CALIFORNIA ENERGY COMMISSION

California Energy Commission

Clean Transportation Program

FINAL PROJECT REPORT

Expansion of Existing Biorefinery for Producing Low Carbon Intensity Biodiesel

Prepared for: California Energy Commission

Prepared by: American Biodiesel, Inc. dba Community Fuels

Gavin Newsom, Governor

December 2020 | CEC-600-2020-059

California Energy Commission

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PREFACE

Assembly Bill 118 (Núñez, Chapter 750, Statutes of 2007) created the Clean Transportation Program, formerly known as the Alternative and Renewable Fuel and Vehicle Technology Program. The statute authorizes the California Energy Commission (CEC) to develop and deploy alternative and renewable fuels and advanced transportation technologies to help attain the state's climate change policies. Assembly Bill 8 (Perea, Chapter 401, Statutes of 2013) reauthorizes the Clean Transportation Program through January 1, 2024, and specifies that the CEC allocate up to $20 million per year (or up to 20 percent of each fiscal year's funds) in funding for hydrogen station development until at least 100 stations are operational.

The Clean Transportation Program has an annual budget of about $100 million and provides financial support for projects that:

- Reduce California's use and dependence on petroleum transportation fuels and increase the use of alternative and renewable fuels and advanced vehicle technologies.
- Produce sustainable alternative and renewable low-carbon fuels in California.
- Expand alternative fueling infrastructure and fueling stations.
- Improve the efficiency, performance and market viability of alternative light-, medium-, and heavy-duty vehicle technologies.
- Retrofit medium- and heavy-duty on-road and nonroad vehicle fleets to alternative technologies or fuel use.
- Expand the alternative fueling infrastructure available to existing fleets, public transit, and transportation corridors.
- Establish workforce-training programs and conduct public outreach on the benefits of alternative transportation fuels and vehicle technologies.

To be eligible for funding under the Clean Transportation Program, a project must be consistent with the CEC's annual Clean Transportation Program Investment Plan Update. The CEC issued PON-13-601 to provide funding opportunities for Commercial Scale Advanced Biofuels Production Facilities. In response to PON-13-601, the recipient submitted an application which was proposed for funding in the CEC's notice of proposed awards on November 7, 2013 and the agreement was executed as ARV-13-008 on March 21, 2014.

ABSTRACT

The project involved the expansion of an existing biodiesel production facility at the Port of Stockton from 10 million gallons per year to 15 million gallons per year capacity. The substantial amount of existing infrastructure and equipment at the facility and the flexibility of the original plant design contributed to the project team being able to complete the expansion within twelve months from the grant agreement date.

To expand the production capacity, the project team installed an additional reactor, new process equipment, piping and upgraded a variety of existing piping and ancillary equipment. The project team exceeded the objectives of the project: production flow rates have been demonstrated at 50 gallons per minute, which could support over 25 million gallons per year of biodiesel production. Fuel produced was analyzed to verify that it meets applicable fuel quality specifications including more stringent internal and customer standards. Delivering an additional 15 million gallons of biodiesel per year into California's diesel fuel supply will result in the displacement of 14.1 million gallons of petroleum per year and the associated reduction in greenhouse gas and other harmful emissions.

Keywords: California Energy Commission, American Biodiesel, Inc., Community Fuels, biodiesel, advanced biofuels, biorefinery

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EXECUTIVE SUMMARY

The objective of this project was to expand the production capacity of Community Fuels' existing biodiesel production facility located at the Port of Stockton, to at least 15 million gallons per year. The expansion leveraged the substantial amount of existing infrastructure at the facility and comprised the design, construction, and commissioning of a parallel transesterification reactor line and related augmentations to equipment for raw materials, product purification, and finished good storage. Key aspects of this expansion were included in the original facility design and the newly installed system components were modeled after the existing production process. Also, emphasis was placed on achieving production efficiencies while maintaining the highest degree of product quality.

The objectives of the project were to:

1. Expand Community Fuels' existing biorefinery to increase biodiesel production capacity beyond current levels.
2. Lower the carbon intensity of biodiesel produced at Community Fuels' existing biorefinery.
3. Contribute to petroleum displacement and reduction of green emissions in California.
4. Ensure that all biodiesel produced at the facility meets fuel quality specifications.

