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Dear Dr. Mayfield:

SUBJECT: Economic Impact of Algal Biofuel Research

As requested, the San Diego Association of Governments has estimated the anticipated economic impact of algal biofuel research on the regional economy during the course of one year. This impact analysis is based upon 366 employees engaged in private sector research in algal biofuels and financing for biofuels research, and 100 academic faculty and research assistants, for a total of 466 workers in algal biofuels. The analysis was conducted using the 2009 IMPLAN economic impact model and focuses on the work occurring in San Diego, which is concentrated in research and development. All dollar values are reported in 2011 dollars.

Future production of biofuel from algae has the potential to produce a sustainable and easily produced fuel source for the nation. This may result in advantages such as a cleaner environment, lower fuel costs, and other benefits. Those benefits are in addition to, not included in, the economic impact analysis below.

The analysis describes the direct, indirect, and induced impacts of algal biofuel research on the San Diego region economy. The direct impacts reflect jobs and expenditures that are directly related to research in algal biofuels. The indirect impacts are the numerous business products, materials, and services required and supplied locally to support the direct activities of algal biofuel research. The induced impacts are the local household expenditures of employees involved in the research.

From an economic perspective, based on current funding levels, research in algal biofuels employed 466 workers in San Diego and provided more than \$41.0 million in payroll and \$80.9 million in economic activity for the San Diego region in 2011. Algal biofuels continues to show strong growth in the region, despite the sluggish economy. The number of jobs in 2011 is an increase over the 410 jobs identified in 2010 and is more than double the number of workers (215) in 2009.

The \$80.9 million in economic activity of algal biofuel research supports other local industries. As a result of its day-to-day operations, research in algal biofuels is expected to generate nearly \$12.5 million in annual payroll and approximately \$32.9 million in additional economic activity at other local companies. This \$32.9 million can be considered the result of the goods and services that companies engaged in algal biofuel research purchase from local vendors. The top industries affected by algal biofuel research's business are shown in the table below.

Industry	Jobs Generated
Services to buildings and dwellings	22.7
Real estate	21.7
Employment services	17.7
Food services and drinking places	11.9
Management, scientific, and technical consulting	11.8
Wholesale trade	10.1

Overall, an estimated 219 jobs are generated by the economic activity of companies supporting algal biofuel research.

In addition to these impacts, research in algal biofuels also has an impact on the region through the expenditures of its employees and the employees of local supplier companies. That payroll generates an additional \$43.3 million in economic activity in the region. This induced effect generates 320 jobs and an additional \$14.7 million in payroll for the region. The top industries affected by the expenditures of employees engaged in algal biofuel research are shown in the table below.

Industry	Jobs Generated
Food services and drinking places	37.4
Offices of physicians, dentists, and other healthcare	19.2
Real estate	18.6
Retail - food and beverage	11.1
Private hospitals	10.2
Retail - general merchandise	10.2

A summary of algal biofuel research's impacts is shown below:

	Direct	Indirect	Induced	TOTAL
Employment	466	219	320	1,005
Wages*	\$41,050,000	\$12,488,000	\$14,729,000	\$68,267,000
Output*	\$80,929,000	\$32,883,000	\$43,263,000	\$157,075,000

*rounded to the nearest 100,000

Sincerely,


for BETH JAROSZ
 Senior Economic Analyst

BJA/kca/ais