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# environmentalcommons

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Environmental Commons  
South Coast Biodiesel Station  
Feasibility Report, October 2005  
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## I. Background

Biodiesel is quickly becoming a practical alternative to petroleum. It decreases our dependence on foreign oil and produces far fewer greenhouse gas emissions than conventional diesel. Biodiesel is also the only alternative fuel in the US to complete EPA Tier I Health Effects Testing under section 211(b) of the Clean Air Act, which provides the most thorough inventory of environmental and human health effects attributes that current technology will allow<sup>1</sup>. However, many people are still unaware of the option of biodiesel, perhaps because there are not enough biodiesel retail stations to meet the need for this fuel. In Northern California, there are only eleven retail outlets for biodiesel and biodiesel blend.<sup>2</sup> The following report examines the feasibility of establishing a biodiesel station for the south coast of Mendocino County.

Biodiesel is non-toxic and biodegradable. It is an environmentally safe and cost-effective alternative fuel and can be used in all diesel engines with little or no modifications to the engine. Biodiesel is made by reacting oils or fats with alcohol, yielding methyl and ethyl esters for fuel, and generating glycerin as a by-product. Many different complex fatty acids can go through the transesterification process to become biodiesel and glycerin. Early sources of fat were peanut oil, hemp oil, tallow, and corn oil. Presently, soybean oil, canola, recycled fryer oil and forest wastes are popular choices of biofuel sources across the country. California, unfortunately, does not currently grow a biodiesel feedstock, and the state's limited water resources and fragile ecosystem has to be factored in to any decision to grow industrial (oil seed) crops. Post-consumer vegetable oil is the best option, although it has limited availability and the processing of this feedstock into biodiesel is still in the early stages. Biofuel can be used in full strength, which is referred to as B100 (100% pure biodiesel), or it can be blended with petroleum diesel, in which case it is named Bxx, with the xx indicating the amount of biodiesel in the blend, for example, B20 (20% biodiesel, 80% petroleum). Blended biodiesel is cheaper, and is less

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<sup>1</sup> From the Biodiesel Fact Sheet on the National Biodiesel Board web site

<sup>2</sup> From the 21<sup>st</sup> Century Green Alternative Fuel Consultants web site, the 11 retail outlets for biodiesel in Northern California are: BioFuel Oasis in Berkeley; The Biofuel Station in Laytonville; Cross Petroleum in Mt. Shasta; Community Energy Park in Willits; Eel River Fuels in Ukiah; Northstar Gas Station in Truckee; Renner Petroleum in Eureka and Garberville; Mountain Feed and Farm Supply in Ben Lomond; Yokayo Biofuels in Ukiah, which also has a pump at the Solar Living Institute in Hopland

likely to freeze or gel in temperatures below freezing. However, it is not as environmentally sound as pure biodiesel.

## II. Preliminary Procedure for Starting a Biodiesel Station in Mendocino County

1. Permits
2. Zoning
3. Equipment & Fuel
4. Variance
5. Hazardous Materials Business Plan

### 1. Permits

The first step in opening a biodiesel station includes applying for a Coastal Development Use permit from the Mendocino County Department of Planning and Building. This is a discretionary permit that would be reviewed by various local and state agencies. The fee for permit review is \$3,845, and the process would take 6-9 months. Ten copies of the application will have to be submitted for the Coastal Commission in the event the proposed location is within the Coastal zone. In addition to the application, names and addresses of all property owners within 300 feet and all residents within 100 feet of the site will need to be provided for notification. It is also advised that a copy of the BlueGill report be provided to the Coastal Commission. This review of relevant scientific literature, which also doubles as a standard test for fuel registry with the EPA, concluded that pure biodiesel biodegrades faster and more completely than petroleum diesel in aquatic settings.<sup>3</sup>

Unfortunately, the Planning Department groups biodiesel in with other petroleum products for the permitting process, giving biodiesel a commercial use type similar to automotive and equipment gas sales. This classification could make insurance liability costly. The two biofuel stations consulted on this matter either did not have liability insurance on their biodiesel tank, or could only quote the cost to insure their entire business, which includes aspects besides a biodiesel pump. To get an accurate estimate of how much liability insurance would cost for a proposed pump it will be necessary to call the insurance company used by the current landowner or business operator. It is possible that the decision to make biodiesel a gas/commercial use type could be appealed to the Chief Planner in Ukiah (Frank Lynch). By making an educated pitch to Mr. Lynch and being prepared to answer questions regarding the potential hazards of biodiesel, it is possible that the project could receive a different use permit, therefore potentially making insurance liability cheaper. However, the appeal process could delay the permitting process by several months, in addition to being extremely time-consuming for the party making the “sales pitch.”