The expansion exceeded expectations. Prior to the project, the facility had a maximum production capacity of 10 million gallons per year. After the project, flow rates of 50 gallons per minute have been demonstrated, which could support production of over 25 million gallons per year. Reducing the carbon intensity of biodiesel produced at Community Fuels was achieved by modifying the process with new installations to enable more efficient processing of multiple low-carbon feedstocks. The analytical capabilities of the on-site BQ-9000® laboratory were critical to support the design and commissioning efforts by providing production simulations and in-process analysis. Ultimately, the laboratory also certified that the biodiesel produced met applicable fuel quality specifications including more stringent internal and customer standards. Delivering an additional 15 million gallons of biodiesel per year into California's diesel fuel supply will result in the displacement of 14.1 million gallons of petroleum per year and the associated reduction in greenhouse gas and other harmful emissions.

The results of the project contribute directly towards achieving the key policy objectives set forth in the California Energy Commission's *2012-2013 Investment Plan* which include petroleum displacement, greenhouse gas reduction, increasing alternative and renewable fuel use, and increasing in-state production of renewable low-carbon biofuels.

CHAPTER 1:
Project Overview and Description

1.1 Purpose

Approximately 3.3 billion gallons of diesel fuel were consumed in California in 2010, and demand is forecast to reach 4.1-5.0 billion gallons per year by 2030[1]. Biodiesel (*i.e.,* fatty acid methyl esters produced from vegetable oils and/or animal fats) is a clean-burning, renewable fuel that can be blended at any level with petroleum diesel and used by most diesel engines with few or no modifications. Results from several recent life cycle assessments demonstrate that displacing petroleum diesel with biodiesel reduces greenhouse gas emissions by 65-95 percent[2]. In addition, biodiesel use results is lower emissions of sulfates (100 percent), particulate matter (47 percent), unburned hydrocarbons (67 percent), carbon monoxide (48 percent), polycyclic aromatic hydrocarbon (80 percent) and nitro polycyclic aromatic hydrocarbon (90 percent) relative to petroleum diesel[3]. Biodiesel, therefore, offers California consumers of diesel fuel an immediate and relatively inexpensive means of reducing greenhouse gas and other pollutant emissions in order to attain targeted reduction levels.

Biodiesel may be produced from a wide range of feedstocks (i.e., vegetable oils and/or animals fats) which results in improved sustainability relative to biofuels that are limited to only one feedstock. This feedstock flexibility will contribute towards increased use of biodiesel to sustainably reach anticipated future levels of demand for biofuels. In order to meet the projected demand for biodiesel in California, it will be necessary to increase production from facilities having the equipment and operational expertise to produce biodiesel in commercial-scale volumes from multiple feedstocks while ensuring the quality of the finished fuel.

For this project, Community Fuels will install new equipment to expand its existing biodiesel production facility, located at the Port of Stockton. The expansion will leverage the substantial amount of existing infrastructure at the facility and is expected to increase the production capacity to at least 15 million gallons per year (a 50 percent increase over the existing production capacity of 10 million gallons per year). The project comprises the design, construction, and commissioning of a parallel transesterification reactor line and related augmentations to process equipment and additional storage for feedstock and biodiesel. The newly installed system components will be modeled after the existing production process, which has been proven capable of producing commercial volumes of biodiesel from a variety of feedstocks.

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1 Schremp, G., M. Weng-Gutierrez, R. Eggers, A. Bahreinian, J. Gage, Y. van der Werf, G. Zipay, B. McBride, L. Lawson and G. Yowell, 2011. *Transportation Energy Forecasts and Analyses for the 2011 Integrated Energy Policy Report* (CEC-600-2011-007-SD). Sacramento, CA: California Energy Commission.

2 Wang, M., Huo, H., and S. Arora, 2011, Energy Policy, 39(10), 5726–5736; Pradhan, A., Shrestha, D., Van Gerpen, J., McAloon, A., Yee, W., Haas, M. and J.A. Duffield, 2012, Transactions of the ASABE, 55(6), 2257-2264.

