

# California Energy Commission

## STAFF REPORT

# LOCALIZED HEALTH IMPACTS REPORT

Addendum 2 for a Selected Project With a Location Change  
Awarded Funding Through the Alternative and Renewable Fuel  
and Vehicle Technology Program Under Solicitation PON-11-  
601, Biofuels Production Facilities



CALIFORNIA  
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# CALIFORNIA ENERGY COMMISSION

Patrick Brecht  
*Primary Author*

Hieu Nguyen  
*Project Manager*

John P. Butler II  
*Office Manager*  
**EMERGING FUELS AND TECHNOLOGIES  
OFFICE**

Judith Friedman  
*Deputy Director*  
**FUELS AND TRANSPORTATION DIVISION**

Robert P. Oglesby  
*Executive Director*

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## ADDENDUM 2

The *Localized Health Impacts (LHI) Report for Selected Projects Awarded Funding Through the Alternative and Renewable Fuel and Vehicle Technology Program Under Solicitation PON-11-601, Biofuels Production Facilities* was posted April 5, 2012.<sup>1</sup> This addendum applies the same localized health impacts assessment method. SacPort Biofuels has proposed a new site location for the “Renewable Diesel Pilot Project” shown on Table 1. Environmental justice indicators are assessed and represented on Table A-1 of the appendix.

**Table 1: Proposed Site Change for SacPort Biofuels Production Facility**

Original Site Location	Environmental Justice (EJ) <sup>2</sup> Indicators for the Original Location	New Site Location	EJ Indicators for New Location
3225 Industrial Boulevard, West Sacramento, California 95691	Minority, Poverty, Unemployment, and Age	238 California Avenue, Fort Hunter, California 93928	Minority, Poverty, and Unemployment

Source: Energy Commission staff analysis

### SacPort Biofuels

#### Renewable Diesel Pilot Project

##### *New Proposed Site Description*

Fort Hunter Liggett is a U.S. Army garrison located at the southern end of Monterey County that provides training for combat support and combat service support units of the Army Reserve. For both environmental and security reasons, the *U.S. Department of Defense (DoD)*

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<sup>1</sup> Baronas, Jean, 2012. *Localized Health Impacts Report*. California Energy Commission, Fuels and Transportation Division. Publication Number: CEC-600-2012-002.

<sup>2</sup> The EJ indicators follow: (i.) minority subset represents more than 30 percent of a given city’s population (2010), (ii.) city’s poverty exceeds California’s poverty level of 15.9 percent (2009-2013), (iii.) city’s unemployment rate exceeds California’s unemployment rate of 7.0 percent as of December 2014, and (iv.) city’s percentage of persons younger than 5 years of age or older than 65 years of age is 20 percent higher than then California’s average. Note: For the entire state, the percentage of persons under the age of 5 years is 6.8 percent, and the percentage of persons over the age of 65 years is 11.4 percent.

*Strategic Sustainability Performance Plan* sets objectives for the military to provide alternate renewable energy sources, cut greenhouse gas emissions, and reduce solid waste at military facilities. This demonstration project is intended to promote these objectives by converting municipal solid waste (MSW) into renewable diesel and electricity and to verify that the FastOx Pathfinder waste gasification system is a cost-effective, environmentally beneficial way to reduce waste reduction and produce fuel.

The project will be located in a building in the industrial area at the southern end of the base. There are no K-12 schools, day care, or health care facilities within one mile. Military housing is located about 5,000 feet north-northeast of the project site.

### *Potential Impacts*

Sierra Energy, the project recipient's parent company, conducted a computer model for the Monterey Bay Unified Air Pollution Control District. The results of the health risk assessment study demonstrate the emissions of the project will not exceed the Rule 1000 health risk standard of one cancer incidence per 100,000 of exposed population is 0.00001. Specifically, the maximum individual cancer risk (MICR) calculated for the internal combustion (IC) engine and flare combined is 0.000000924. The potential chronic and acute risks are also below the hazard index of 1.0. Specifically, chronic health index (HIC) is 0.133 and the acute health index (HIA) is 0.065.

This project shall result in a net reduction in overall air emissions, as the FastOx gasification system will produce diesel fuel and electricity while significantly reducing or completely eliminating the emissions associated with waste collection and hauling (the vehicular traffic of a round trip of more than 100 miles per collection between Fort Hunter Liggett and Johnson Canyon Landfill, with more than 200 collection trips annually), and the associated waste decomposition emissions in a landfill (which conservatively release around 1 ton carbon dioxide [CO<sub>2</sub>] equivalent per ton of waste).

Diesel produced with this project will be used within the garrison at Fort Hunter Liggett. It will offset the well-to-pump portion of the life cycle of diesel from fossil fuels, eliminating the emissions associated with transporting the fuel from global sources. Pump-to-wheels savings are found in the lower tailpipe emission profile of the ultra-clean, low-sulfur diesel substitute. See Table 2 for estimates of project-generated emissions for the newly proposed location.

