Attachment F

Glint and Glare Analysis

Excelsior Energy Center

Excelsior Energy Center, LLC

Genesee County, New York

Glint & Glare Analysis

December 15, 2020

Capitol Airspace Group

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Summary

Excelsior Energy Center, LLC is proposing to construct solar arrays near the town of Byron in Genesee County, New York (***Figure 1***). On behalf of Excelsior Energy Center, LLC, Capitol Airspace performed a Glint and Glare Analysis utilizing the Solar Glare Hazard Analysis Tool (SGHAT), in order to identify the potential for glare impacts. Specifically, this analysis considered the potential for glare impacts on nearby residences and roadways.

The results of this analysis indicate that there are no predicted glare occurrences for nearby residences or roadways as a result of the proposed single-axis tracking solar arrays. These results are based on the application of FAA glint and glare standards in the absence of non-aviation regulatory guidelines.

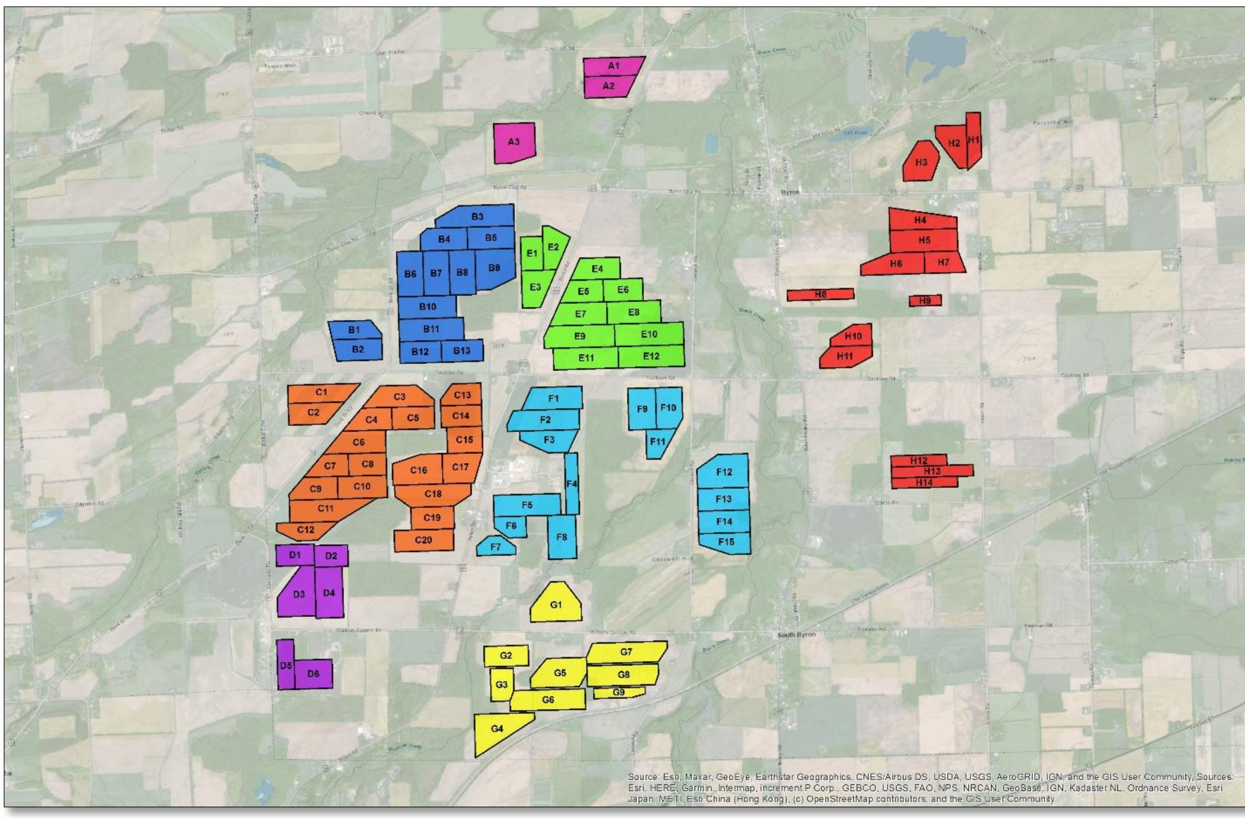

Figure 1: Location and identification of Excelsior Energy Center solar parcels

Methodology

In cooperation with the Department of Energy (DOE), the Federal Aviation Administration (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 in order to enhance safety by providing standards for measuring the ocular impact of proposed solar energy systems on pilots and air traffic controllers. ForgeSolar has enhanced the SGHAT for glare hazard analysis beyond the aviation environment. These enhancements include a route module for analyzing roadways as well as an observation point module for analyzing residences.

The SGHAT analyzes potential for glare over the entire calendar year, in one-minute intervals from when the sun rises above the horizon, until the sun sets below the horizon. The glare hazard determination relies on several approximations including; observer eye characteristics, angle of view, and typical blink response time. The SGHAT does not account for physical obstructions between reflectors and receptors. When glare is found, the SGHAT classifies the ocular impact into three categories:

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

The FAA interim policy for *Solar Energy System Projects on Federally Obligated Airports* requires the absence of red or yellow predicted glare occurrences in the cockpit. Currently, there are no defined standards for acceptable ocular impact on residences or roadways.

Data

Solar array specifications (***Table 1***) as well as location and height information were provided by Excelsior Energy Center, LLC. The SGHAT determines site elevations, unless entered manually.

