

STATE OF CALIFORNIA  
**STANDARD AGREEMENT**  
 STD 213 (Rev 06/03)

AGREEMENT NUMBER <b>15-C0056</b>
REGISTRATION NUMBER

1. This Agreement is entered into between the State Agency and the Contractor named below:
- STATE AGENCY'S NAME  
 Department of Pesticide Regulation, hereinafter referred to as "State"
- CONTRACTOR'S NAME  
 The Regents of the University of California, hereinafter referred to as "University"
2. The term of this Agreement is: February 1, 2016 through December 31, 2018
3. The maximum amount of this Agreement is: \$ 208,191.00
4. The parties agree to comply with the terms and conditions of the following Exhibits, which by this reference are made a part of the Agreement.

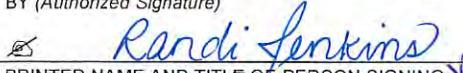
<b>Exhibit A – A5:</b> A–Scope of Work; A1–Deliverables; A2–Key Personnel; A3–Authorized Representatives; A4–Preexisting Data; A5–CV/Resumes	17 page(s)
<b>Other Exhibits A</b> (when applicable): A6–Current & Pending Support; A7–Third Party Confidential Information Requirement	0 page(s)
<b>Exhibit B – B–Budget;</b> B1–Budget Justification; B2–Subrecipient Budgets (if applicable); B3– Invoice Elements	5 page(s)
<b>Exhibit C*</b> – University Terms and Conditions	UTC-116

Check mark additional Exhibits below, and attach Exhibits or provide internet link:

- Exhibit D** – Additional Requirements Associated with Funding Sources page(s)
- Exhibit E** – Special Conditions for Security of Confidential Information page(s)
- Exhibit F** – Access to State Facilities and Computing Resources page(s)
- Exhibit G** – If applicable page(s)

Items shown with an Asterisk (\*) are hereby incorporated by reference and made part of this agreement as if attached hereto.  
 These documents can be viewed at <http://www.dgs.ca.gov/ols/Resources/StandardContractLanguage.aspx>.

IN WITNESS WHEREOF, this Agreement has been executed by the parties hereto.

CONTRACTOR		California Department of General Services Use Only 
CONTRACTOR'S NAME (if other than an individual, state whether a corporation, partnership, etc.) The Regents of the University of California		
BY (Authorized Signature) 	DATE SIGNED (Do not type) 3.7.2016	
PRINTED NAME AND TITLE OF PERSON SIGNING Randi Jenkins, J.D. Associate Director		
ADDRESS 1850 Research Park Drive, Suite 300, Davis, CA 95618-6153		
STATE OF CALIFORNIA		
AGENCY NAME Department of Pesticide Regulation		
BY (Authorized Signature) 	DATE SIGNED (Do not type) 3.15.16	
PRINTED NAME AND TITLE OF PERSON SIGNING Anise Severns, Assistant Director		
ADDRESS 1001 I Street, 4 <sup>th</sup> Floor, Sacramento, CA 95814		
<input type="checkbox"/> Exempt per: 		

## Exhibit A

### Project Summary & Scope of Work

#### Project Summary/Abstract

*Briefly describe the long-term objectives for achieving the stated goals of the project.*

#### If Third-Party Confidential Information is to be provided by the State:

- Performance of the Scope of Work is anticipated to involve use of third-party Confidential Information and is subject to the terms of this Agreement; **OR**
- A separate CNDA between the University and third-party is required by the third-party and is incorporated in this Agreement as Exhibit A7.

#### Scope of Work

*Describe the goals and specific objectives of the proposed project and summarize the expected outcomes. If applicable, describe the overall strategy, methodology, and analyses to be used. Include how the data will be collected, analyzed, and interpreted as well as any resource sharing plans as appropriate. Discuss potential problems, alternative strategies, and benchmarks for success anticipated to achieve the goals and objectives.*

1. This Agreement is between the Department of Pesticide Regulation, hereinafter referred to as DPR, and The Regents of the University of California, hereinafter referred to as UC Davis or Contractor.
2. This Agreement will commence on the start date of February 01, 2016 as presented herein or upon final approval by the State, whichever is later and no work shall begin before that time. This Agreement is of no effect unless approved by the State. Contractor shall not receive payment for work performed prior to approval of the Agreement and before receipt of notice to proceed by the Contract Manager. This Agreement shall expire on December 31, 2018. The services shall be provided during normal working hours.
3. This contract will utilize a project management team to review and update the progress of the contract. The project management team will consist of Dr. Loren Oki (UC Davis, Principal Investigator), Karey Windbiel-Rojas (UC Davis, Co-Principal Investigator), Michael Ensminger (DPR-Environmental Monitoring), Rick Strider (DPR-Enforcement) and other professionals from UC Davis and from Pesticide Control Operator Companies located in the Sacramento area as selected by this core group.
4. Contractor Responsibilities
  - A. Background and Goals

It has been estimated that hundreds of millions of pounds of urban pesticides are applied annually, resulting in urban surface waters that are contaminated with several different pesticides. Runoff sources include storm water, but a significant amount is from non-storm sources including landscape irrigation, washing of surfaces (driveways, sidewalks, etc.), and other outdoor activities. Monitoring research has shown that numerous pesticides are detected in surface waters at concentrations that may be toxic to sensitive aquatic organisms. More often several different pesticides are found in

surface waters simultaneously, and these combinations may have a synergetic toxic effect to aquatic organisms.

A main goal of urban pesticide mitigation is to reduce pesticide loads in runoff sources which flow into surface waters. This can be accomplished in various ways, such as increasing irrigation efficiency, on-site retention, bioremediation of runoff, improving pesticide application techniques, and using integrated pest management (IPM) to control pest problems. Alternatively, regulations or label changes may also help reduce pesticide loads. Due to lack of awareness or understanding, individual Pest Control Operators (PCOs) and PCO businesses may not immediately adopt these changes. The main goal of this contract is to train PCOs and PCO businesses on non-agricultural pyrethroid outdoor applications based on US EPA labels and on the California Code of Regulations, Title 3, Food and Agriculture regulation 6970, Surface Water Protection in Outdoor Nonagricultural Settings.

#### B. Work to be Performed

UC Davis agrees to perform the services listed below. Title of Contract will be "Training Pesticide Control Operators (PCOs) and PCO companies in Urban Pyrethroid Applications."