**Table 2: Estimate of Project-Generated Emissions for SacPort Biofuels' New Proposed Location Compared to the Original Location**

	Original Location	Original Location	New Location	New Location
Estimate of Project-Generated Emission	<p>The plant (stationary source): Conversion of waste material to Fischer Tropsch<sup>3</sup> (FT)diesel in kg/hour</p> <p>This is based on plant operating at 95% productivity – annual 365,000 gallons per year</p>	<p>Vehicular transportation (mobile source), estimated, to/from project site [kg/day)</p> <p>The emission from vehicular transportation (incoming feedstock and outgoing FT diesel/coproducts) assumes that 6 trucks operated on conventional petroleum diesel and traveling 50 miles/day roundtrip. The calculation of emission reductions assumes 5 mpg (60 gallons) of non-FT diesel used per day to support plant operations</p>	<p>The plant (stationary source): Conversion of FT diesel in kg/hour</p> <p>This is based on plant operating at 95% productivity – annual 365,000 gallons per year</p>	<p>Vehicular transportation (mobile source), estimated, to/from project site (kg/day)</p> <p>The emission from vehicular transportation (incoming feedstock and outgoing FT diesel/co—products) assumes that 2 trucks operated on conventional petroleum diesel and traveling 100 miles/day roundtrip. The calculation of emission reductions assumes 5 mpg (40 gallons) of non-FT diesel used per day to support plant operations</p>
O <sub>3</sub>	Not detectable	Not detectable	Not detectable	Not detectable
CO	0.01333	<del>0.07</del> 1.182	0.01333	0.788
SO <sub>x</sub>	0.0193	<del>0.05</del> 0.003	0.0193	0.002
NO <sub>x</sub>	0.1046	<del>0.309</del> 4.07	0.1046	2.713
PM 10, PM 2.5	0.0121	<del>0.0085</del> 0.157	0.0121	0.1047
ROCs	0.00004	<del>0.0185</del> 0.224	0.00004	0.1493

Note: Original calculations (for the vehicular emissions for the Original Site) were incorrect in the *LHI for Selected Projects Awarded Funding Through the Alternative and Renewable Fuel and Vehicle Technology Program Under PON-11-601, Biofuels Production Facilities*. Data have been replaced.

Source: SacPort Biofuels

<sup>3</sup> The Fischer Tropsch reaction converts a mixture of hydrogen and carbon-monoxide—derived from coal, methane or biomass—to liquid fuels.

The FastOx gasification process planned for this project is a “closed system,” meaning it is an isolated system that has no interaction with the external environment, resulting in nondetectable emissions released in the production of renewable synthetic gas (syngas). The conversion of the syngas into renewable diesel using the Fischer Tropsch (FT) process is also a very clean process with low emissions. The previous table includes conservative estimates of criteria pollutants assuming a worst-case scenario – that all the hydrocarbon-rich “tail gas<sup>4</sup>” from the FT process are sent to the steam isle and used to generate steam; hence, combustion exhaust is shown above. It is likely that any “tail gas” will be sent back to the FastOx gasifier to be thermally reformed into additional syngas for conversion to FT diesel.

The net greenhouse gas (GHG) and net criteria pollutant reductions will increase after Year 1, as the SacPort facility increases production rates beyond the initial 79,000 gallon (FT diesel)/year phase. This project is proposed to be located in an industrial area and is not expected to negatively impact public health of surrounding communities, and the ultra-clean FT diesel produced by the project will help clean the air for communities throughout the region. Table 3 provides the details for the newly proposed location. Table 4 shows reductions in environmental pollutants (annually).

**Table 3: Potential Annual Environmental Reductions Compared With Conventional Diesel Fuels for SacPort Biofuels’ New Proposed Location Compared to the Original Location**

<b>WTW GHG Reductions Using SacPort's FT Diesel, Displacing Other Diesel Fuels</b>							
		<b>[Metric tons(CO<sub>2</sub>e) reduction/annum]</b>					
		Original Location			New Location		
FY	Fuels Produced (gallons/year)	ULSD	FTD	BD	ULSD	FTD	BD
2015	297,000	5,187	1,781	2,233	5,187	1,781	2,233
2016	337,000	5,886	2,021	2,534	5,886	2,021	2,534
2017	357,000	6,235	2,140	2,685	6,235	2,140	2,685
2018	365,000	6,375	2,188	2,745	6,375	2,188	2,745
2019	365,000	6,375	2,188	2,745	6,375	2,188	2,745
2020	365,000	6,375	2,188	2,745	6,375	2,188	2,745

<sup>4</sup> “Tail gas” is a gas produced in a refinery and not required for further processing.

