

**2007 GRANT PROPOSAL SOLICITATION  
Alternative Fuel Incentive Program (AFIP)**

## **Research and Testing**

# **Grant Summary and Authorization Form**

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California Air Resources Board  
June 2007

**Grant Summary and Authorization Form  
Alternative Fuel Incentive Program (AFIP) (Pursuant to AB1811)  
Fiscal Year 2007-08**

**Project Title: Biodiesel Multimedia Assesment (UC Davis)**

**Grant Recipient Name: The Regents of the University of California at Davis**

Authorized Official: Ahmad Hakim-Elahi      AFIP Award: \$69,994

Title: Director of Sponsored Programs      Total Project Cost: \$69,994

Address: Office of Research      Time Period: 6/30/07-6/30/09  
1850 Research Park Drive, Suite 300

University of California      Tax ID #: 94-6036494  
Davis, CA 95618

Grant #: G06-AF36

Phone # (530) 747-3921

The undersigned parties agree to the terms and conditions as set forth in this grant. The following documents are attached and incorporated as part of this grant and take precedence in the following order:

Exhibit A: Grant Provisions

Exhibit B: Work Statement incorporating the following attachments:

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The undersigned parties agree to comply with the requirements and conditions contained herein. The undersigned parties certify under the penalty of perjury that they are duly authorized to bind the parties to this grant.

**California Air Resources Board:**

**Grant Recipient:**

*for*  
Signature of Authorized Official

Signature of Authorized Official *AS*

Name: Marie Stephans  
Title: Chief, Administrative Services Division

Name: Ahmad Hakim-Elahi  
Title: Director of Sponsored Programs

Date: 6/20/07

Date: JUN 27 2007

## EXHIBIT A

### Alternative Fuel Incentive Program Grant

Air Resources Board  
Mobile Source Control & Stationary Source Divisions

### GRANT PROVISIONS

#### 1. GRANT PARTIES AND CONTACT INFORMATION

- 1.1 This grant is from the California Air Resources Board (herein after referred to as ARB) to The Regents of the University of California at Davis on behalf of the Department of Civil and Environmental Engineering (herein after referred to as Grantee).
- 1.2 The ARB Grant Administrators are Ms. Rozanne McPhee. All administrative correspondence regarding this grant shall be directed to:

Ms. Rozanne McPhee  
Administrative Services Division  
Air Resources Board  
P.O. Box 2815  
Sacramento, California 95812  
Phone: (916) 324-9907  
Email: rmcphee@arb.ca.gov

- 1.3 The ARB Grant Manager is Robert Okamoto. All technical correspondence regarding this project shall be directed to:

Robert Okamoto  
Air Resources Board  
Stationary Source Division  
P.O. Box 2815  
Sacramento, California 95812  
Phone: (916) 327-2953  
E-mail: rokamoto@arb.ca.gov

#### 2. TIME PERIOD

- 2.1 Performance of work or other expenses billable to ARB under this grant may commence after signing and awarding of this grant. However, this grant will not be considered valid, and expenses will not be payable, unless and until the grant is fully executed by ARB. The grant period shall end no later than June 30, 2009.

### **3. FINANCIAL MATTERS**

#### **Budget**

- 3.1 The maximum amount of this grant is \$69,994. Under no circumstance will ARB reimburse the Grantee for more than this amount.
- 3.2 The budget for this project is shown in Exhibit B, Attachment A. Except as stated in 3.3, the cumulative grant disbursement for any line (cost) item for the entire project shall not exceed the corresponding figure therein under "AFIP Grant".
- 3.3 The total AFIP funding may be reallocated among cost items or tasks only with the prior approval of the ARB grant manager. The ARB will not unreasonably disapprove budget reallocations provided that they will allow the project to meet its stated goals.

#### **Grant Disbursements**

- 3.4 Requests for payment shall be made with the form "Grant Disbursement Request" (Exhibit B, Attachment E) and conform to the instructions therein. Grant payments shall be made only for reasonable costs incurred by the Grantee and only when the tasks stipulated in Exhibit B, Attachment B, have been accomplished, documentation of accomplishment has been provided to ARB, and any associated deliverables have been provided to ARB. Payments shall not be made more frequently than monthly.
- 3.5 Grantee will be paid for the payment period completed upon receipt, by ARB, of progress reports and any accompanying deliverables satisfying the requirement of this grant (See Part 5 below). The invoice and progress report must be deemed by ARB to reflect reasonable work performed in accordance with this grant.
- 3.6 The Grantee shall mail grant disbursement requests shall be mailed to the grant administrator.
- 3.7 The ARB shall withhold payment equal to ten percent of the total grant cost until completion of all work and submission to ARB by Grantee of a final report (including computer diskette copy) approved in accordance with Exhibit D by ARB. It is University's responsibility to submit an invoice in triplicate with the revised final report for ten percent withheld.