3 U.S. Environmental Protection Agency, 2002. A Comprehensive Analysis of Biodiesel Impacts on Exhaust Emissions*, Draft Technical Report* (EPA420-P-02-001). Washington, DC: Assessment and Standards Division, Office of Transportation and Air Quality, U.S. Environmental Protection Agency.

Emphasis will be placed on maintaining the highest degree of product quality. The existing on-site laboratory will be used to evaluate feedstocks, complete production simulations, support commissioning efforts through in-process testing and analysis and certify that biodiesel meets all applicable fuel quality specifications.

1.2 Objectives

The objectives of the project are to:

- **Expand Community Fuels' existing biorefinery to increase biodiesel production capacity beyond current levels:** Successful implementation of the project is expected to increase the biodiesel production capacity of Community Fuels' existing biorefinery to 15 million gallons per year.
- **Lower the carbon intensity of biodiesel produced at Community Fuels' existing biorefinery:** The expansion will emphasize feedstock flexibility and make it possible to incorporate larger volumes of multiple feedstocks.
- **Contribute to petroleum displacement and reduction of greenhouse gas emissions in California:** Delivering 15 million gallons of biodiesel per year into California's diesel fuel supply will result in the displacement of 14.1 million gallons of petroleum per year and the associated reduction in greenhouse gas and other harmful emissions.
- **Ensure that all biodiesel produced at the facility meets fuel quality specifications:** Ensuring fuel quality is critical to the growth of the biodiesel industry in California and the smooth implementation of the California Low Carbon Fuel Standard.

1.3 Approach

The entity that will own and operate the project is American Biodiesel Inc., which does business as Community Fuels ("Community Fuels" or "Recipient"). Community Fuels is a California C-corporation incorporated in 2004 and headquartered in Encinitas, CA. Community Fuels has extensive experience in the renewable fuels industry and currently operates one of the largest continuously operating biodiesel production facilities in the western United States at the Port of Stockton, CA, shown in Figure 1. The facility occupies a total area of approximately 6 acres and is strategically located in close proximity to existing fuel distribution facilities, major trucking corridors, rail lines (served by two transcontinental railroads -- Union Pacific and Burlington Northern Santa Fe), and marine shipping via the deepwater shipping channel that connects to San Francisco Bay.

Figure 1: Community Fuels Advanced Biorefinery

Source: American Biofuels, Inc.

Community Fuels' biodiesel production facility began production in late 2008 and, prior to completion of this project, had a maximum production capacity of 10 million gallons per year. The proprietary production process is designed to accommodate multiple feedstocks while also enabling high throughput volume and production efficiencies. The process also has robust product separation and purification capabilities that result in exceptional fuel quality.

The existing Community Fuels production facility includes an on-site quality control laboratory which far surpasses industry norms and contributes fundamentally to the exceptional quality assurance and quality control practices necessary for reliably supplying fuel of high quality, shown in Figure 2. The National Biodiesel Accreditation Program is a cooperative and voluntary program for the accreditation of producers and marketers of biodiesel fuel called BQ-9000®. The program is a unique combination of the American Society for Testing and Materials standard for biodiesel and a quality systems program that includes storage, sampling, testing, blending, shipping, distribution, and fuel management practices. The BQ-9000® laboratory certification is for commercial laboratories engaged in the analysis of biodiesel and biodiesel blends. In March 2013, Community Fuels was the first biodiesel producer in the nation to earn BQ9000® Laboratory certification (the Laboratory certification is distinct from BQ9000® Producer certification, which Community Fuels also earned in June 2012).

Figure 2: On-Site BQ-9000 Laboratory

Source: American Biofuels, Inc.

The project will be implemented at Community Fuels' existing biorefinery. While the original construction supported a production capacity of 10 million gallons of biodiesel per year, much of the equipment and infrastructure was purposely oversized to allow for future planned expansions. The project will comprise the design, procurement, installation and commissioning of new process equipment necessary to support higher flow rates throughout the process. A new reactor will be installed in parallel with the existing reactor, which will increase the rate at which feedstock can be processed. Related upgrades and modifications also will be made to existing equipment for product separation and purification and additional tanks will be installed to accommodate increased throughput volumes. Successful implementation of the project is expected to increase the production capacity of the facility to at least 15 million gallons per year.

