324.04
11	42.790979	-74.56956	1313.61	4	1317.61	8	1321.61
12	42.790883	-74.569201	1304.96	4	1308.97	8	1312.97
13	42.790815	-74.569002	1306.2	4	1310.2	8	1314.2
14	42.790723	-74.568793	1307.5	4	1311.5	8	1315.5
15	42.790565	-74.568526	1306.64	4	1310.64	8	1314.64
16	42.790374	-74.568309	1307.03	4	1311.03	8	1315.03
17	42.790072	-74.568082	1316.11	4	1320.11	8	1324.11
18	42.789888	-74.567984	1319.12	4	1323.12	8	1327.12
19	42.789555	-74.56784	1318.96	4	1322.96	8	1326.96
20	42.789209	-74.567715	1306.88	4	1310.88	8	1314.88
21	42.789037	-74.567636	1304.15	4	1308.15	8	1312.15
22	42.788876	-74.567542	1303.1	4	1307.1	8	1311.1
23	42.788704	-74.567414	1300.62	4	1304.62	8	1308.62
24	42.788184	-74.566963	1284.56	4	1288.56	8	1292.56
25	42.78807	-74.566784	1280.62	4	1284.62	8	1288.62
26	42.787992	-74.566576	1278.01	4	1282.01	8	1286.01
27	42.787172	-74.563233	1264.46	4	1268.46	8	1272.46
28	42.786708	-74.561393	1245.28	4	1249.28	8	1253.28
29	42.786635	-74.561171	1242.15	4	1246.15	8	1250.15
30	42.78654	-74.560968	1239.74	4	1243.74	8	1247.74
31	42.78636	-74.560695	1234.19	4	1238.19	8	1242.19
32	42.786031	-74.560247	1222.28	4	1226.28	8	1230.28
33	42.785851	-74.559959	1217.73	4	1221.73	8	1225.73
34	42.785746	-74.559747	1214.85	4	1218.85	8	1222.85
35	42.785656	-74.559476	1209.5	4	1213.5	8	1217.5
36	42.785619	-74.559204	1211.31	4	1215.31	8	1219.31
37	42.785645	-74.558926	1213.91	4	1217.91	8	1221.92
38	42.785734	-74.558575	1225.58	4	1229.58	8	1233.58

39	42.785809	-74.558246	1228.03	4	1232.03	8	1236.03
40	42.785821	-74.558132	1227.61	4	1231.61	8	1235.61
41	42.785823	-74.557925	1227.18	4	1231.18	8	1235.18
42	42.785782	-74.557668	1227.5	4	1231.5	8	1235.5
43	42.78569	-74.55731	1226.69	4	1230.69	8	1234.69
44	42.78519	-74.555399	1214.77	4	1218.77	8	1222.77
45	42.784876	-74.554164	1206.43	4	1210.43	8	1214.43
46	42.784394	-74.552316	1200.38	4	1204.38	8	1208.38

Table 24: East Point Energy Center Arrays Observation Receptors Route 5

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground – Cars (feet)	Total Elevation - Cars	Height Above Ground – Trucks (feet)	Total Elevation - Trucks
1	42.7844	-74.552236	1200.43	4	1204.43	8	1208.43
2	42.783967	-74.551774	1197.87	4	1201.87	8	1205.87
3	42.783542	-74.551403	1195.96	4	1199.96	8	1203.96
4	42.782702	-74.550665	1194.44	4	1198.44	8	1202.44
5	42.781391	-74.549527	1205.44	4	1209.44	8	1213.44
6	42.780514	-74.548789	1204.91	4	1208.91	8	1212.91
7	42.778837	-74.547213	1193.99	4	1197.99	8	1201.99
8	42.777224	-74.545731	1171.68	4	1175.68	8	1179.68
9	42.775303	-74.543965	1173.52	4	1177.52	8	1181.52
10	42.773327	-74.542192	1212.39	4	1216.39	8	1220.39
11	42.772875	-74.541803	1216.34	4	1220.34	8	1224.34
12	42.772668	-74.541563	1213.07	4	1217.07	8	1221.07
13	42.772508	-74.541324	1210.02	4	1214.02	8	1218.03
14	42.772392	-74.541157	1208.3	4	1212.3	8	1216.3
15	42.772018	-74.540903	1209.42	4	1213.42	8	1217.42
16	42.770763	-74.539746	1206.99	4	1210.99	8	1214.99
17	42.768705	-74.537913	1160.42	4	1164.42	8	1168.42
18	42.768477	-74.537626	1159.46	4	1163.46	8	1167.46
19	42.767428	-74.536184	1149.75	4	1153.75	8	1157.75
20	42.767147	-74.535712	1155.84	4	1159.84	8	1163.84
21	42.766905	-74.535218	1167.5	4	1171.5	8	1175.5
22	42.766768	-74.534909	1165.34	4	1169.34	8	1173.34
23	42.766528	-74.534483	1172.01	4	1176.01	8	1180.01
24	42.766117	-74.533833	1181.92	4	1185.92	8	1189.92
25	42.765963	-74.533624	1187.32	4	1191.32	8	1195.32
26	42.765833	-74.533506	1189.7	4	1193.7	8	1197.7
27	42.765763	-74.533456	1194.44	4	1198.44	8	1202.44