#### **Audits**

- 3.8 The Grantee performing work under this grant agrees that the awarding department, the Department of General Services, the Bureau of State Audits, or their designated representative shall have the right to review and to copy any records and supporting documentation pertaining to the performance of this grant if it exceeds \$10,000. The Grantee performing work agrees to maintain such records for possible audit for a

minimum of three (3) years after final payment, unless a longer period of record retention is stipulated.

#### **4. GRANT MONITORING**

##### **Meetings**

- 4.1 Meeting: A meeting will be held between key project personnel and ARB staff, either at ARB offices in Sacramento or at the project site (at the option of the grant manager), before work on the project begins. The purpose of the first meeting will be to discuss the overall plan, details of performing the tasks, the project schedule, and any issues that may need to be resolved. Additional meetings may be in person or conducted by phone.

##### **Technical Monitoring**

- 4.2 Any significant changes in the scope or schedule for the project shall require the prior written approval of the ARB grant manager and administrator.
- 4.3 The Grantee shall notify the ARB grant manager and administrator, in writing, immediately if any circumstances arise (technical, economic, or otherwise), which might place completion of the project in jeopardy. The Grantee shall also make such notification if there is a change in key project personnel (see Exhibit B, Attachment D).
- 4.4 In addition to progress reports (discussed in section 5), the Grantee shall provide information requested by the grant manager that is needed to assess progress in completing tasks and meeting the objectives of the project.

#### **5. REPORTING REQUIREMENTS**

##### **Progress Reports**

- 5.1 The Grantee shall submit written progress reports at a minimum of three-month intervals. The progress reports shall be provided in the format of Exhibit B, Attachment F.
- 5.2 Every grant disbursement request (Exhibit B, Attachment E) shall be accompanied (or preceded) by a progress report that documents the percent completion of a task specified in Exhibit B, Attachment B, including any special deliverables defined for that task.
- 5.3 If the project is behind schedule, the progress report must contain an explanation of reasons and how the Grantee plans to resume the schedule.

- 5.4 The Grantee shall e-mail the progress reports to the grant manager and the grant administrator. Progress reports that accompany grant disbursement requests shall also be mailed (postal) to the grant administrator.

### **Final Project Report**

- 5.5 When the project is complete, the Grantee shall submit a draft final report as described in "Guidelines for Final AFIP Reports", (Exhibit C). Upon approval of the draft final report by the grant manager, the Grantee shall provide a written copy of the final version, plus an electronic file.

## **6. TERMINATION AND SUSPENSION OF PAYMENTS**

- 6.1 This grant may be canceled at any time by either part, upon thirty (30) days written notice to the other party.

In the case of early termination, the Grantee will submit an invoice in triplicate and a report in triplicate covering services to termination date, following the invoice and progress report requirements of the grant.

Upon receipt of the invoice, progress report, and data, a final payment will be made to the Grantee. This payment shall be for all ARB-approved, actually-incurred costs in accordance with Exhibits B and D, and shall include labor, and materials purchased or utilized (including all noncancellable commitments) to termination date, and pro rata indirect costs as specified in the proposal budget.

- 6.2 The ARB reserves the right to issue a grant suspension order in the event that a dispute should arise, or in the event ARB gives the Grantee a notice that this grant will be terminated. The grant suspension order will be in effect until the dispute has been resolved or this grant has been terminated.

## **7. DISPUTES**

- 7.0 Any dispute concerning a question of fact arising under the terms of this grant which is not disposed of, within a reasonable period of time by agency employees normally responsible for the administration of this grant, shall be brought to the attention the ARB Division Chief (Stationary Source) or designated representative of each agency for joint resolution. The terms and conditions of this grant shall be interpreted in accordance with the laws of the State of California.

## 9. INDEMNITY CLAUSE

9.0 Grantee agrees to defend, indemnify and hold ARB, its officers, employees and agents harmless from and against any and all liability, loss, expense, attorneys' fees, or claims for injury or damages arising out of the performance of this grant but only in proportion to and to the extent such liability, loss, expense, attorneys' fees, or claims for injury or damages are caused by or result from the negligent or intentional acts or omissions of Grantee.