CHAPTER 2:
Performance of Project Tasks

2.1 Project Administration

This task comprised several activities critical to efficiently planning, implementing, and managing project activities and maintaining open lines of communication with the Commission. The Recipient prepared monthly progress reports and submitted them to the Commission. Each monthly report contained a summary of what the Recipient planned to accomplish during the period, what was actually accomplished during the period, and what the Recipient expected to accomplish during the next period. The reports also contained an update on the status of project milestones and products, a description of any significant problems or changes to the project, a summary of current and cumulative budget expenditures, an invoice narrative, and recent photos from the project site.

The permit for the Recipient's existing facility was issued by the San Joaquin Valley Air Pollution Control District. The Recipient requested a minor modification to the existing air permit to increase the allowed volumes of biodiesel and glycerin. A modified air permit was received from San Joaquin Valley Air Pollution Control District with a new allowed limit of 62,662 gallons of biodiesel and glycerin produced per day which was sufficient to support the expansion project.

2.2 Engineering and Design

This task involved design and engineering to support the timely installation of equipment for expanding the existing biorefinery. This task also included the design and engineering for instrumentation, controls, and piping associated with all of the equipment and other ancillary items.

2.3 Equipment Procurement

The goal of this task was to complete equipment procurement in a manner that minimized lead time for equipment while also meeting all equipment specifications identified during engineering. The Recipient received a notice of proposed grant award on November 7, 2013 with an explanation that the project could be started immediately using only match funds until grant agreements were finalized. The purchase of used equipment was prioritized in order to reduce costs and lead time for the equipment. The project team discussed various options and decided to start work on the project tasks immediately, including equipment procurement, due to the importance of the project and the short timeframe for completion.

2.4 Construction

The goal of this task was to complete all construction-related activities in a safe and efficient manner that would allow demonstration of the higher production rates within 12 months of the grant agreement date. The project team installed and commissioned equipment one piece at a time. By taking this approach, changes to the process line were limited to a single piece of equipment or a single sub-system which greatly simplified the commissioning and integration into production. After each new installation was operational, the process line was run at the higher flow rates in order to stress test all equipment to identify the next slowest section of the process or areas that needed modification. This procedure was repeated with each new installation in order to properly commission the new equipment and to debottleneck the