Table 1: Excelsior Energy Center solar array specifications

Parameter	Value
Axis tracking:	Single-axis rotation
Tracking axis orientation:	180°
Tracking axis tilt:	0°
Max tracking angle:	52°
Resting angle:	10°
Panel material:	Smooth glass with AR coating
Reflectivity:	Vary with sun
Slope error:	Correlate with material

Results

Residences

The SGHAT assessed the potential for glare occurrences at 130 discrete observation point receptors (purple points, ***Figures 2 - 9***). Each observation point was assessed at an 8-foot first story viewing height and a 16-foot second story viewing height. The SGHAT results do not predict glare occurrences for any of the 130 observation points at either viewing height as a result of single-axis tracking arrays.

Routes

The SGHAT assessed the potential for glare occurrences along thirteen route receptors (solid lines, ***Figure 10***). Each roadway was assessed at an 8-foot truck viewing height. The SGHAT results do not predict glare occurrences for any of the roadways at either viewing height as a result of single-axis tracking arrays.

Conclusion

The SGHAT does not predict any glare occurrences for nearby residences as a result of single-axis tracking arrays (***Table 2***). These results are based on the application of FAA glint and glare standards in the absence of non-aviation regulatory guidelines. As noted in the assumptions, this glint and glare analysis takes the most conservative approach and does not consider vegetation, fencing, or other natural obstructions.

Table 2: Annual glare occurrence summary

Receptor	Green Glare (Hours:Minutes)	Yellow Glare (Hours:Minutes)	Red Glare (Hours:Minutes)
Residences (Second Story)	0:00	0:00	0:00
Residences (One Story)	0:00	0:00	0:00
Route 1 Trucks	0:00	0:00	0:00
Route 2 Trucks	0:00	0:00	0:00
Route 3 Trucks	0:00	0:00	0:00
Route 4 Trucks	0:00	0:00	0:00
Route 5 Trucks	0:00	0:00	0:00
Route 6 Trucks	0:00	0:00	0:00
Route 7 Trucks	0:00	0:00	0:00
Route 8 Trucks	0:00	0:00	0:00
Route 9 Trucks	0:00	0:00	0:00
Route 10 Trucks	0:00	0:00	0:00
Route 11 Trucks	0:00	0:00	0:00
Route 12 Trucks	0:00	0:00	0:00
Route 13 Trucks	0:00	0:00	0:00

If you have any questions regarding the findings in this analysis, please contact ***Rick Coles*** at (703) 256-2485.