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<sup>3</sup> “Comprehensive Health And Environmental Effects Of Biodiesel As An Alternative Fuel”. Sasha Koo-Osimal, Nancy Hahn, and Jon Van Gerpen. EA Engineering, Science and Technology, Inc., Washington, D.C.

## 2. Zoning

Zoning should be for commercial use.

## 3. Equipment & Fuel

Once a permit is approved, the next step is to purchase and install the equipment. In all likelihood, an above ground double-walled containment tank would be needed, since the state still considers biodiesel to be hazardous material (spill and containment regulation applies). A double wall tank and the accompanying parts (the saddle, vents, fill cap and decals) costs approximately \$6,000. A single wall tank is significantly cheaper, costing approximately \$1,500, but it would not receive the approval of the Mendocino County Environmental Health Department. A Weights and Measures approved pump system, including hose and nozzle, costs \$3,500. Installation of the equipment is not considered to be complicated; a welder, plumber, or petroleum maintenance person could handle the assembly and installation with instruction from the equipment provider. Biodiesel can harden or gel in cold temperatures; depending on what the average overnight winter temperature is at the location, so warming equipment may be needed. Suggested options are a submerged heater, a sonic agitator, or heating blankets, but each of these methods has their negative points (it has been difficult to find a manufacturer of a heater that has worked with biodiesel, agitators are expensive and also difficult to find, and the heat from heating blankets may not be able to penetrate the double wall of the tank).

Biodiesel prices fluctuate with petroleum diesel prices. The Biofuel Station in Laytonville currently charges \$3.60 per gallon for on-road use, offering a discount for agricultural use or bulk purchases. Even though biofuel feedstock is not available in California, station operators still prefer to purchase biofuel from an EPA registered producer who has sources within the state because it is more likely to have been produced in an environmentally sound manner than biodiesel produced in the Midwest from soybeans. The best source of fuel for a station would be Yokayo Biofuels in Ukiah. They are currently in the development stage of building their own processing plant, which should be ready in 3-6 months, if all goes well. In the meantime, they sell biodiesel made from recycled fryer grease. Yokayo Biofuels charges \$3.40/gallon for 500-999 gallons and \$3.35/gallon for 1,000-2,499 gallons, although these prices will increase shortly when they start adding a winterizer to the fuel. They offer a 5% discount for non-profit organizations, and free delivery within Mendocino County, in addition to being extremely well versed advocates of biofuel.

## 4. Variance

All diesel fuel must meet the American Society for Testing Materials (ASTM) diesel fuel specification to be sold in California. The ASTM specification for biodiesel is for the fuel's use as a blendstock and not as a neat fuel, so biodiesel B100 and blends over B20 currently has to be sold in the state as a "developmental fuel." The Department of Food and Agriculture's Division of Measurement Standards (DMS) has issued variances so distributors, fuel brokers, and retailers can sell biodiesel and biodiesel blend

developmental fuel. One of the conditions for obtaining a variance is to sell the fuel to centrally fueled fleets. This condition has been liberally interpreted to also include co-ops, biodiesel user groups, and fueling systems with controlled access.<sup>4</sup> The best way to sell biodiesel is to join and purchase fuel through the NorCal Biodiesel Users Group (NorCal BUG). This group, formed by biodiesel advocates with pumping stations in Laytonville and Berkeley, as well as the afore-mentioned Yokayo Biofuels in Ukiah, received one of the first variances ever created. There is no fee to join NorCal BUG, but one would have to agree to meet their standard of customer service and to collect data from customers for submission to the Division of Measurement Standards (the purpose of this is so that the FDA can develop a generally recognized chemical and performance standard for biodiesel). This data, which includes engine make and model, automobile make, model and year, odometer readings, whether or not biodiesel had been used in the vehicle before and if so, for how long, would have to be submitted quarterly to the users group. Membership in the group will require outreach to customers on our part, as it would be the responsibility of the operator to provide education on use, handling, and storage of biodiesel. This community education is important, because biodiesel has a different effect on engines than regular diesel does. For example, biodiesel and biodiesel blends have excellent solvent properties. As a result, their use will dislodge sediment that has built up in fuel tanks, requiring fuel filters to be changed frequently in the early stages of use. Customer education can take the form of a service agreement.<sup>5</sup> According to the owner of the Laytonville biodiesel station, customer outreach and education require the most effort on the part of a biodiesel pump operator/owner, and should require approximately 150 hours per month, with the education aspect requiring the most time. The data compilation should only take about an hour every quarter, as each station in the users group sends their data to the Berkeley member, who then compiles all the data in the group and sends it to the FDA.