This project will train PCOs and PCO companies in the Sacramento/Folsom area on DPR's regulations to protect surface water in nonagricultural settings (Section 6970 of the California Code of Regulations, Title 3, Food and Agriculture) (<http://cdpr.ca.gov/docs/legbills/calcode/040501.htm#a690>), also incorporating 2013 US EPA pyrethroid label changes for outdoor non-agricultural products (<http://www.epa.gov/oppsrrd1/reevaluation/environmental-hazard-statement.html#outdoor>) and changes to bifenthrin labels based on DPR's 2011 Memorandum of Agreement ([http://www.cdpr.ca.gov/docs/registration/reevaluation/chemicals/list\\_pyrethroids.htm](http://www.cdpr.ca.gov/docs/registration/reevaluation/chemicals/list_pyrethroids.htm)). Training will focus on proper outdoor pyrethroid application methods based on these regulations and label changes. Alternatives, such as IPM, lower-risk pesticides, etc. may also be incorporated into the training. Training will consist of workshops, limited to 30 individuals each, consisting of short presentations and "hands on" and "how to" activities. During the term of the contract, a minimum of three workshops will be held. Workshop training curriculum will be developed under guidance of the project management team and progress will be discussed in quarterly meetings. Workshops will be modeled after those given for DPR-UCD contract 13-C0012 (Appendix 1). Training material can consist of existing materials or can be created anew (for a bibliography or resources from DPR-UC contract 13-C0012, contact Darren Haver, UC Davis South Coast Research and Extension Center, at [dlhaver@ucanr.edu](mailto:dlhaver@ucanr.edu)). Outreach materials may also consist of messaging to homeowners to manage activities such as irrigation that could contribute to runoff.

All outreach activities will be conducted in partnerships with the California Center for Urban Horticulture (CCUH) program at UC Davis and the UC Statewide IPM Program's (UC IPM) Urban & Community IPM group. PCOs will be targeted based on those that apply outdoor pesticides for ant and other invertebrate pest control in the monitoring areas of DPR's Northern California monitoring study ([http://www.cdpr.ca.gov/docs/emon/pubs/protocol/study269protocol2014\\_15.pdf](http://www.cdpr.ca.gov/docs/emon/pubs/protocol/study269protocol2014_15.pdf)), specifically in Folsom, CA. Experiences of delivering outreach messages from a previous SWRCB study (Agreement 04-231-550) conducted by Oki's research group will be incorporated. The contractor will obtain DPR and Structural Pest Control Board (SPCB) continuing education credit for the workshops (<http://www.cdpr.ca.gov/docs/license/conted.htm>).

C. Tasks and Deliverables:

Task	Description	Deliverable
1	Identify PCOs that apply pesticides outdoors to control ants and other nuisance pests, and determine their interest in participating in workshops detailing proper pesticide (pyrethroid) application and using alternative management practices for the control of outdoor insects and other invertebrate pests.	List of major PCOs in the target area; list of PCOs willing to participate (name, organization, telephone number, email). Submitted to DPR as an EXCEL file.
2	Conduct a survey of PCO's current use of pesticides used outdoors, current outdoor application methods, and current IPM practices, including alternate application methods and use of less toxic pesticides (using malathion, pyrethroids, and fipronil as a "more toxic" pesticide reference). Survey will occur prior to any training. Note: Institutional Review Board (IRB) review and approval is required to conduct the PCO survey.	Survey, results, analysis of the results. Submitted to DPR as an EXCEL file. Survey can be submitted as a WORD document.
3	Develop a curriculum/training program on proper pyrethroid application based on current regulations and new EPA labels.	Agenda item on quarterly meetings (until completed). Word document of training materials and curriculum prior to workshops.
4	Obtain DPR and SPCB CE (continuing education) credits for upcoming workshops.	Confirmation or emails from DPR and SPCB confirming CE credits obtained.
5	Conduct a minimum of three workshops/training sessions for PCOs.	Agenda for workshops. Speaker list for workshops. Location and time of workshops. Submitted to DPR as an EXCEL, WORD or an unlocked pdf file.
6	Conduct a follow-up survey of the participating PCOs to evaluate the effectiveness of the workshops and PCO's new knowledge of current pesticide labels and regulations as well as alternative application methods (IPM, etc.).	Survey, results, analysis of the results. Submitted to DPR as an EXCEL file. Survey can be submitted as a WORD document.
7	Project Administration Meet with the Project Management Quarterly. Meetings to be arranged by the Contractor and may be telephone conferences. Contractor must notify DPR's Contract Manager of meeting times 14 days prior to the meeting. Contractor will provide agendas to the Project Management Team at least seven days prior to the meeting. The contractor will also provide minutes of the meeting to the Project Management Team within 14 days after the meeting.	Meeting arrangements Meeting agendas Meeting minutes
8	Dissemination of the data	
	Annual report	Reports (in WORD) on the progress of the contract.
	Final Report of survey results and other tasks in the contract. To include data interpretation, an analysis of the (survey) data, and recommendations from the study.	Report in WORD with EXCEL data files attached.
	Seminar at the conclusion of the contract	Seminar at DPR in Sacramento CA or other site as agreed upon by the contract manager.

Task	FY15-16		FY16-17				FY17-18				FY18-19	
	Jan-Mar	Apr-Jun	Jly-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Jly-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Jly-Sep	Oct-Dec
1. PCO lists	X	X	X	X								
2. Initial survey			X	X	X	X	X	X	X			
3. Curriculum development	X	X	X	X	X							
4. Obtain CE hours		X	X	X	X							
5. Workshops/Training				X	X	X	X	X	X	X		
6. Follow-up surveys				X	X	X	X	X	X	X		
7. Project Administration	X	X	X	X	X	X	X	X	X	X	X	X
8. Dissemination of data				X					X	X	X	X

**5. DPR Responsibilities**

Michael Ensminger and Rick Strider will provide consultation in development of the training materials, survey development and analysis, participate in meetings, and make presentations as needed. DPR will review all reports and publications and provide arrangements for the seminar at DPR.

## Exhibit A1

### SCHEDULE OF DELIVERABLES

List all items that will be delivered to the State under the proposed Scope of Work. Include all reports, including draft reports for State review, and any other deliverables, if requested by the State and agreed to by the Parties.