ARB agrees to defend, indemnify and hold Grantee, its officers, employees and agents harmless from and against any and all liability, loss, expense, attorneys' fees, or claims for injury or damages arising out of the performance of this grant but only in proportion to and to the extent such liability, loss, expense, attorneys' fees, or claims for injury or damages are caused by or result from the negligent or intentional acts or omissions of ARB.

EXHIBIT B, Attachment A

**Budget Summary**

**Grantee: UCD**

**Grant No.: G06-AF36**

**Project: Biodiesel Multimedia Assessment (UCD)**

**Costs & Funding**

<b>Direct Costs</b>	<b>Total</b>
1. Salaries	
2	
3	
4.	
5	
6.	
Subtotal:	
Subtotal, Direct Costs:	63631
<b>Indirect Costs</b>	
7. Other Indirect	
Subtotal, Indirect Costs:	6363
<b>Total</b>	<b>69,994</b>



EXHIBIT B, Attachment B

**Project Tasks**

**Grantee: UCD**

**Grant No.: G06-AF36**

**Project Title: Biodiesel Multimedia Assessment (UCD)**

Task	Deliverable (in addition to bimonthly progress reports)	Duration
1	Tier III	No more than two years
2	Preparation of Final Report	Approved no later than June 30, 2009

EXHIBIT B, Attachment C

**Grantee's Project Schedule**

<u>Task #</u>	<u>Task Content</u>	<u>Scheduled Completion Date</u>
1	Tier III	No later than June 30, 2009
2	Preparation of Final Report	Approved no later than June 30, 2009

EXHIBIT B, Attachment D

**Key Project Personnel**

Name	Position	Duties
Tim Ginn	Principal Investigator	Overall coordination of activities
Michael Johnson	Investigator	Aquatic toxicology
Eric LaBolle	Investigator	Ground water/aquafer contamination testing
Jerry A. Last	Investigator	Human health effects
Kate M. Scow	Investigator	Biodegradation in the environment

EXHIBIT B, Attachment E

**Grant Disbursement Request and Expenditures Summary**

Grant No.: G06-AF36

Project Title:

Period covered:

Task # (or "summary"):

*Please submit a separate form for each project task (defined in Exhibit B, Attachment C) that had expenses during the period, plus a summary form for total expenses in the period.*

All expenses to be paid by AFIP must be assigned to a budget line item for which AFIP funds are allowed per Exhibit B, Attachment A (Budget Summary). Attach an itemization of labor charges, showing the numbers of hours spent by each professional member of the grantee's staff or in-kind partner's staff. Provide invoices from subcontractors and identification of goods and services from in-kind supporters.

<b>Direct Costs</b>	<b>Total</b>
1. Salaries	
2	
3	
4.	
5	
6.	
Subtotal:	
Subtotal, Direct Costs:	
<b>Indirect Costs</b>	
7. Other Indirect	
Subtotal, Indirect Costs:	
<b>Total</b>	

I certify that, to the best of my knowledge and belief, the information contained in the attached progress report, including the accounting of expenditures on the project as summarized above, is correct and complete and is in accordance with the grant. In addition, I hereby authorize the California Air Resources Board to make any inquiries to confirm details in the progress report.

\_\_\_\_\_  
Grantee's Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
ARB's Approval Signature

\_\_\_\_\_  
Date

EXHIBIT B, Attachment F

**Guidelines for Progress Report Form**

Date

Grant No.:

Title:

Organization:

Report period:

List (by number) of all tasks that are completed or partially completed:

Work accomplished in this period (organized by task). For completed tasks, compare results to goals

For any planned work or scheduled task that did not occur:

- Reasons for non-occurrence:
- Will the problem persist?:
- Can the work be accomplished in the next work period?:
- Will the nature of tasks or the overall project schedule be affected? (Propose a new schedule, if needed.):

Summarize any changes made during the period in the work plan, budget, or schedule  
Please describe any other current or foreseeable problems and their possible mitigation  
Work planned for the next reporting period (by task):

Provide a narrative as needed to present accomplishments and findings of note.