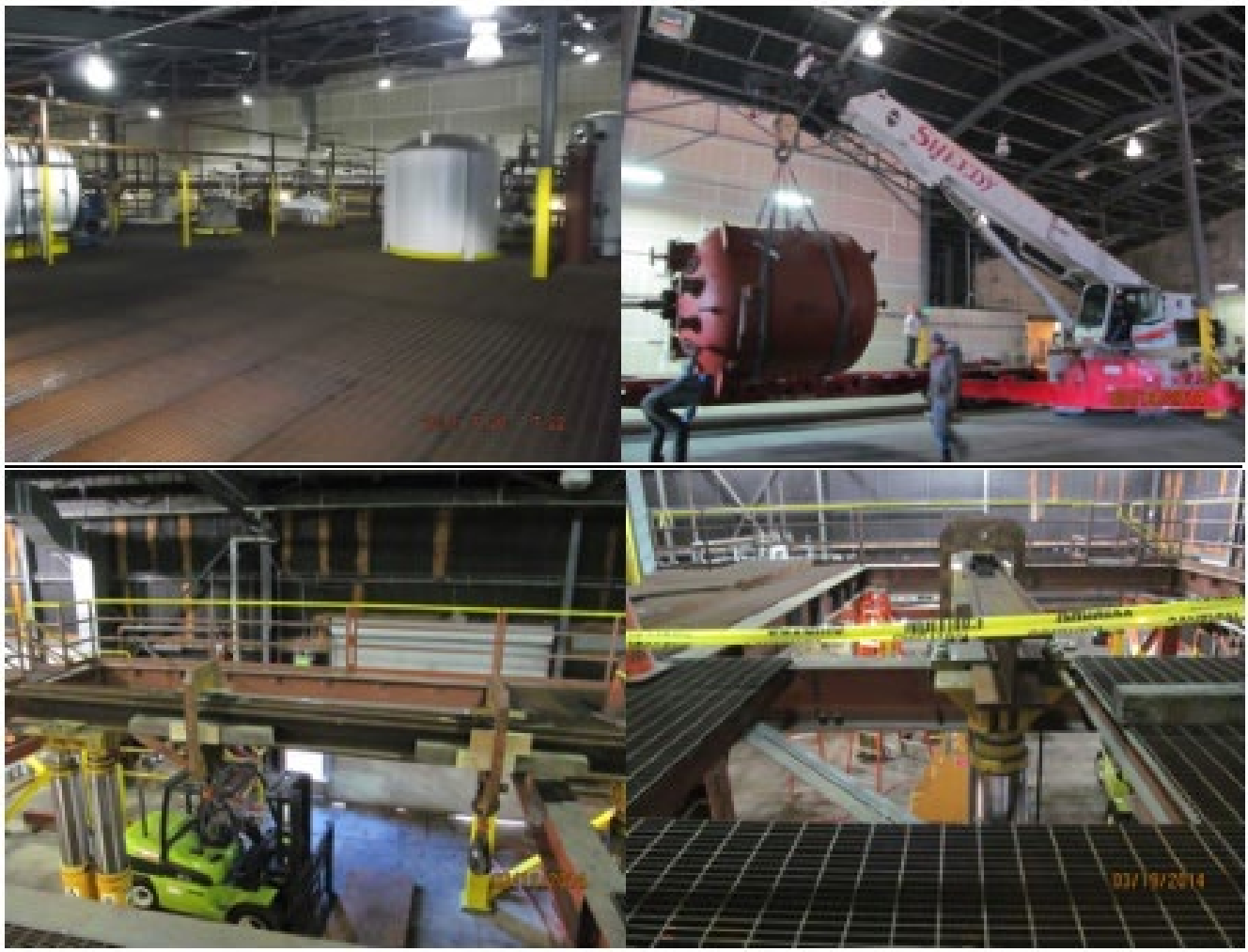
process line in a methodical manner. This incremental approach also reduced the potential of installing unnecessary equipment and allowed the project team to properly prioritize the installations and modifications.

Ancillary equipment was installed with all new equipment. Ancillary equipment may include, but is not limited to, pumps, valves, seals, sight glass, instrumentation, insulation, gauges, meters, and filters. Each installation also required electrical wiring and connections and mechanical installation which included placement, piping and all ancillary equipment installation. After new equipment was installed, programming was completed to enable operation of the equipment through the facility's automated control system.

Key new equipment installations included:

- Reactor: A new reactor was installed in the process room of the existing facility, shown in Figures 3, 4 and 5. This involved cutting through the existing metal decking structure at the facility and using cranes and other heavy equipment to position and secure the reactor. A heat exchanger, piping, insulation and ancillary equipment for the reactor also were installed.

Figure 3: New Reactor Placement and Installation 1



Top Left: Space designated for additional reactor in original biorefinery design. Top Right: Moving reactor after initial preparation work completed. Bottom Left: Preparation of space in the process room. Bottom Right: Preparation of space in the process room

Source: American Biodiesel, Inc.

Figure 4: New Reactor Placement and Installation 2

Top Left: Construction of a temporary dock to support reactor transfer. Top Right: Reactor transfer. Middle Left: Placement of reactor on dock. Middle Right: Reactor placement. Bottom Left: Reactor placed, and piping started. Bottom Right: Reactor placed, and piping started.

Source: American Biodiesel, Inc.

Figure 5: New Reactor Placement and Installation 3

Top Left: Insulation installed on bottom of reactor. Top Right: Insulation installed on top of reactor. Bottom Left: Bottom of reactor fully installed and commissioned. Bottom Right: Top of reactor fully installed and commissioned.

Source: American Biodiesel, Inc.

- Centrifuge: A new centrifuge was installed in the process room of the existing facility, shown in Figure 6.