Deliverable*	Description	Due Date
PCO Lists	List of major PCOs in the target area; list of PCOs willing to participate (name, organization, telephone number, email). Submitted to DPR as an EXCEL file.	12/31/2016
Initial Survey	Survey, results, analysis of the results. Submitted to DPR as an EXCEL file. Survey can be submitted as a WORD document.	3/31/2018
Curriculum development	Agenda item on quarterly meetings (until completed). Word document of training materials and curriculum prior to workshops.	3/31/2017
Obtain CE hours	Confirmation or emails from DPR and SPCB confirming CE credits obtained.	3/31/2017
Workshops/Training	Agenda for workshops. Speaker list for workshops. Location and time of workshops. Submitted to DPR as an EXCEL, WORD or an unlocked pdf file.	6/30/2018
Follow-up surveys	Survey, results, analysis of the results. Submitted to DPR as an EXCEL file. Survey can be submitted as a WORD document.	6/30/2018
Project Administration	Meeting arrangements. Meeting agendas. Meeting minutes	12/31/2018
Dissemination of data	Report in WORD with EXCEL data files attached. Seminar at DPR in Sacramento CA or other site as agreed upon by the contract manager.	12/31/2018
<b>The following Deliverables are subject to paragraph 18. Copyrights, Section B of Exhibit C</b>		

\* If use of any Deliverable is restricted or is anticipated to contain Preexisting Data or copyrightable works with any restricted use, it will be clearly identified in Exhibit A4, Use of Preexisting Data, Copyrighted Works and Deliverables.

## Exhibit A2

### KEY PERSONNEL

List Key Personnel as defined in the Agreement starting with the PI, by last name, first name followed by Co-PIs. Then list all other Key Personnel in alphabetical order by last name. For each individual listed include his/her name, institutional affiliation, and role on the proposed project. Use additional consecutively numbered pages as necessary.

This contract will utilize a project management team to review and update the progress of the contract. The project management team will consist of Dr. Loren Oki (UC Davis, Principal Investigator), Karey Windbiel-Rojas (UC California, Division of Agriculture and Natural Science [ANR]), Michael Ensminger (DPR-Environmental Monitoring), Rick Strider (DPR-Enforcement) and other professionals from UC Davis and from Pesticide Control Operator Companies located in the Sacramento area as listed below.

Last Name, First Name	Institutional Affiliation	Role on Project
<b>PI:</b>		
<i>Oki, Lorence R.</i>	<i>University of California, Davis</i>	<i>Principal Investigator</i>
<b>Co-PI(s) – if applicable:</b>		
<i>Windbiel-Rojas, Karey</i>	<i>University of California Davis</i>	<i>Co-Principal Investigator</i>
<b>Other Key Personnel (if applicable):</b>		
<i>Sutherland, Andrew</i>	<i>University of California, Davis</i>	<i>Collaborator</i>
<i>Fujino, Dave</i>	<i>University of California, Davis</i>	<i>Collaborator</i>
<i>Van Steenwyk, Darren</i>	<i>Clark Pest Control</i>	<i>Technical Advisor - Collaborator</i>
<i>Steed, Jim</i>	<i>Neighborly Pest Control</i>	<i>Technical Advisor - Collaborator</i>
<i>Strider, Rick</i>	<i>Department of Pesticide Regulation</i>	<i>DPR Enforcement Technical Advisor</i>
<i>Ensminger, Michael</i>	<i>Department of Pesticide Regulation</i>	<i>DPR Contract Project Manager</i>

Other individuals may be substituted or added later, based on needs of the project team.

### Exhibit A3

#### AUTHORIZED REPRESENTATIVES AND NOTICES

The following individuals are the authorized representatives for the State and the University under this Agreement. Any official Notices issued under the terms of this Agreement shall be addressed to the Authorized Official identified below, unless otherwise identified in the Agreement.

Changes in the University Principal Investigator are subject to the Key Personnel section of this Agreement. Changes in other contact information may be made by notification, in writing, between the parties.

<b>State Agency Contacts</b>	<b>University Contacts</b>
<p>Agency Name: Department of Pesticide Regulation</p> <p><b>Contract Project Manager (Technical)</b></p> <p>Name: Michael Ensminger Senior Environmental Scientist Address: Environmental Monitoring Branch 1001 I Street Sacramento, CA 94814 Telephone: (916) 324-4186 Fax: (916) 324-4088 Email: <a href="mailto:michael.ensminger@cdpr.ca.gov">michael.ensminger@cdpr.ca.gov</a></p>	<p>University Name: The Regents of the University of California, Davis</p> <p><b>Principal Investigator</b></p> <p>Name: Lorence R. Oki Cooperative Extension Associate Specialist Address: Department of Plant Science One Shields Avenue Davis, CA 95616-8780 Telephone: (530) 754-4135 Fax: (530) Email: <a href="mailto:lroki@ucdavis.edu">lroki@ucdavis.edu</a></p>
<p><b>Authorized Official (contract officer)</b></p> <p>Name: Anise Severns Assistant Director Address: Administrative Services Division 1001 I Street Sacramento, CA 95814</p> <p><b>Send notices to (if different):</b></p> <p>Name: Michael Ensminger Senior Environmental Scientist Address: Environmental Monitoring Branch 1001 I Street Sacramento, CA 94814 Telephone: (916) 324-4186 Fax: (916) 324-4088 Email: <a href="mailto:michael.ensminger@cdpr.ca.gov">michael.ensminger@cdpr.ca.gov</a></p>	<p><b>Authorized Official</b></p> <p>Name: Randi Jenkins, J.D. Associate Director Address: Sponsored Programs Office 1850 Research Park Drive, Suite 300 Davis, CA 95618 Telephone: 530-754-7679 Fax: 530-754-7894 Email: <a href="mailto:awards@ucdavis.edu">awards@ucdavis.edu</a></p> <p><b>Send notices to (if different):</b></p> <p>Name: Victoria Sissac Contracts and Grants Analyst Address: Sponsored Programs Office 1850 Research Park Drive, Suite 300 Davis, CA 95618 Telephone: 530-754-8094 Fax: 530-754-7894 Email: <a href="mailto:awards@ucdavis.edu">awards@ucdavis.edu</a> and <a href="mailto:vsissac@ucdavis.edu">vsissac@ucdavis.edu</a></p>