FY	Fuels Produced (gallons/year)	ULSD	FTD	BD	ULSD	FTD	BD
2021	365,000	6,375	2,188	2,745	6,375	2,188	2,745
2022	365,000	6,375	2,188	2,745	6,375	2,188	2,745

Where: WTW = "Well-to-Wheels"  
 ULSD = Ultra-low-sulfur diesel, U.S. average  
 FTD = Fischer-Tropsch Diesel derived from purpose-grown biomass  
 BD = Biodiesel derived from soybean  
 Notes: GHG Well-to-Wheels analysis from GREET Modeling.  
 Source: SacPort Biofuel

**Table 4: Potential Annual Environmental Reductions -- Net Criteria Pollutant Reductions Compared With Conventional Diesel Fuels for the SacPort Biofuels' New Location Compared to the Original Location**

Net Criteria Pollutant Reductions by producing and consuming SacPort FTD, displacing conventional U.S. ULSD											
(kg [criteria pollutants] reduction/year)											
		Original Location					New Location				
FY	Fuels Consumed (gallons/yr)	CO	VOC	NO <sub>x</sub>	PM 10	Total	CO	VOC	NO <sub>x</sub>	PM 10	Total
2015	297,000	939	943	3,715	113	5,710	1,029	943	4,425	195	6,593
2016	337,000	1,065	1,070	4,216	128	6,479	1,168	1,070	5,021	221	7,480
2017	357,000	1,129	1,133	4,466	135	6,863	1,237	1,134	5,319	234	7,924
2018	365,000	1,154	1,159	4,566	138	7,017	1,265	1,159	5,438	239	8,102
2019	365,000	1,154	1,159	4,566	138	7,017	1,265	1,159	5,438	239	8,102
2020	365,000	1,154	1,159	4,566	138	7,017	1,265	1,159	5,438	239	8,102
2021	365,000	1,154	1,159	4,566	138	7,017	1,265	1,159	5,438	239	8,102
2022	365,000	1,154	1,159	4,566	138	7,017	1,265	1,159	5,438	239	8,102

Notes:

Criteria Pollutant reductions from GREET Modeling, combined with actual emissions data from SAE - Technical Paper Series #982526 - "Emissions from Trucks using Fischer-Tropsch Diesel Fuel", 1998

Not including Net SO<sub>x</sub> reductions, as this emissions data was not included in the SAE paper used to calculate criteria pollutants. However, the U.S. ultra-low-sulfur diesel (ULSD) requirement is less than 15 ppm sulfur, whereas the SacPort FTD will contain less than 20 ppb sulfur, therefore reducing tailpipe emissions of SO<sub>x</sub> considerably over conventional ULSD.

Source: SacPort Biofuels

## Summary

The West Sacramento site location has four EJ indicators, and the proposed Fort Hunter site has three, as shown in Table 1. Both locations have nonattainment status for ozone, particulate matter<sup>5</sup> (PM) 2.5, and PM 10. With more than two EJ indicators, the West Sacramento and Fort Hunter sites are both in high-risk communities.

Energy Commission staff concludes that the newly proposed Fort Hunter location is comparable to the original West Sacramento location.

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<sup>5</sup> “Particulate matter” is unburned fuel particles that form smoke or soot and stick to lung tissue when inhaled, and a chief component of exhaust emissions from heavy-duty diesel engines.

# APPENDIX A

**Table A-1: Demographics and Environmental Justice (EJ) Indicators Compared With the State of California** (Yellow highlighted areas indicate numbers that meet the definition for EJ Indicators.)  
Demographic information is based on Monterey County.

	Persons Below Poverty Level (2009-2013)	Black Persons (2010)	American Indian and Alaska Native (2010)	Persons of Hispanic or Latino Origin (2010)	Asian (2010)	Persons Under 5 Years of Age (2010)	Persons Over 65 Years of Age (2010)	Un-employment Rate (December 2014)
<b>California</b>	15.9%	6.2%	1.0%	37.6%	13.0%	6.8%	11.4%	7.0%
<b>California (minorities)</b>		>30.0%	>30.0%	>30.0%	>30.0%			
Fort Hunter (Monterey County)	17.0%	3.6%	2.7%	56.8%	6.9%	7.8%	11.6%	10.7%

Sources: Unemployment information from the State of California, Employee Development Department (EDD) Labor Market Information Division: [http://www.labormarketinfo.edd.ca.gov/CES/Labor\\_Force\\_Unemployment\\_Data\\_for\\_Cities\\_and\\_Census\\_Areas.html](http://www.labormarketinfo.edd.ca.gov/CES/Labor_Force_Unemployment_Data_for_Cities_and_Census_Areas.html) and Demographics information from the U.S. Department of Commerce, U.S. Census Bureau: <http://quickfacts.census.gov/qfd/states/06/0683668.html>