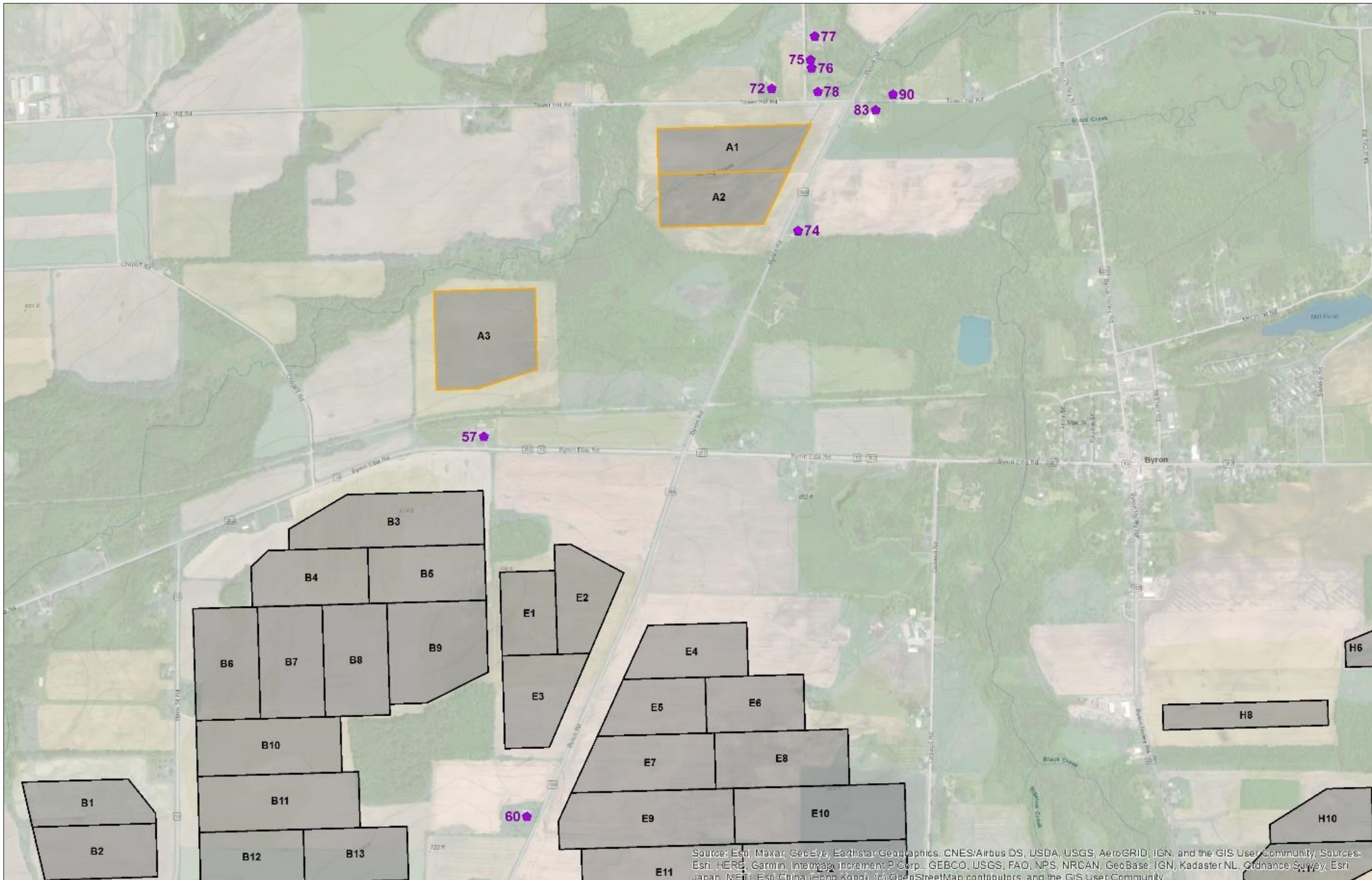

Figure 2: Array A parcels with surrounding discrete observation point receptors (purple points)

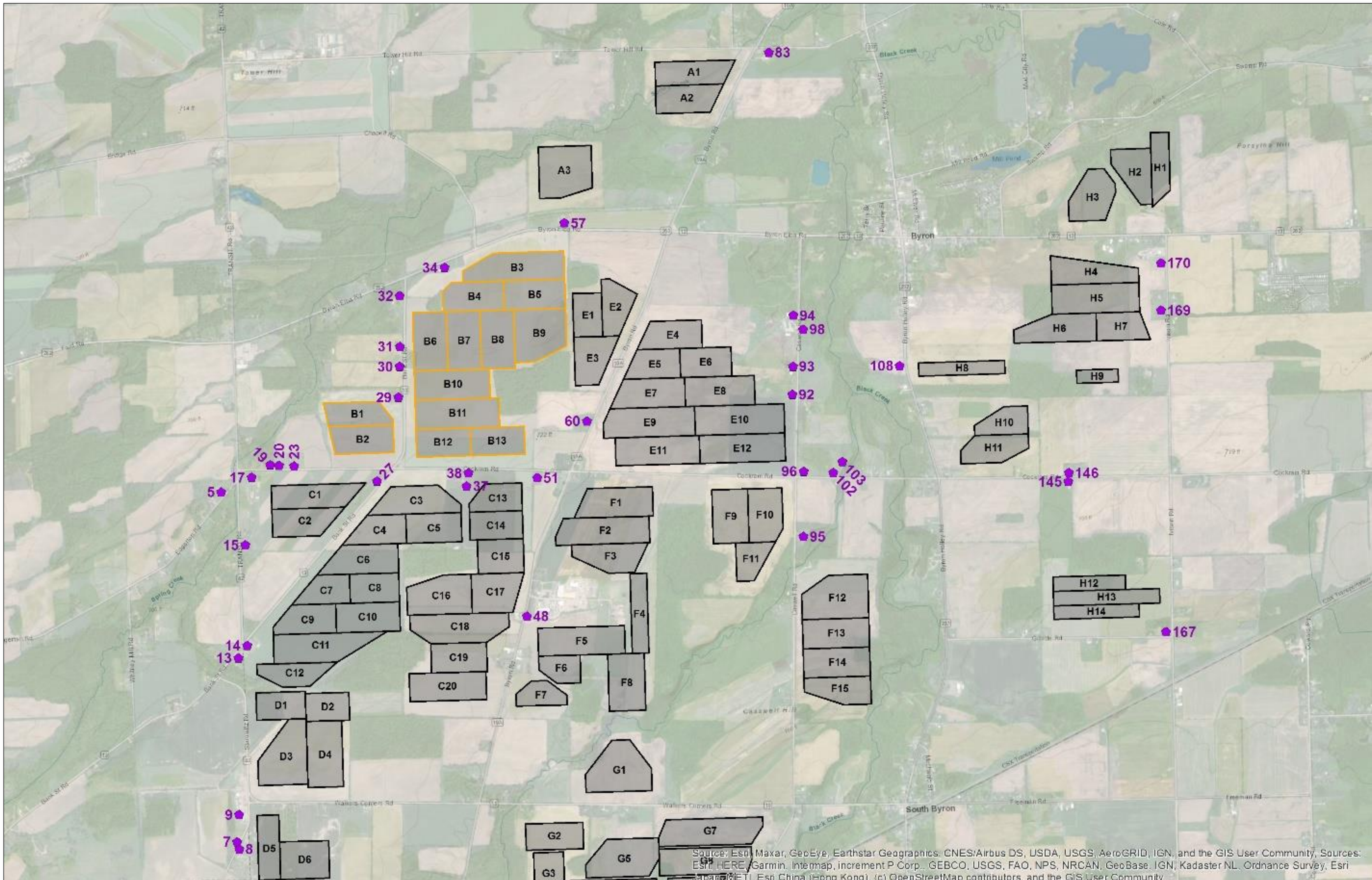

Figure3: Array B parcels with surrounding discrete observation point receptors (purple points)