<p><b><i>Administrative Contact</i></b></p> <p>Name: Terry Harrison Contract Analyst</p> <p>Address: Business Services Office 1001 I Street Sacramento, CA 95814</p> <p>Telephone: (916) 445-2511</p> <p>Fax: (916) 445-6845</p> <p>Email: <a href="mailto:terry.harrison@cdpr.ca.gov">terry.harrison@cdpr.ca.gov</a></p>	<p><b><i>Administrative Contact</i></b></p> <p>Name: Victoria Sissac Contracts and Grants Analyst</p> <p>Address: Sponsored Programs Office 1850 Research Park Drive, Suite 300 Davis, CA 95618</p> <p>Telephone: 530-754-8094</p> <p>Fax: 530-754-7894</p> <p>Email: <a href="mailto:awards@ucdavis.edu">awards@ucdavis.edu</a> and <a href="mailto:vsissac@ucdavis.edu">vsissac@ucdavis.edu</a></p>
<p><b><i>Financial Contact/Accounting</i></b></p> <p>Name: Department of Pesticide Regulation</p> <p>Address: Attn: Accounts Payable P.O. Box 4015, MS 4A Sacramento, CA 95812-4015</p>	<p><b><i>Authorized Financial Contact/Invoicing</i></b></p> <p>Name: The Regents of the University of California</p> <p>Address: Cashier's Officer P.O. Box 989062 Davis, CA 95798-9062</p>

### Exhibit A4

#### USE OF PREEXISTING DATA, COPYRIGHTED WORKS AND DELIVERABLES

*If the either Party will be using any third-party or pre-existing data or copyrighted works that have restrictions on use, then list all such data or copyrighted works and the nature of the restriction below. If no third-party or pre-existing data or copyrighted works will be used, check "none" in this section.*

- A. State: Preexisting Data and/or copyrighted works to be provided to the University from the State or a third party for use in the performance in the Scope of Work.

None or  List:

Owner (State Agency or 3 <sup>rd</sup> Party)	Type of Data or copyrighted work (Restricted or Unrestricted)	Description	If Restricted, nature of restriction:

- B. University: Use of Preexisting Data or copyrighted works included in Deliverables identified in Exhibit A1.

None or  List:

Owner (University or 3 <sup>rd</sup> Party)	Type of Data or copyrighted work (Restricted or Unrestricted)	Description	If Restricted, nature of restriction:

- C. Anticipated restrictions on use of Project Data.

*If the University PI anticipates that any of the Project Data generated during the performance of the Scope of Work will have a restriction on use (such as subject identifying information in a data set) then list all such anticipated restrictions below. If there are no restrictions anticipated in the Project Data, then check "none" in this section.*

None or  List:

Owner (University or 3 <sup>rd</sup> Party)	Description	Nature of Restriction:

## Exhibit A5

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### CURRICULUM VITAE (CV) / RÉSUMÉS / BIOSKETCH

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*Attach CV/Résumé/Biosketch for Key Personnel listed in Exhibit A2*

#### Resumes of PI and Co-PI

Lorence (Loren) R. Oki  
Cooperative Extension Specialist, Landscape Horticulture

Department of Plant Sciences, MS 6  
University of California  
One Shields Avenue  
Davis, CA 95616-8780 USA

1110 Env Hort  
Phone: (530) 754-3145  
Fax: (530) 754-4883  
email: [lroki@ucdavis.edu](mailto:lroki@ucdavis.edu)

I have been a member of the faculty at UC Davis since 2002 and serve as the Cooperative Extension Specialist in Landscape Horticulture. This appointment is held jointly with the Department of Plant Sciences (80%) and the Landscape Architecture Program in the Department of Environmental Design (20%).

My research focuses on water issues in urban horticulture. I recently led a large project funded by the California State Water Resources Control Board and the CALFED Bay-Delta Program that characterized runoff from residential areas and studied the effectiveness of management methods to reduce the runoff and the pollutants that may be included in it. There are four study sites in Sacramento County and four more in Orange County used in this project. This project also developed information to promote the implementation of low impact landscape management methods and measures the effectiveness of outreach methods. From our data, pollutant loading models are being developed to demonstrate how changes in landscape features might affect loading.

To refine irrigation management in urban landscapes, my research group is examining the water use of plants selected from the UC Davis Arboretum that are potential ornamental landscape plants. Selected plants are distributed to several demonstration sites around the State for further evaluations by UCCE Master Gardeners for garden performance in different climate zones.

A completed project funded by the Santa Clara Valley Water District quantified the tolerance of Coast Redwood to sodium and chloride when they are irrigated with low quality water. Future work will look at the tolerance of landscape plants to irrigation with low quality water such as reclaimed municipal water.

My group is examining how slow sand filtration and other natural water treatment systems remove plant pathogens, including *Phytophthora ramorum* the organism that causes Sudden Oak Death disease, and other pollutants from nursery irrigation runoff. The treated water could then be safely reused for irrigation.

My Ph.D. is in Ecology (2002) from UC Davis and I conducted my dissertation research in the Environmental Horticulture (now Plant Sciences) Department quantifying the effects of salinity on rose stem elongation rates. I hold an M.S. in Plant Science from UC Riverside (1976) where I worked in plant tissue culture studying the role of chromosomal proteins in cell differentiation. My B.S. in Ornamental Horticulture (1974) is from California State Polytechnic University, San Luis Obispo. Prior to receiving my doctorate, I worked in the horticulture industry as a grower of nursery and greenhouse crops in the Sacramento area.

#### EDUCATION

**Ph.D.**, Ecology, University of California, Davis, March 2002. Dissertation: Effects of Substrate Salinity on Rose Stem Elongation. Advisor: Dr. J. Heinrich Lieth

**Certificate**, Program in College Teaching, University of California, Davis, June 1998

**Master of Science**, Plant Science, University of California, Riverside. June 1976. Advisor: Dr. Toshio Murashige

**Bachelor of Science**, Ornamental Horticulture, California Polytechnic State University, San Luis Obispo, June 1974. Advisor: Dr. Howard Brown.

#### RESEARCH

UC Davis, October 2002 - present

Characterizing runoff from urban sources. Developing management methods to reduce water use, runoff, and pollutant loading from urban landscapes. Evaluating the water use of landscape plants. Introduction of plants for landscape uses. Using slow sand filtration systems to treat runoff. Tolerance of landscape plants to low quality water.