## 5. Hazardous Materials

Biodiesel is considered to be a hazardous material in California, so a Hazardous Materials Business Plan (HMBP) must be filed with the Mendocino County Environmental Health Department. Meeting this requirement means formulating an emergency response plan, and having Material Safety Data Sheets (MSDS) on site. The actual Material Safety Data Sheets would come from supplier of biodiesel. The Hazardous Materials Business Plan should be approved within 30 days from the start of dispensing fuel. It is recommended to have the tank up and running, and then submit the HMBP. Once the tank is operational, there will be annual inspections by the Environmental Health Department. The annual permit fee for a 1,000-gallon tank is \$500; for over 1,000 gallons and up to 5,000 gallons, the fee is \$654.

OSHA would have to be notified that biodiesel is being sold on the premises, but one would not need any permits from the Air Quality Board.

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<sup>4</sup> From the 21<sup>st</sup> Century Green Alternative Fuel Consultants web site

<sup>5</sup> **NOTE:** this attachment is for internal use only and may not be reprinted or re-used in any other manner without express written consent from Yokayo Biofuels Inc.

### III Conclusion

The projected total initial cost of opening a biodiesel pump, before liability insurance is purchased, is \$18,973 (see Section IV for breakdown). The estimated monthly profit is \$350, based on current prices of the fuel we would need to purchase and the fuel we would sell, and a projected sale of 1,000 gallons a month. Ongoing costs would include labor hours, which consist of the time it takes to fill-up the vehicles' tanks (average fill-up of 12-16 gallons) and the education of new customers. It is difficult to estimate the number of labor hours without knowing the demand for biodiesel, but a rough estimate is one hour a day, or approximately 30 hours a month.

There appears to be four major responsibilities associated with operating a biodiesel tank – pumping the fuel, educating the customers, answering questions from the public, and accumulating data for the Division of Measurement Standards. The responsibilities of pumping the fuel and educating the customers on proper use and storage of biodiesel (including physically collecting the data sheets) would fall on the pump operator and business owner; Environmental Commons could handle the other responsibilities.

The need for more access to biodiesel on the coast of Northern California is apparent, though the costs of start-up and ongoing operation are high. The provided community service is going to be the greatest benefit.

### IV Breakdown of Start-up Costs

	<u>Based on 1,000 gallon tank</u>
Permit review	\$3,845
Tank	\$6,000
Pump	\$3,500
Heater	\$1,523
Health Dept. permit	\$ 500
Full tank of biodiesel	\$3,350
Labor for installation (3 days)	\$ 255
<b>TOTAL</b>	<b>\$18,973</b>

Sources:

21<sup>st</sup> Century Green Alternative Fuel Consultants web site:  
[www.geocities.com/mr1spike/Biodiesel/California/index.html](http://www.geocities.com/mr1spike/Biodiesel/California/index.html)

Fuel Fact Sheet from the National Biodiesel Board web site: [www.Biodiesel.org](http://www.Biodiesel.org)

Yokayo Biofuels web site: [www.ybiofuels.org](http://www.ybiofuels.org)

County of Mendocino web site: [www.co.mendocino.ca.us/index.html](http://www.co.mendocino.ca.us/index.html)

State of California web site, Air Resources Board page:  
[www.arb.ca.gov/fuels/diesel/altdiesel/altdiesel.htm](http://www.arb.ca.gov/fuels/diesel/altdiesel/altdiesel.htm)

“Comprehensive Health And Environmental Effects Of Biodiesel As An Alternative Fuel”. Sasha Koo-Osimal, Nancy Hahn, and Jon Van Gerpen. EA Engineering, Science and Technology, Inc., Washington, D.C.

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