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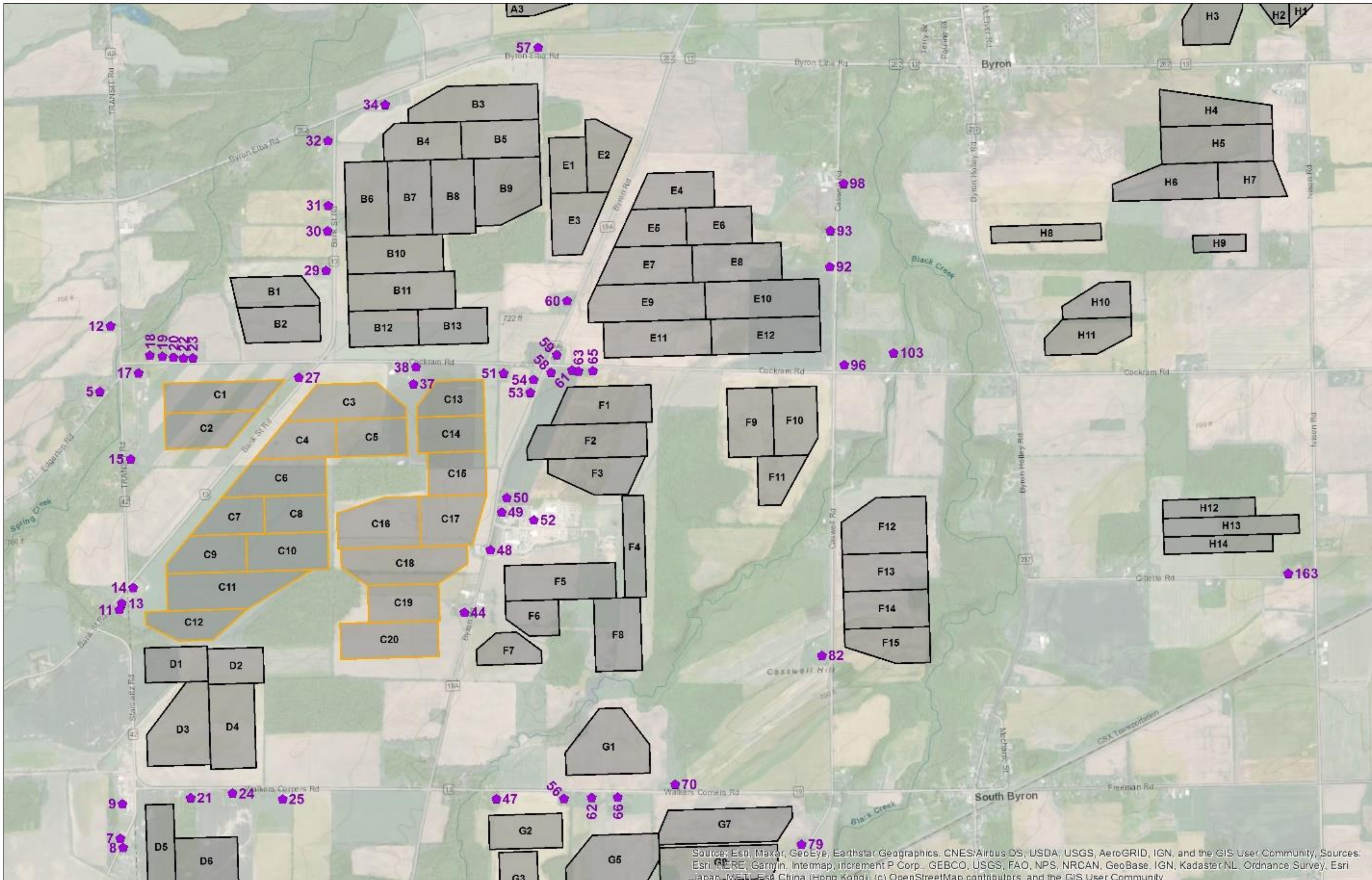

Figure 4: Array C parcels with surrounding discrete observation point receptors (purple points)