#### TEACHING (SELECTIONS)

**Instructor**. Urban Ecology. PLS162. UCD. Winter 2009 & 10. Presented class on pollution from urban landscapes.

**Instructor**. Integrative Horticulture and Agronomy - Practices. HRT200A. UCD. Spring 2008, Fall 2008, 09, & 10. Presented classes on landscape water issues.

**Instructor**. Proseminar, LDA 190, UCD. Fall 2003. Organized "Landscape Management" series.

**Instructor**. Greenhouse and Nursery Management, ENH125. Presented classes and labs on bedding plant production and fertility management. Winters 2002-10

**Instructor**. Introduction to Greenhouse Management. UC Davis Extension. 2001, 2002, 2003.

#### PUBLICATIONS (SELECTIONS)

Gan, J., Bondarenko, S., L. Oki, D. Haver, J.X. Li. 2012. Occurrence of fipronil and its biologically active derivatives in urban residential runoff. *Environ. Sci. & Technol.*, 46, 1489-1495.

Lin, K., D. Haver, L. Oki, and J. Gan. 2009. Persistence and sorption of fipronil degradates in urban stream sediments. *Env. Tox. & Chem.* 28(7): 1462-1468.

Lin, K., D. Haver, L. Oki, and J. Gan. 2008. Transformation and sorption of fipronil in urban stream sediments. *J. Agric. Food Chem.* 56(18): 8594-8600.

Reid, S.K. and L.R. Oki. 2008. Trial identifies promising selections for UC Davis Arboretum "All-Stars" Plant Introduction Program. *Calif. Ag.* 62(3): 97-104.

Lieth, J.H. and L.R. Oki. 2007. Irrigation in Soilless Production. In: *Soilless Culture: Theory and Practice*. M. Raviv & J.H. Lieth, eds. Elsevier Press, Amsterdam.

Coates, R.W., M.J. Delwiche, R.Y. Evans, L.R. Oki, and P.H. Brown. 2007. Site-specific water and nutrient application by wireless valve controller network. ASABE Annual Meeting, June 17-20, 2007. Paper No. 072247. St. Joseph, MI. 11 pages.

Oki, L.R., N.S. Mattson, and J.H. Lieth. 2006. Predicting stem length of cut flower roses as harvest using stem elongation rates in relationship to developmental events. *Acta Hort.* 718:113-120.

Oki, L.R. and J.H. Lieth. 2004. Effect of changes in substrate salinity on the elongation of *Rosa hybrida* L. 'Kardinal' stems. *Sci. Hort.* 101: 103-119.

**ACADEMIC SERVICE, UNIVERSITY OF CALIFORNIA (SELECTIONS)**

Co-Director, UC Nursery and Floriculture Alliance, 2009-present  
Director, Env. Horticulture Research & Info. Ctr., Div. Agric. and Nat. Res., 2009-present  
Associate Editor, Environmental Horticulture, Div. Agric. and Nat. Res., 2003-2009  
Member, UCCE Hansen Trust Research Advisory Committee, 2007-present  
Co-Chair, CA Ctr. for Urban Horticulture Implementation Comm., UCD CA&ES, 2005-06  
Member, Env. Hort. & Urban Forestry Major Comm., UCD Dept. Plant Sci., 2005-present  
Chair, Div. Agric. and Nat. Res., Landscape Horticulture Workgroup, 2003-08  
Member, Div. Agric. and Nat. Res., Landscape Horticulture Workgroup, 2002-present  
Member, Div. Agric. and Nat. Res., Floriculture and Nursery Workgroup, 1998-present  
Member, Div. Agric. and Nat. Res., Turfgrass Workgroup, 2007-present  
Member, Div. Agric. and Nat. Res., Water Quality Workgroup, 1998-present

**PROFESSIONAL SERVICE AND AFFILIATIONS (SELECTIONS)**

**CA Dept of Water Resources**

Senate Bill x7-7 Urban Stakeholder Committee Member, 2010-present

**Ecolandscape California**

Committee Member, 2004-present

**International Plant Propagators' Society**

Member, 1979-present

Member, Western Region Board of Directors, 1989-94

International Alternate Delegate Western Region, 1993-94

Chair, Western Region Long Range Planning- Nominating Committee, 1993-94

President, Western Region, 1992-93

Vice President, Western Region, 1989-92

Member, Western Region Annual Meeting Committee, 1986, 88, 92 (Chair), 96, 2010

**California Association of Nurseries and Garden Centers**

Member, 1978-present

Member, Career and Education Committee, 2000-2008

Member, Research Advisory Committee, 1983-present

Member, Board of Directors, Superior Chapter, 1978-88, 91-92, 2003-present

Chair, Research Advisory Committee, 1989-91

Member, Board of Directors, 1986-88, 91-92

Founding Chair, Plant Protection Issues Committee, 1988-89

Member, Plant Protection Issues Committee, 1988-1994

Founding Member, Legislative and Regulatory Committee, 1988-90

Secretary, Superior Chapter, 1981-84, 2004-07

President, Superior Chapter, 1986-87

President Elect, Superior Chapter, 1985-86

Vice President, Superior Chapter, 1984-85

Member, American Society of Horticultural Science, 1999-present

Member, International Society of Horticultural Science, 1999-present

Member, American Nursery and Landscape Association, 2002-present

Member, California Landscape Contractors' Association, 2005-present

Member, Society of Environmental Toxicology and Chemistry, 2007-present

Member, American Chemical Society, 2009-present

Curriculum Vitae

**Karey Windbiel-Rojas**

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(530) 750-4241 / (916) 832-8471

kwindbiel@ucanr.edu

**Experience**

**University of California, Davis**

**Statewide Integrated Pest Management Program**

Associate Director for Urban and Community IPM

*October 2014 - present*

- Direct and coordinate the activities of the Urban and Community IPM Program and coordinate statewide outreach.
- Collaborate with teams of UC academic experts, IPM Advisors, and clientele groups to identify and prioritize important urban IPM issues and ways to address them.
- Develop new and existing partnerships with professional organizations, community groups, agencies and identifies key players to be involved in UC IPM planning and promotion of UC IPM products and messages.
- Identify potential funding sources and partners and prepares grant proposals to support activities and meet identified priorities of the Urban and Community IPM program.
- Prepare annual program budget and work plan.
- Develop and deliver outreach materials and training programs and also conducts systematic review of program materials to assure that they are up-to-date and meeting clientele needs.