## EXHIBIT C

### GUIDELINES FOR FINAL REPORT

- Format.* If all components of the final report are in a single Microsoft Word file or PDF file, the report may be delivered to ARB on an electronic medium. Otherwise, there should be one unbound, single-sided copy for photo-copying.
- Font.* Any commonly used font is acceptable if it is at least as large as Arial 12.
- Binding.* The final report may be either spiral bound or stapled.
- Cover.* The ARB will provide a standard cover.
- Title.* The title should duplicate the title of the grant unless a change is approved by the ARB's grant manager.
- Page size.* 8 1/2" x 11"
- Large tables & figures.* Do not include foldouts or highly reduced tables or figures. Large tables and figures should be presented on consecutive 8 1/2" x 11" pages, each page containing one portion of the table or graph
- Color.* Black on white, only.
- Sections.* The final report should contain the following sections, in this order:  
Title page  
Disclaimer  
Acknowledgments  
Table of Contents  
List of Figures  
List of Tables  
Abstract  
[body of report]  
Appendices
- Title page.* The title page should include the grant number, grant title, grantee, date, and this statement: "Conducted under a grant by the California Air Resources Board of the California Environmental Protection Agency".
- Disclaimer.* (may be placed at the bottom of the title page)  
"The statements and conclusions in this report are those of the grantee and not necessarily those of the California Air Resources Board. The mention of commercial products, their source, or their use in connection with material reported herein is not to be construed as actual or implied endorsement of such products."

*Acknowledgments.*

The last paragraph of this section should read as follows:

*Abstract.* The abstract should state the purpose and scope of the project, describe the work performed, and present the results obtained.

*The body of the report* should contain the following sections:

Introduction

This section should include the reason for the study, background information and literature on biodiesel. The introduction should also include the scope of study.

Experimental

Results and Discussion:

Provide narrative of results and present and summarize results of data in tables and figures. Discuss results.

Appendices Provide detailed data results for QA/QC, laboratory and emissions data, and support information and data in the appendices.

**The ARB will not regard the final report as a confidential document. Do not include proprietary information.**

EXHIBIT D  
PROPOSAL

**Grant No.: G06-AF36**

**Biodiesel Multimedia Assessment (UCD)**

Submitted to the  
California Air Resources Board  
4/26/07

**Alternative Fuel Incentive Program (AFIP) (Pursuant to AB1811)  
Fiscal Year 2007-08**

Attach Proposal



## **Biodiesel Multimedia Assessment**

### **Tier III Assessment**

Proposed Scope of Work

University of California, Davis

T.R. Ginn, PI

Initial Budget: \$69,994

### **Background**

Biodiesel is the name of an alternative diesel-equivalent fuel, derived from biological sources (such as vegetable oils), which can be used in unmodified diesel-engine vehicles. Biodiesel contains no petroleum, but it can be blended at any level with petroleum diesel to create a biodiesel blend. Biodiesel is made through a chemical process called transesterification whereby the glycerin is separated from the fat or vegetable oil. The process leaves behind two products – methyl esters (the chemical name for biodiesel) and glycerin (a valuable byproduct usually sold to be used in soaps and other products). According to the California Environmental Protection Agency, an “Alternative Diesel Fuel” is any fuel used in diesel engines that is not a reformulated diesel fuel as defined in Sections 2281 and 2282 of Title 13, of the California Code of Regulations, and does not require engine or fuel system modifications for the engine to operate, although minor modifications (e.g. recalibration of the engine fuel control) may enhance performance.

As required by Section 43830.8 California Health and Safety Code, before adopting new fuel specifications, the California Air Resources Board (CARB) must provide a “multimedia assessment” of these new fuels. Many if not most biodiesel formulations meet the requirement for a multimedia assessment. CARB with input from the University of California has prepared guidelines for “multimedia” evaluations of new fuels. A draft of these guidelines was issued in March 2006 and will undergo review by California Environmental Policy Council for final approval. This report is titled “Guidance Document and Recommendations on the Types of Scientific Information to be submitted by Applicants for California Fuels Environmental Multimedia Evaluations” and is currently in draft status awaiting final revisions by the UC Davis and others. We refer to this document here as the MMAG. This document was prepared to assist the California EPA’s Multimedia Working Group (MMWG) in making decisions about new fuel specifications.