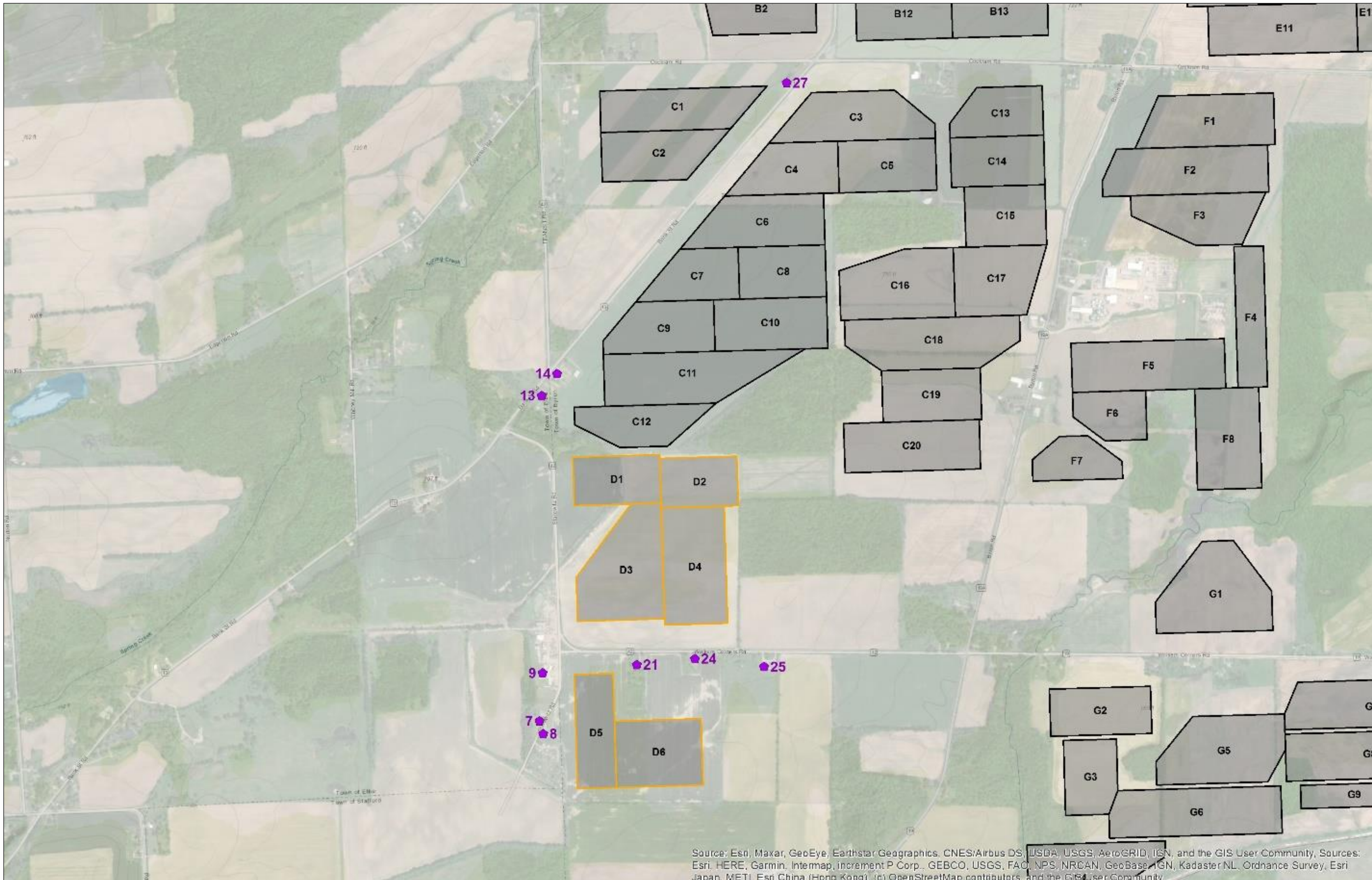

Figure 5: Array D parcels with surrounding discrete observation point receptors (purple points)

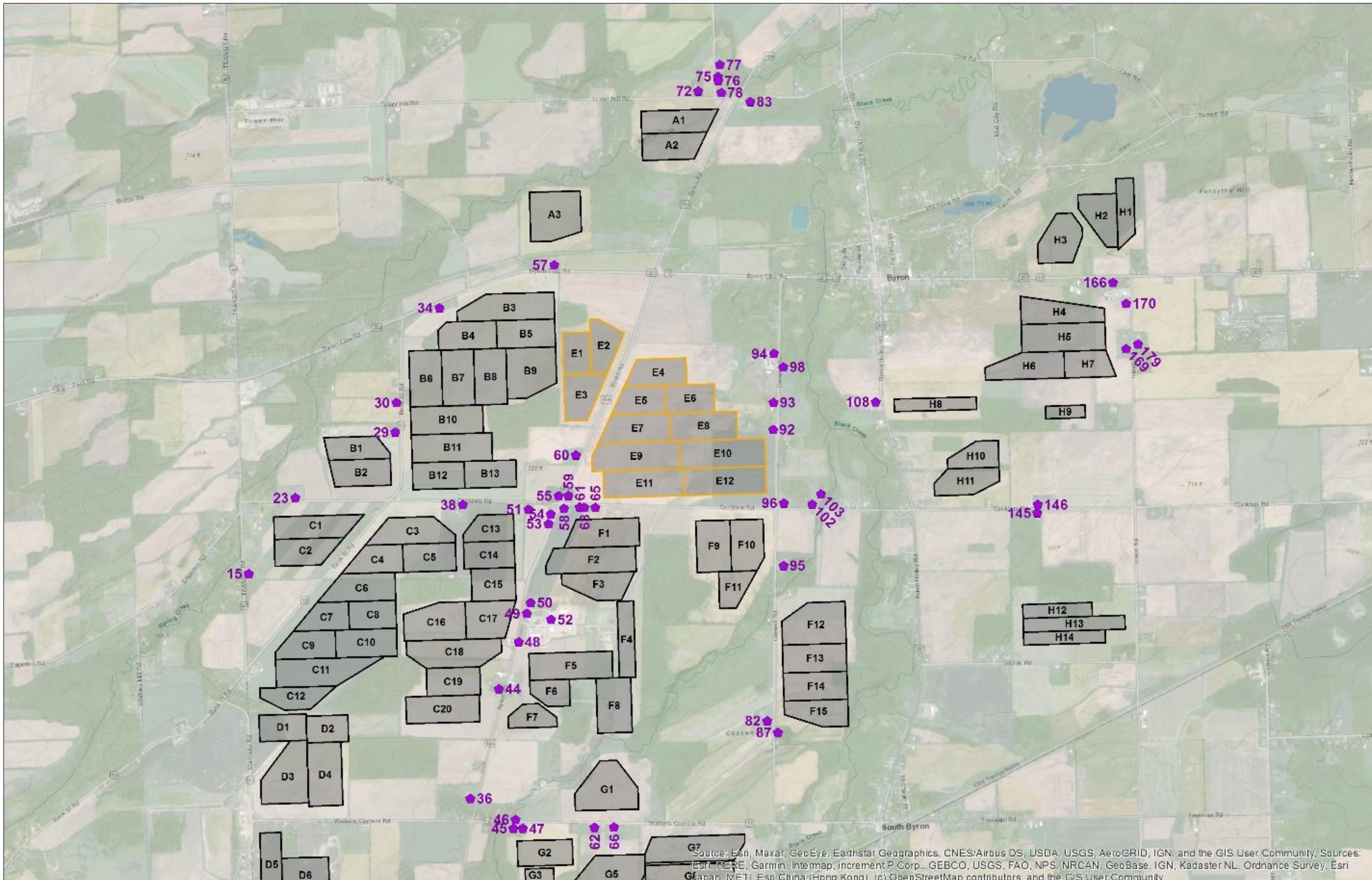

Figure 6: Array E parcels with surrounding discrete observation point receptors (purple points)