**University of California, Davis**

**Statewide Integrated Pest Management Program**

Urban and Community IPM Coordinator/Educator

*March 2006 - October 2014*

- Assist in coordinating the development Urban and Community IPM program's annual work plan based on strategic planning goals, evaluation of current programs and needs and input from stakeholders and collaborators within UCANR.
- Design and implements assessment tools to evaluate effectiveness of UC IPM urban education and outreach programs.
- Analyze data and produces summary reports. Uses results of evaluation to update priorities and direct Urban IPM program efforts as appropriate.
- Assures currency of urban content on UC IPM web site through regular review and evaluation and work with appropriate IPM experts and IT staff to update material.
- Reviews urban program educational materials, including publications and multimedia, on a systematic basis to assure accuracy and currency of content and identify gaps. Coordinates dissemination and inventory of materials for urban audiences.
- Provide science-based educational materials and resources to urban audiences throughout California on environmentally friendly pest management for the home and landscape.
- Support county UC Master Gardener programs by providing UC IPM printed materials, training and outreach materials, scheduling IPM kiosk use, and sharing other UC

#### Curriculum Vitae

publications and resources. Extend IPM and pesticide safety information to approximately 400 UC Master Gardener volunteers annually during in-county training and classes.

- Collaborate with county UCCE advisors, campus-based academics, program representatives, public agencies, UC Master Gardener volunteers, and other community groups on projects and outreach programs.
- Coordinate statewide regional train-the-trainer workshops for UC Master Gardeners and retail nursery and garden center employees. Responsible for teaching sessions, arranging registration, workshop promotion, catering, audiovisual equipment, and all other logistics.
- Develop content for, edit, and proofread UC IPM's urban Web page section.
- Participate in stakeholder meetings, advisory committees, and various project committees to develop and implement innovative and creative ideas for extending information to urban audiences.
- Write articles and assist with production of quarterly newsletters for retail nursery industry and landscape/structural professionals.
- Analyze and summarize data for reports. Assist in budget analysis, grant writing and preparation of written reports.

#### University of California, Davis Department of Entomology, Godfrey Lab

*Graduate Student Researcher*

*May 2003 - March 2006*

- Conducted research on biological control of the Egyptian alfalfa weevil in various locations throughout California.
- Partnered with numerous UCCE Farm Advisors to gather samples and data for research projects and conduct local field days to extend information to growers.
- Delivered research findings during field days, workgroup meetings, and various conferences and symposia.
- Assisted in writing proposals and reports for Environmental Protection Agency grants to fund graduate research projects.
- Assisted in the investigation of effects of various insecticides on target and nontarget invertebrates in California rice fields.
- Supervised several students for two seasons of annual summer field research work.
- Other duties included maintenance of greenhouse plants, maintaining insect colonies reared on lab media, assisting PI with other projects as needed.

#### Peace Corps Volunteer Republic of Ghana, West Africa

*Science Teacher, Community Organizer*

*June 1999 - July 2001*

- Taught general science and elective biology to approximately 400 secondary students in a rural community school.
- Advisor to three youth clubs, focusing on gender equality, environmental issues, community involvement, HIV/AIDS education, family planning and youth leadership.
- Facilitated regional train-the-trainer workshops for other Peace Corps Volunteers and host country nationals on HIV/AIDS education and Gender and Youth Development.
- Developed, organized, and obtained grant funding for an innovative bicycle tour program to deliver HIV/AIDS training and educational materials to adults in rural communities. Program continued for 2 years after my close of service.

### Curriculum Vitae

- Obtained grant funding to develop a community-driven project to reconstruct existing school laboratory facilities with the support of local funding agencies, local contractors and labor, tribal leaders, and school and community involvement.
- Worked with indigenous community leaders, local school administrators, teachers, and Peace Corps advisors on a variety of other non-funded secondary projects.
- Received training in cross-cultural diversity, leadership, and community-driven project management.

### Education

#### University of California, Davis

#### Department of Entomology

#### Integrated Pest Management

September 2003 - March 2006

#### Master of Science

- Coursework included Concepts in Pest Management, Plant Pathology, Statistics, Environmental Toxicology, Weed Science, and Entomology.
- Thesis and research project title: *Assessment of Biological Control and Sampling Methods of the Alfalfa Weevil Complex in California Alfalfa.*
- Assisted in writing grants and reports.
- Graduate Student Association representative for IPM graduate group.
- Linnaean Games team member for Pacific Branch and Annual Entomological Society of America meetings, 2004.
- Presented papers and posters at various symposia and agricultural field days.

#### California Polytechnic State University, San Luis Obispo

#### Biological Sciences

June 1994 - December 1998

#### Bachelor of Science

- Courses included Plant Biology, Plant Taxonomy, Ecology, Plant Physiology, Chemistry, Entomology, Cell Biology, Genetics, Urban Gardening, Statistics.
- Senior Project study on population dynamics of the Western Pond Turtle in the lower Sierra Mountains, Kings County, CA. Conducted a mark and recapture study of current and previous population of turtles with relation to environmental changes.

### Publications

Windbiel-Rojas, K. 2014. Excluding Migratory Birds from Buildings. *Retail Nursery and Garden Center IPM News*, Vol 4, No. 3.

Perry, E.J. and K. Windbiel-Rojas. 2014. Pest Notes: *Boxelder Bug*. Univ. Calif. Agri. Nat. Res. Publ. 74114. <http://www.ipm.ucdavis.edu/PMG/PESTNOTES/pn74114.html>

Windbiel-Rojas, K. 2013. Using Traps and Barriers for Insects and Other Pests. *Retail Nursery and Garden Center IPM News*, Vol 3, No. 3.

## Curriculum Vitae

Windbiel-Rojas, K. 2012. Tools for Removing Dandelions and Other Weeds. *Retail Nursery and Garden Center IPM News*. Vol. 2, No. 2.