Figure 6: New Centrifuge Installation

Left: Centrifuge received and prepared for installation. Right: Centrifuge installed in process room and commissioned.

Source: American Biodiesel, Inc.

- Methanol Recovery: Additional process equipment was installed to remove and recover excess methanol, shown in Figure 7. These installations were necessary to increase the capacity of the existing methanol removal system so that it could process the larger post-expansion throughput volumes.

Figure 7: Upgraded Methanol Recovery System

Left: Open area in processing tower prior to installations. Right: Newly installed equipment in processing tower.

Source: American Biodiesel, Inc.

- Heat Exchangers: multiple heat exchangers and coolers were installed to increase the capacity of existing equipment and to support new equipment installations, shown in Figure 8.

Figure 8: Heat Exchangers

Top Left: Fin fan cooler placed in process room. Top Right: Fin fan cooler fully installed and commissioned. Middle Left: Supercharger received and prepared in warehouse. Middle Right: Supercharger installed in process room and commissioned. Bottom Left: Top of heat exchanger prior to piping, insolation and ancillary equipment. Bottom Right: Top of heat exchanger installed and commissioned.

Source: American Biodiesel, Inc.

- Tanks, piping and pumps: 275,000 gallons of additional biodiesel storage and 25,000 gallons of additional feedstock storage were installed, shown in Figure 9. Tank storage is critical at the higher flow rates; without adequate storage the facility cannot reliably operate at the higher rates. Pipe racks, supports and piping were installed to connect new equipment. Also, existing process piping, pumps and filters throughout the facility were upsized as needed to accommodate the higher flowrates.

Figure 9: Tanks

Top Left: Foundations prepared for new tanks. Top Right: Pipe racks and tank supports constructed. Bottom Left: Preparation for tank placement. Bottom Right: Portion of new tanks installed.

Source: American Biodiesel, Inc.

- Nitrogen system: an additional nitrogen generation system was necessary in order to properly blanket all new equipment with nitrogen for safe and compliant operations, shown in Figure 10.

Figure 10: Nitrogen Generation System

Source: American Biodiesel, Inc.

- Instrumentation and controls: the control system automates key aspects of production and was originally designed to accommodate upgrades necessary to support the future expansion of the facility. Extensive programming work was completed to integrate all new equipment into the control system operation.
- Laboratory capabilities: Fourier Transform Near Infrared Spectroscopy capabilities enable in-process testing of key properties to ensure production occurs as expected and to provide an early warning in case key properties are outside of expected ranges. Additional Fourier Transform Near Infrared Spectroscopy probes were installed and the system was programmed to capture new readings to assist with the commissioning and ongoing operation at the higher flow rates. A sulfur analyzer was added to the laboratory to expand the on-site testing capabilities. Additional security cameras were installed to enable monitoring of plant activities

2.5 Commissioning and Training

This task involved the testing of all new installations to ensure proper operation. Once operational parameters were confirmed, applicable standard operating procedures were

prepared and/or updated. Employees were trained on new procedures for safe and compliant operations.

2.6 Data Collection and Analysis

Data collection and analysis occurred throughout the project because process data had to be analyzed in order to prioritize the equipment or process that needed to be modified or upsized to support the higher flow rates. Figure 11 provides an illustration of actual production data with throughput volumes at 47.1 gallons per minute which could support biodiesel production of over 22 million gallons per year. Actual throughput rates of up to 50 gallons per minute have been achieved and the project team will continue efforts to optimize installations and improve efficiencies as an ongoing part of operations.