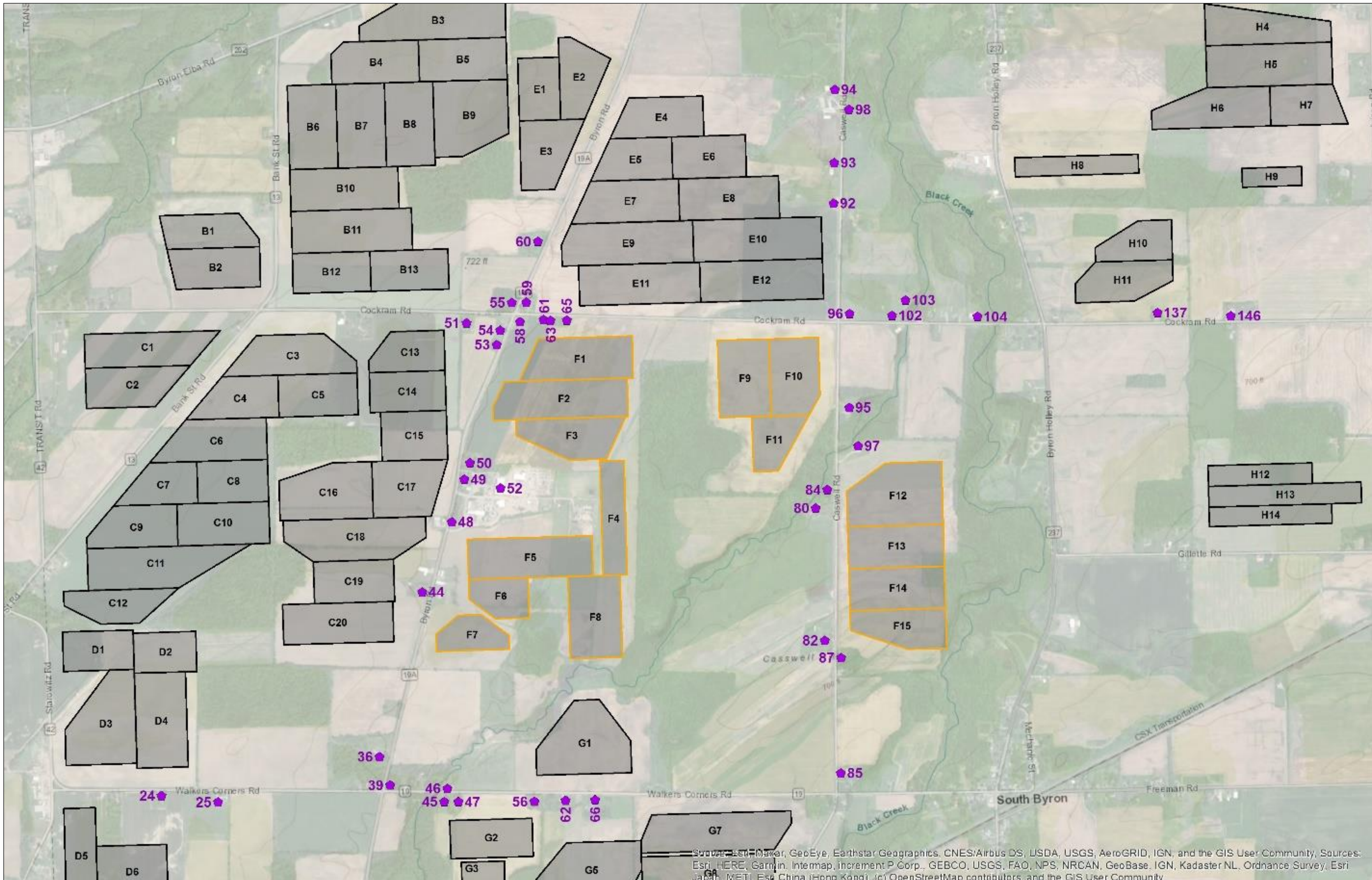

Figure 7: Array F parcels with surrounding discrete observation point receptors (purple points)