Strand, L.L., S. Dreifstadt, M.L. Flint, K. Windbiel-Rojas. 2009. Landscape Pest Identification Cards. *Univ. Calif. Agri. Nat. Res Publ.* 3513.  
<http://anrcatalog.ucdavis.edu/Details.aspx?itemNo=3513>

Godfrey, L., K. Windbiel, R. Lewis, D. Putnam, M. Canevari, S. Orloff, D. Marcum, J. Schmiterer, R. Long, D. Bayland, and R. Vargas. 2004. Refinements of Integrated Pest Management Strategies for Alfalfa Weevils in California. *Alfalfa. Proceedings of 34<sup>th</sup> California Alfalfa and Forage Symposium & National Alfalfa Symposium*. San Diego, CA.  
<http://alfalfa.ucdavis.edu/+symposium/proceedings/2004/04-65.pdf>

Godfrey, L., K. Windbiel-Rojas, R. Lewis, D. Putnam, M. Canevari, C. Frate, D. Marcum, S. Orloff, and J. Schmiterer. 2005. Alfalfa Weevils: A New Look at an old pest. *Proceedings of 35<sup>th</sup> Alfalfa and Forage Symposium*. Visalia, CA.  
<http://alfalfa.ucdavis.edu/+symposium/proceedings/2005/05-103.pdf>

Windbiel, K. and L.D. Godfrey. Current Status of Biological Control of Alfalfa Weevils in California. 2005. *Proceedings of 35<sup>th</sup> Alfalfa and Forage Symposium*. Visalia, CA.  
<http://alfalfa.ucdavis.edu/+symposium/proceedings/2005/05-97.pdf>

Windbiel, K. C., L.D. Godfrey, and R.R. Lewis. 2004. Assessing the incidence of parasitoids of the Egyptian alfalfa weevil, *Hypera brunneipennis* in California alfalfa. *California Conference on Biological Control IV*, Berkeley, California. 13-15 July, 2004: 162-165  
<http://www.cnr.berkeley.edu/biocon/Proceedings%20Addendum%20CCBC%20IV.pdf>

Godfrey, L. D., K. C. Windbiel, and R. R. Lewis. 2004. Influence of insecticide applications on non-target fauna in rice systems. *Calif. Rice Experiment Station Field Day Report*. pp 11-12.

### Publications in Progress

Windbiel-Rojas, K., L.D. Godfrey, R.R. Lewis, S. Orloff, R.F. Long. Survey of Biological Control of Alfalfa Weevil Complex (Coleoptera: Curculionidae) in California. Submission aimed at *California Agriculture*.

Windbiel-Rojas, K., M.L. Flint, J.A. Azulai. Integrated Pest Management Educational Needs of Retail Nursery and Garden Centers. Submission aimed at *Journal of Extension*.

### Presentations and Posters

Godfrey, L.D., R. Lewis, W. Pinkston, and K. Windbiel-Rojas. 2008. Impact of Management Strategies for Rice Water Weevil on Populations of Non-Target Invertebrates in California Rice. *Proceedings of 32<sup>nd</sup> Rice Technical Working Group Meeting*. San Diego, CA.  
<http://www.plantsciences.ucdavis.edu/rtwg/docs/RTWG%20Program-b.pdf>

Curriculum Vitae

Godfrey, L.D., R. Lewis, K. Windbiel-Rojas, and W. Pinkston. 2007. Impact of Management Strategies for Rice Water Weevil on Populations of Non-Target Organisms in California Rice. Entomological Society of America Pacific Branch Conference.  
<http://www.entsoc.org/PDF/Pacific/PDF/2007/PB2007Program.pdf>

Pinkston, W., Lewis, R., Windbiel-Rojas, K. and Godfrey, L. D. 2008. Poster: Influence of Rice Seeding and Establishment Methods on the Populations of Rice Water Weevil and Larval Mosquitoes. 32<sup>nd</sup> Rice Technical Working Group Meeting, San Diego, CA.  
<http://www.plantsciences.ucdavis.edu/rtwg/docs/RTWG%20Program-b.pdf>

Windbiel, K. C., L. D. Godfrey, and R. R. Lewis. 2004. Assessing the incidence of parasitoids of the Egyptian alfalfa weevil (*Hypera brunneipennis*) in California alfalfa. Entomological Pacific Branch Annual Meeting.  
<http://www.entsoc.org/PDF/2004/2004PBESAProgramBozeman.pdf>

Authored grants

2013—Western IPM Center Award (\$10,000)

2011—DPR Pest Management Alliance Grant IPM Advocates (\$200,000)

<http://www.cdpr.ca.gov/docs/pestmgmt/grants/final-reports/ipm-advocates.pdf>

Awards and Honors

2014—Division of Agriculture and Natural Resources Staff Appreciation and Recognition Award (STAR)

2013—Dept. of Pesticide Regulation's IPM Innovator Award for IPM Advocates Program

2005—UCD Graduate Student Award Travel Grant to Entomological Society of America Meeting (\$500)

2004—Henry A. Jastro and Peter Shield Student Award (\$1500)

2003—MacBeth Student Fellowship (\$1000)

2003—EPA Region 9 Pesticide Environmental Stewardship Program (PESP)(\$40,000)