Figure 11: Sample Throughput Analysis

Community Fuels - sample production throughput analysis

OBS #	Intra-Day Production Reading	Start Date	Start Time	Reactor	Total Production
1	Prod-8916	14-Jan-15	2348	211	3,183.8
2	Prod-8917	15-Jan-15	0051	210	2,507.7
3	Prod-8918	15-Jan-15	0153	211	3,178.4
4	Prod-8919	15-Jan-15	0254	210	2,507.6
5	Prod-8920	15-Jan-15	0346	211	3,190.9
6	Prod-8921	15-Jan-15	0453	210	2,508.9
7	Prod-8922	15-Jan-15	0543	211	3,187.6
8	Prod-8923	15-Jan-15	0646	210	3,107.6
9	Prod-8924	15-Jan-15	0739	211	3,188.2
10	Prod-8925	15-Jan-15	0853	210	2,506.4
11	Prod-8926	15-Jan-15	0959	211	3,188.3
12	Prod-8927	15-Jan-15	1116	210	2,505.4
13	Prod-8928	15-Jan-15	1228	211	3,187.4
14	Prod-8929	15-Jan-15	1336	210	2,506.5
15	Prod-8930	15-Jan-15	1438	211	3,187.6
16	Prod-8931	15-Jan-15	1553	210	2,507.2
17	Prod-8932	15-Jan-15	1702	211	2,739.7
18	Prod-8933	15-Jan-15	1755	210	2,510.1
19	Prod-8934	15-Jan-15	1905	211	3,194.6
20	Prod-8935	15-Jan-15	1954	210	2,509.1
21	Prod-8936	15-Jan-15	2105	211	3,193.4
22	Prod-8937	15-Jan-15	2158	210	2,507.7
23	Prod-8938	15-Jan-15	2309	211	3,188.4
24	Prod-8939	16-Jan-15	0002	210	2,509.1
			Total Production		**68,501.5**
			Minutes of Production		**1,454.0**
			Production Gallons per Minute		**47.1**
			Demonstrated Daily Production Rate		**67,841.9 gallons**
			Daily Rate Annualized		**24,762,288.3 gallons**
			Annualized Biodiesel Throughput (est. at 90%)		**22,286,059.5 gallons**
			Annualized Glycerin Throughput (est. at 10%)		**2,476,228.8 gallons**

Source: American Biodiesel, Inc.

Ongoing production data will be reported to the Commission monthly via California Energy Commission Form M810E or on other forms that may be specified, shown in Figure 12. The Recipient also will be available to respond to questions or to provide supplemental information as requested.

Figure 12: California Energy Commission Form 810E

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California Monthly Bio-Refinery Production & Stock Report
CEC Form M810E
Revised 12-30-2009

Report Period:	January 2015
Company Name:	American Biodiesel, Inc. dba Community Fuels
Company ID Number:	548788000
Bio-Refinery Name:	Community Fuels Stockton Biodiesel Plant
Bio-Refinery Address:	Rough and Ready Island, Port of Stockton, 809-C Snedeker Ave., Stockton, CA 95203

Net Production & Stocks (Thousands of Gallons)

Biofuels Production and Byproduct	Product Code	Production During Month	Stocks at End of Month
Biodiesel (B95-B100)	489		
Glycerol	952		

☑ BQ-9000 Producer

Monthly Feedstock Inputs	Units of Measure	Quantity Received	Origin Location	Mode of Transport	Stocks at End of Month
Oilseeds and Plants (Choose from drop-down list)					
Soy Beans					
Canola Oil					
Corn Oil					
Camelina Oil					
Fats,Oils,Greases and Other (Choose from drop-down list)					
Animal Fat					
Used Cooking Oil					

This report contains proprietary and trade secret information and is customarily treated as confidential by this company. The disclosure of this information would result in competitive hardship. Therefore, pursuant to Public Resources Code sections 25213, 25218(e), 25364 and Title 20, California Code of Regulations, section 1370 our company is requesting that all information submitted on this form be kept confidential. I certify under penalty of perjury that the information contained in this report is true, correct, and complete to the best of my knowledge. I am authorized to make this report on behalf of my company.

Name and Title | Telephone Number

Signature | Date filed

E-mail Address

Source: American Biodiesel, Inc.

Chapter 3:
Achievement of Project Objectives

The objectives of the project were to:

1. Expand Community Fuels' existing biorefinery to increase biodiesel production capacity beyond current levels to a total production capacity of 15 million gallons per year.
2. Lower the carbon intensity of biodiesel produced at Community Fuels' existing biorefinery.
3. Contribute to petroleum displacement and reduction of greenhouse gas emissions in California.
4. Ensure that all biodiesel produced at the facility meets fuel quality specifications.