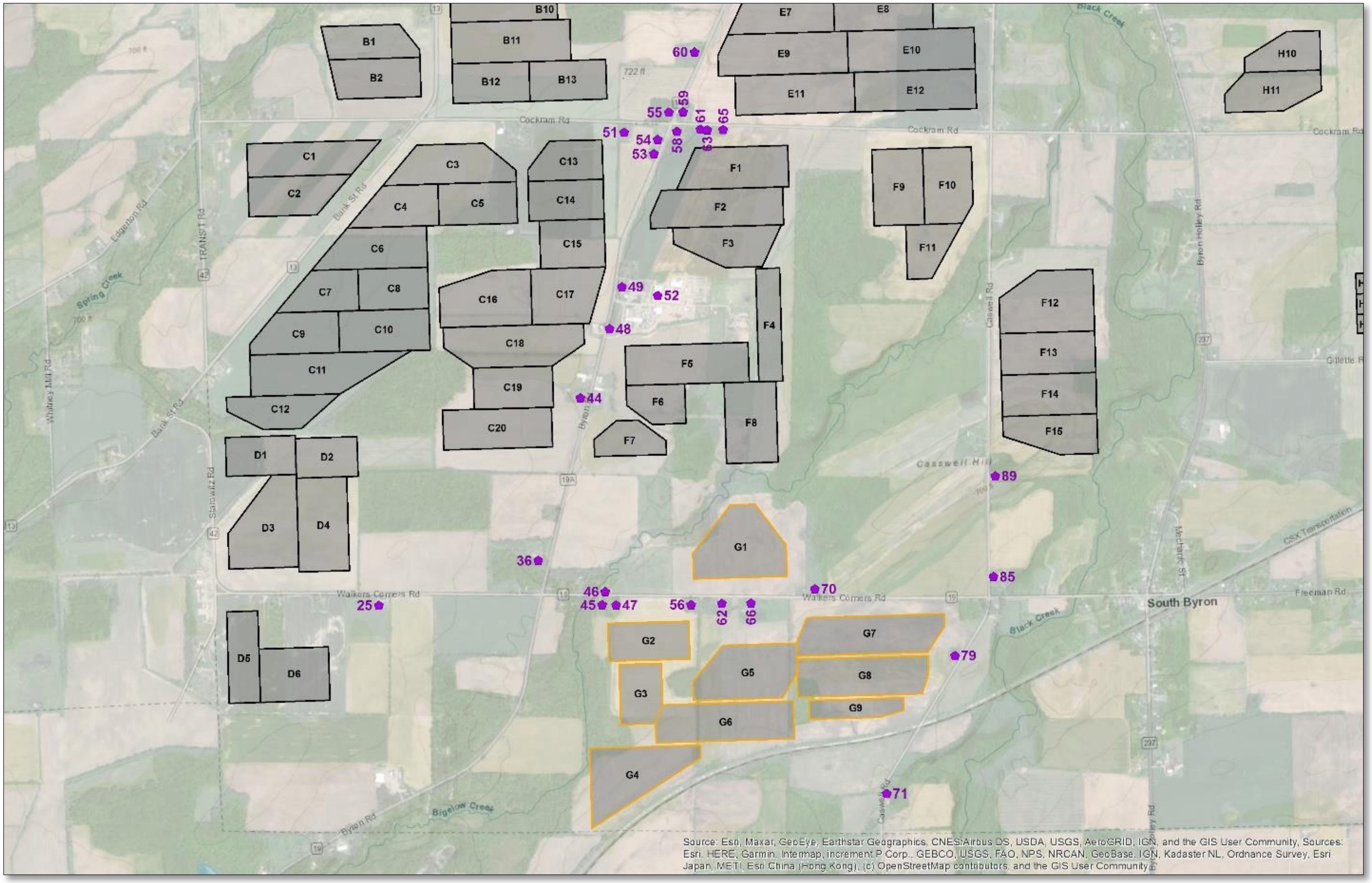

Figure 8: Array G parcels with surrounding discrete observation point receptors (purple points)