28	42.765649	-74.533411	1198.17	4	1202.17	8	1206.17
29	42.765473	-74.533368	1197.7	4	1201.7	8	1205.7
30	42.765243	-74.53335	1201.53	4	1205.53	8	1209.53
31	42.765025	-74.53338	1204.34	4	1208.34	8	1212.34
32	42.764724	-74.533443	1209.3	4	1213.3	8	1217.3
33	42.763808	-74.533656	1218.41	4	1222.41	8	1226.41
34	42.763351	-74.53375	1218	4	1222	8	1226
35	42.763211	-74.533757	1213.46	4	1217.46	8	1221.46
36	42.762867	-74.533648	1204.11	4	1208.11	8	1212.11
37	42.761874	-74.533095	1188.65	4	1192.65	8	1196.65
38	42.761751	-74.533002	1186.21	4	1190.21	8	1194.21
39	42.761501	-74.532737	1184.68	4	1188.68	8	1192.68
40	42.761309	-74.532504	1182.07	4	1186.07	8	1190.07
41	42.761248	-74.532453	1181.34	4	1185.34	8	1189.34
42	42.761184	-74.532407	1180.9	4	1184.9	8	1188.9
43	42.761094	-74.532387	1180.54	4	1184.54	8	1188.54
44	42.761	-74.532387	1179.71	4	1183.71	8	1187.71

Table 25: East Point Energy Center Arrays Observation Receptors Route 6

Results

Capitol Airspace utilized the above specified inputs to analyze potential glint and glare at various points along the flight paths. Runway end coordinates were obtained from the FAA National Flight Data Center (NFDC) National Airspace System Resources (NASR) dataset. SGHAT uses this information to analyze each flight path between a two-mile final and the runway threshold.

If glare is detected, "Glare Occurrence Plots" are generated by SGHAT. The plots show when glare can occur (as viewed from the prescribed observation point) throughout the year. The color indicates the potential ocular hazard. The colors are defined as:

- Green: Low potential for temporary after-image glare
- Yellow: Potential for temporary after-image glare
- Red: Potential for permanent eye damage glare

The results of this analysis predicted green glare for Runway 31 and yellow glare for three residences (*Table 26*).

Receptor	Green Glare (minutes / year)	Yellow Glare (minutes / year)	Red Glare (minutes / year)
Runway 13	0	0	0
Runway 31	5795	0	0
Residents Single Story	0	50	0
Residents Two Story	0	145	0
Route 1	0	0	0
Route 2	0	0	0
Route 3	0	0	0
Route 4	0	0	0
Route 5	0	0	0
Route 6	0	0	0

Table 26: East Point Energy Center project Glint and Glare summary

Conclusion

The SGHAT analyzed the expected total footprint of the East Point Energy Center project. Findings indicated that no unacceptable glare is predicted from the project arrays for the approaches to Runways 13/31 (*Table 26*). The results also indicate that green acceptable glare is predicted from Array G for approaches to Runway 31 at Sharon Airport. The findings show that the project is compliant with the FAA interim policy for Solar Energy System Projects on Federally Obligated Airports.

The SGHAT findings indicate that there will be yellow glare originating from Array F for three of the studied residences (OP 1, OP 3, and OP 4). OP 1 is expected to observe a predicted 50 minutes of yellow glare per year on the first floor, and 141 minutes of yellow glare per year on the second floor. This glare will be observed between May and August, and is estimated to be fewer than 10 minutes of glare per day. Results further indicate that OP 3 and OP 4 will observe 2 minutes of yellow glare per year on the second floor only. This glare is predicted to occur in in June. No glare was predicted for the remainder of residences identified. .

NOTE: Refer to Exhibit 24: Visual Impacts of East Point Energy Center's Article 10 Application for an assessment of any glare impacts associated with the findings of this Analysis.

The SGHAT findings indicated that there was no predicted glare from the solar arrays along highways used by cars or large trucks. Capitol Airspace has applied FAA's glint and glare standards to vehicular operations due to the absence of non-aviation regulatory guidelines. If you have any questions regarding the findings in this analysis, please contact ***Rick Coles*** at (703) 256-2485.