

## **2024 Envirothon Special Topic Oral Presentation Scenario**

### **Renewable Energy for a Sustainable Future**

The Greenlane Development Company is building a housing development in rural Sussex County, just south of Seaford. The proposed map of the development is attached. Greenlane is famous for their environmentally friendly housing, and they have already made a commitment to build the first development in Delaware to be entirely powered by renewable energy. Greenlane has approached your team to be the Energy Planning Board for this development. They have asked that you present a proposal detailing how to implement an all-renewable energy plan for this new development.

The development consists of 113 small single-story houses, each with 3 bedrooms. The development is surrounded by tall hardwood trees. Utilities (besides electricity) are supplied by the city of Seaford. A creek runs past the development to the South, with a total flow of about 25 cubic feet/second. The creek empties into the Nanticoke River 3 miles to the West. There is a clubhouse and a small park on the Northern side of the development, and a large open clearing with an area of 2 acres to the Northeast. The land to the West, South, and East of the development is cropland (growing corn and soybeans), and a large chicken farm is located 1 mile down the road to the South, along with housing for the workers. To the North are the cities of Blades and Seaford.

Greenlane would like a rough estimate of the total electrical demand of the development, including all houses, the clubhouse, streetlights, and 30 electric vehicle charging stations. They would also like to see a plan for how to provide this electricity using only, or primarily, renewable sources. While they don't want to change the layout of the development from the provided map, the houses can be built with any reasonable technology installed. The clearing to the Northeast can be used for any purpose. None of the trees surrounding the development can be removed. Greenlane has specifically asked that your group consider the principals of energy diversity, environmental justice, and profitability in your plan. Your group can make any assumptions necessary, as long as they make sense and are specified in your presentation.