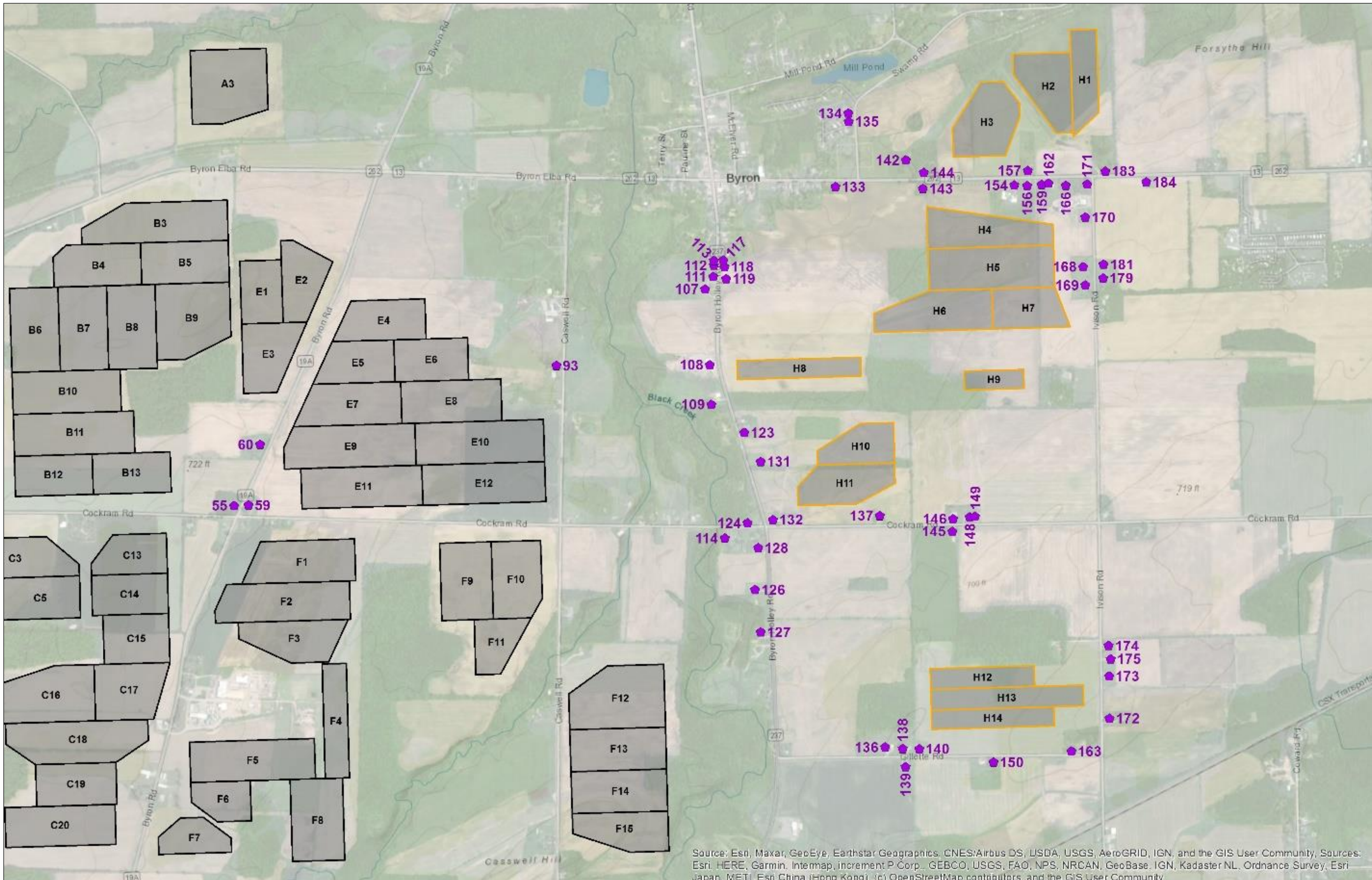

Figure 9: Array H parcels with surrounding discrete observation point receptors (purple points)

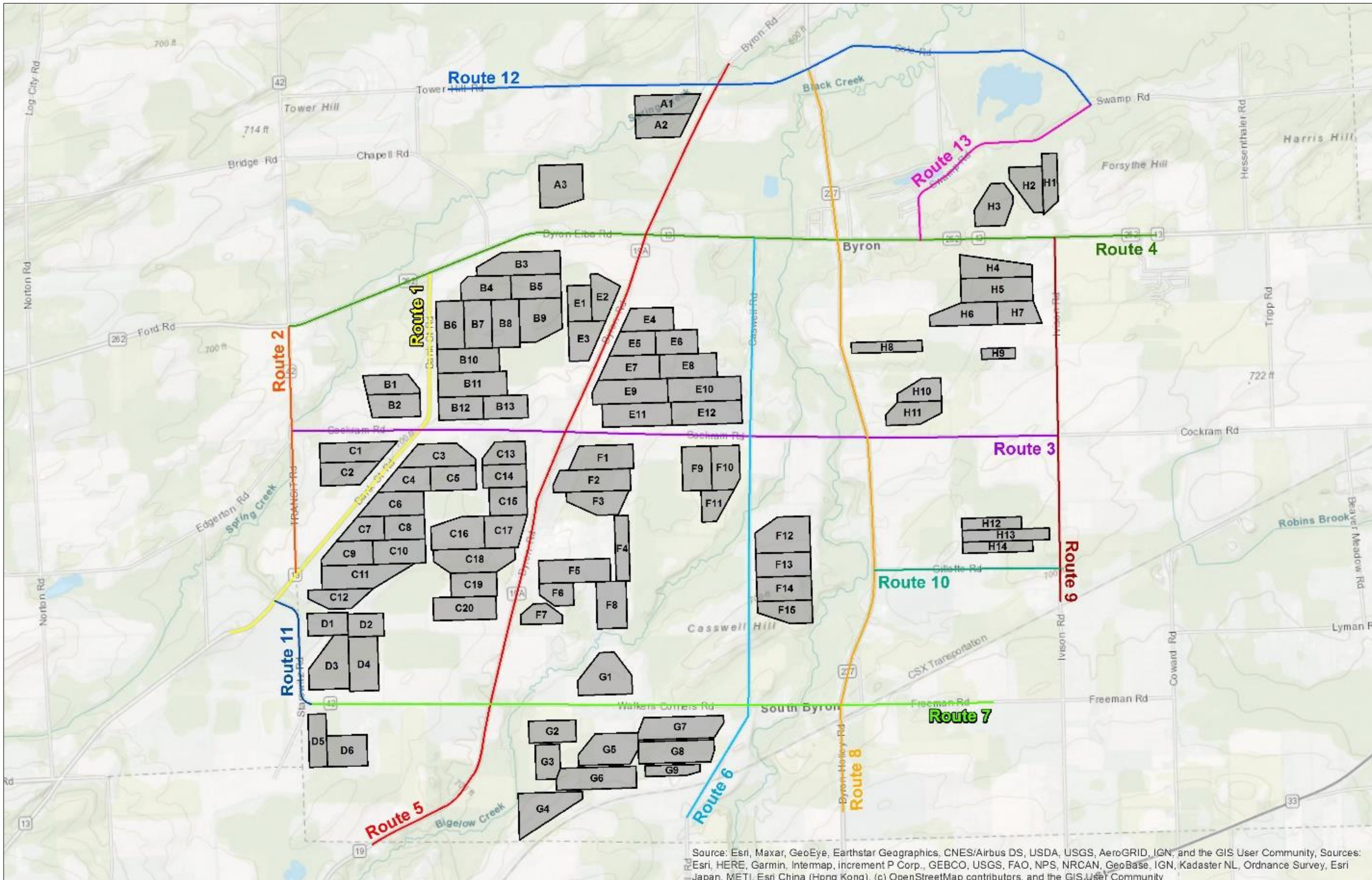

Figure 10: Roadway receptors (solid lines)