Production rates prior to the project were a maximum of 20 gallons per minute, which could support up to 10 million gallons per year. The Recipient anticipated that the project would result in an expanded capacity of approximately 15 million gallons per year. Upon completion of the project, actual flow rates of 50 gallons per minute have been demonstrated which could support over 25 million gallons per year of production. The objectives of the project were exceeded significantly with demonstrated production throughput rates more than double the rate anticipated.

- Objective #1 (expanding the operational capacity of Community Fuels' existing biorefinery) was achieved through the design, construction, installation, and commissioning of new process equipment and upsized piping, pumps, filters, etc. As a result of these installations, the production capacity of the biorefinery has been expanded to 50 gallons per minute which could support over 25 million gallons per year of biodiesel production.
- Objective #2 (reducing the carbon intensity of biodiesel produced at Community Fuels' existing biorefinery) and Operational Goal #3 (contributing to petroleum displacement and greenhouse gas emission reduction is California) was achieved by modifying the process with new installations to enable more efficient processing of multiple feedstocks. The biorefinery has the ability to store multiple feedstocks in segregated tanks and continues to process multiple feedstocks. Additional feedstock supplies continue to be identified and integrated into production after the feedstocks are fully evaluated and determined to be in compliance with current Low Carbon Fuel Standard and U.S. Renewable Fuel Standard regulations. Under the re-adopted Low Carbon Fuel Standard now in a proposal stage, the average carbon intensity of Community Fuels biodiesel is expected to be 50 grams of carbon dioxide equivalent per megajoule or lower which is over 50 percent below the expected petroleum diesel carbon intensity value. Delivering an additional 15 million gallons of biodiesel per year into California's diesel fuel supply will result in the displacement of 14.1 million gallons of petroleum per year and the associated reduction in greenhouse gas and other harmful emissions.
- Operational Goal #4 (ensuring that all biodiesel produced at the expanded biorefinery meets fuel quality specifications) was achieved by utilizing Community Fuels on-site BQ-9000® laboratory. Fuel produced was analyzed to verify that it met applicable fuel quality specifications including more stringent internal and customer standards.

The results of the project contribute directly towards achieving the key policy objectives set forth in the California Energy Commission's *2012-2013 Investment Plan* which include petroleum displacement, greenhouse gas reduction, increasing alternative and renewable fuel use, and increasing in-state production of renewable low-carbon biofuels[4].

4 California Energy Commission, 2012. 2012-2013 Investment Plan Update for the Alternative and Renewable Fuel and Vehicle Technology Program (Publication Number: CEC-600-2012-001-LCF). Sacramento, CA: California Energy Commission, Fuels and Transportation Division.

Chapter 4:
Conclusions and Recommendations

The project contributes substantially to the increase of biofuels production within California by introducing over 15 million gallons of new biodiesel production capacity. Community Fuels' biorefinery was specifically designed to accommodate multiple phases of expansion. As market demand for biodiesel grows, the production capacity and processing capabilities of the facility may be expanded further.

Due to California's comprehensive permitting requirements and higher overall operating costs, California biofuel producers can be at a competitive disadvantage relative to producers in other states or countries. In order for Californians to realize the economic benefits of low carbon fuels and the Low Carbon Fuel Standard, it is important to develop in-state production capabilities and to support in-state producers. The Clean Transportation Program has been successful in stimulating the development and expansion of multiple in-state biofuel producers, including Community Fuels.

GLOSSARY

CALIFORNIA ENERGY COMMISSION (CEC)—The state agency established by the Warren-Alquist State Energy Resources Conservation and Development Act in 1974 (Public Resources Code, Sections 25000 et seq.) responsible for energy policy. The CEC's five major areas of responsibilities are:

1. Forecasting future statewide energy needs.
2. Licensing power plants sufficient to meet those needs.
3. Promoting energy conservation and efficiency measures.
4. Developing renewable and alternative energy resources, including providing assistance to develop clean transportation fuels.
5. Planning for and directing state response to energy emergencies.

Funding for the CEC's activities comes from the Energy Resources Program Account, Federal Petroleum Violation Escrow Account, and other sources.