Among the key findings of this report is that the State of California needs information that will allow an informed decision as to the relative risk posed by any newly proposed fuel technology to the State’s resources, human health and the environment. New fuels or potential additives must be evaluated not only with regard to engine performance and emission requirements but also with consideration of health and environmental criteria involving airborne toxics and associated health risks, ozone formation potential, hazardous waste generation and management and surface and groundwater contamination resulting from production, distribution, and use. The MMAG sets out for both the CalEPA and new fuel applicants a set of recommended guidelines regarding how to approach, conduct, and evaluate a multimedia evaluation.

The key elements of the philosophy and approach in these recommendations are (a) flexibility to address factors unique to each fuel type, and (b) a tiered process for consultation and review within a lifecycle context. Consultation and review provides a means for the presentation of information by new fuel proponents and feedback iterations from the MMWG aided by expert consultation and peer review. The tiered structure is designed to accommodate the need to provide defensible information and scientific studies that are comprehensive, flexible enough to capture issues unique to each fuel, and based on iterative review and consultation. The MMAG defines three tiers that compose the multimedia assessment process:

- Tier I. Technical consultation and peer review to establish the risk assessment elements and issues
- Tier II. Development and review of experimental design for future actions and reports
- Tier III: Implementation of a Final Multimedia Risk Assessment and submission of Final Report that is peer reviewed and is used as the basis for the Multimedia Working Group recommendations presented to the Environmental Policy Council.

Here we provide a scope of work for an effort to carry out Tier III of a three-tiered multimedia assessment for the use of biodiesel formulations in the State of California. This work will be carried out by researchers at the University of California collaborating with the staff of the California Environmental Protection Agency and members of the MMWG. In the text below, we describe the tasks involved in this effort, projected timelines for this effort, and the projected budget for UC Davis. It should be noted that both the timelines and cost estimates for this task represent available resources, but not necessarily the resources need to complete the required efforts for these evaluations. The reason for presenting the budget and timelines in this way is that the scope of work and timeline for Tier-III efforts cannot be accurately characterized without results from the Tier I report. So what we provide here are estimates of the FTE and experimental resource costs from our best estimates of the level of effort involved in this task. This agreement with UCD is in parallel with a sister agreement with colleagues at UC Berkeley who provide complementary capabilities for addressing the same needs. The particular expertise at UC Davis contributing to this project include: Scow (biodegradation in the environment), Johnson (aquatic toxicology), Ginn (subsurface partitioning), LaBolle (fate and transport in groundwater), and Last (human health effects).

## **Scope of Work**

In Tier III the products of the Tier II efforts will be used to prepare a final comparative Multimedia Risk Assessment, according to the agreed upon design developed through Tiers I and II. A final Multimedia Risk Assessment report will be prepared and submitted to the MMWG for evaluation and preparation of recommendations to the Environmental Policy Council. Prior to submittal to the Environmental Policy Council, the submitted Final Multimedia Risk Assessment report as well as the MMWG recommendation will undergo independent external expert Tier III Peer Review.

Tier III work will commence upon receipt of review and concordance with the efforts and budget proposed in the Tier I Work Plan and agreed upon in the Tier II Risk Assessment Design. The deliverable Tier III report will involve a critical summary of the results of the Tier I and Tier II activities, in light of the peer review comments received. The critical summary will include discussions of: the basis for selection of the base fuel, the priority release scenarios, the transport and fate, and toxicological/exposure pathway conceptual model hypotheses and assumptions, and resolved any remaining uncertainties and knowledge gaps. In addition to the critical summary, the Tier III report will present the overall findings and conclusions of the comparative multimedia risk assessment, including discussion of impacts to air, water, and general environmental resources, impacts to human health, and waste management issues. The estimated budget and timelines below represent a best estimate based on anticipated activities, tasks, and available funds to complete the Tier III report. Unanticipated activities and tasks that are subsequently identified to complete the Tier III report would add additional costs to the budget and would need to be negotiated with ARB staff. In the event that additional funds are not available, a Tier III report will be completed based on the available information with a discussion of remaining uncertainties and knowledge gaps that could be addressed with additional funding.

*Deliverable:* Tier III report

*Initial Budget:* \$69,994

*Timeline:* 30 June 2007 - 30 June 2009

### **Contingency Provision**

Supplemental projects have been scored and are approved conditioned upon the availability of funds as determined by the Air Resources Board (ARB). The ARB Executive Officer shall make funding determinations based on whether funds for granted projects have been expended by grant agreement specified schedules or dates, or by June 30, 2009, whichever is earlier. Funds for projects failing to satisfy provisions of the grant award may be redirected to the next highest scored project(s) on the list of supplemental projects.

