

SUMMARY FOR PUBLIC RELEASE

Project Title: Extremophilic microalgae for economical cultivation in bioplastic manufacturing

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Photosynthex Corporation proposes a three-year project to demonstrate, quantify, and optimize the cultivation of microalgae for sustainable aviation fuel (SAF), bioplastics, and omega-3 fatty acids. The project will build upon the PI's 12+ year large-scale algae farming experience in Imperial, Texas. This location offers advantages due to its brackish groundwater, favorable climate, and existing infrastructure. Key project objectives include optimizing algae cultivation and harvesting methods to maximize biomass yield and minimize costs. This involves developing a halotolerant strain of *Nannochloropsis oceanica* to enhance water recycling efficiency and exploring alternative CO₂ delivery methods, including those relevant for potential future direct air capture technologies. Additionally, the project aims to evaluate and refine crop protection strategies, such as the use of ozone, and optimize nutrient utilization through precise monitoring and supplementation of nitrogen, phosphorus, and iron. On-site biomass processing methods, such as spray drying, will be investigated to reduce transportation costs. Implementing precision agriculture technologies, including drones and remote sensing, will enhance large-scale cultivation efficiency. Finally, a Techno-Economic Analysis (TEA) and Life Cycle Assessment (LCA) will be conducted to assess the feasibility and environmental impact of the project. The project leverages expertise from multiple commercial partners, who will convert all biomass produced in this program into commercial products. This program aims to generate data and best practices for large-scale algae cultivation that can be shared with other growers. The project will also contribute to the development of a regional hub to support the growth of the algae industry in West Texas.