**Exhibit B**

**Budget Estimate for Project Period**

**Budget Estimate for Project Period 2/1/2016 to 12/31/2018**

		FY 15-16				FY 16-17				FY 17-18			
		Monthly Base	5 mos	12 mos	12 mos	12 mos	12 mos	12 mos	12 mos	TOTAL			
<b>Personnel</b>													
CE Specialist -Loren Oki (5%)	Salary	\$ 7,650.00	\$ 1,912.50	\$ 4,333.73	\$ 4,463.74	\$ 10,709.96							
(11 months/FY)	Benefits		\$ 724.84	\$ 1,659.82	\$ 1,763.18	\$ 4,147.83							
SRA I - Jared Sisneroz (15%/10%)	Salary	\$ 3,504.36	\$ 2,628.27	\$ 4,331.39	\$ 3,717.78	\$ 10,677.43							
(5 mos/12 mos/10 mos))	Benefits		\$ 1,350.93	\$ 2,243.66	\$ 1,925.81	\$ 5,520.40							
Jr Specialist (50%/75%/79%)	Salary	\$ 3,036.00	\$ 7,590.00	\$ 28,143.72	\$ 30,534.06	\$ 66,267.78							
(12 months/FY)	Benefits		\$ 2,876.61	\$ 10,779.04	\$ 11,694.54	\$ 25,350.20							
<b>Subtotal Personnel</b>			\$ 17,083.15	\$ 51,491.35	\$ 54,099.10	\$ 122,673.60							
<b>Travel</b>													
	Domestic		\$ 2,500.00	\$ 2,100.00	\$ 2,000.00	\$ 6,600.00							
	International		\$ -			\$ -							
<b>Sub Total Travel</b>			\$ 2,500.00	\$ 2,100.00	\$ 2,000.00	\$ 6,600.00							
<b>Other Direct Costs</b>													
	Outreach Costs*		\$ 3,500.00	\$ 4,000.00	\$ 2,500.00	\$ 10,000.00							
	Transportation					\$ -							
	Equipment					\$ -							
	Supplies		\$ 2,000.00	\$ 2,500.00	\$ 1,911.00	\$ 6,411.00							
	Pub Costs					\$ -							
	Land Use					\$ -							
	Consult Ser					\$ -							
	ADP/Comp					\$ -							
	Equip. Rental					\$ -							
	Alt & Renov					\$ -							
	Grad Fees (1 Student)		\$ -			\$ -							
<b>Sub Total Other Direct Costs</b>			\$ 5,500.00	\$ 6,500.00	\$ 4,411.00	\$ 16,411.00							
<b>Total Direct Cost</b>			\$ 25,083.15	\$ 60,091.35	\$ 60,510.10	\$ 145,684.60							
<b>Total Indirect Cost</b>			\$ 6,270.79	\$ 15,022.84	\$ 15,127.53	\$ 36,421.15							
<b>Total MIDC</b>						0.0							
<b>TOTAL</b>			\$ 31,353.94	\$ 75,114.19	\$ 75,637.63	\$ 182,105.76							
<b>ANR Subcontract (incl indirect costs)</b>			\$ 5,009.15	\$ 11,901.69	\$ 9,174.14	\$ 26,084.98							
<b>GRAND TOTAL</b>			\$ 36,363.09	\$ 87,015.88	\$ 84,811.77	\$ 208,190.74							

## Exhibit B1

### Budget Justification

*The Budget Justification will include the following items in this format.*

#### Personnel

**Name.** Starting with the Principal Investigator list the names of all known personnel who will be involved on the project for each year of the proposed project period. Include all collaborating investigators, individuals in training, technical and support staff or include as "to be determined" (TBD).

Principal Investigator: Loren Oki, CE Specialist  
Co-Principal Investigator: Karey Windbiel-Rojas, UC IPM CE Advisor  
SRA I: Jared Sisneroz  
Jr Specialist: TBD  
Student Assistance: TBD

**Role on Project.** For all personnel by name, position, function, and a percentage level of effort (as appropriate), including "to-be-determined" positions.

Name/Role	Percent Annual Effort
Principal Investigator: Loren Oki, CE Specialist	(5%, 5%, 5%)
Co-Principal Investigator: Karey Windbiel-Rojas, UC IPM CE Advisor	(5%, 5%, 5%)
SRA I: Jared Sisneroz	(15%, 10%, 10%)
Jr Specialist: TBD	(50%, 75%, 79%)
Student Assistance: TBD	(20%, 20%, 10%)

#### Fringe Benefits.

*In accordance with University policy, explain the costs included in the budgeted fringe benefit percentages used, which could include tuition/fee remission for qualifying personnel to the extent that such costs are provided for by University policy, to estimate the fringe benefit expenses on Exhibit B.*

Name/Role	Annual Benefit Percentage
Principal Investigator: Loren Oki, CE Specialist	(41%, 42%, 42%)
Co-Principal Investigator: Karey Windbiel-Rojas, UC IPM CE Advisor	(41%, 42%, 42%)
SRA I: Jared Sisneroz	(51%, 51.8%, 51.8%)
Jr Specialist: TBD	(38%, 38%, 38%)
Student Assistance: TBD	(1%, 1%, 1%)

#### Travel

*Itemize all travel requests separately by trip and justify in Exhibit B1, in accordance with University travel guidelines. Provide the purpose, destination, travelers (name or position/role), and duration of each trip. Include detail on airfare, lodging and mileage expenses, if applicable. Should the application include a request for travel outside of the state of California, justify the need for those out-of-state trips separately and completely.*

Travel necessary to conduct a minimum of three workshops/training sessions for PCOs and a seminar at DPR in Sacramento at the conclusion of the contract.

#### Materials and Supplies

*Itemize materials supplies in separate categories. Include a complete justification of the project's need for these items. Theft sensitive equipment (under \$5,000) must be justified and tracked separately in accordance with State Contracting Manual Section 7.29.*

#### Equipment

*List each item of equipment (greater than or equal to \$5,000 with a useful life of more than one year) with amount requested separately and justify each.*

N/A

#### Consultant Costs

*Consultants are individuals/organizations who provide expert advisory or other services for brief or limited periods and do not provide a percentage of effort to the project or program. Consultants are not involved in the scientific or technical direction of the project as a whole.*

*Provide the names and organizational affiliations of all consultants. Describe the services to be performed, and include the number of days of anticipated consultation, the expected rate of compensation, travel, per diem, and other related costs.*

N/A

**Subawardee (Consortium/Subrecipient) Costs**

*Each participating consortium organization must submit a separate detailed budget for every year in the project period in Exhibit B2 Subcontracts. Include a complete justification for the need for any subawardee listed in the application.*

ANR Subcontract: Subcontract to UC ANR to support Karey Windbiel-Rojas as co-principal investigator for the project. Includes indirect costs of UC ANR.

**Other Direct Costs**

*Itemize any other expenses by category and cost. Specifically justify costs that may typically be treated as indirect costs. For example, if insurance, telecommunication, or IT costs are charged as a direct expense, explain reason and methodology.*

**Rent**

*If the scope of work will be performed in an off-campus facility rented from a third party for a specific project or projects, then rent may be charged as a direct expense to the award.*

N/A

**Indirect (F&A) Costs**

*Indirect costs are calculated in accordance with the University budgeted indirect cost rate in Exhibit B.*

Indirect Costs - Rate 25% of Total Direct Costs

Exhibit B2

Budget Estimates Pertaining to Subcontractors (when applicable)

Principal Investigator (Last, First) Oki, Lorence R.

		Monthly	FY 15-16	FY 16-17	FY 17-18	TOTAL
		Base	5 mos	12 mos	12 mos	
<b>Personnel</b>						
UC IPM CE Advisor (5%)	Salary	\$ 5,850.67	\$ 1,462.67	\$ 2,711.79	\$ 2,793.14	\$ 6,967.59
(9 months/FY)	Benefits		\$ 599.69	\$ 1,141.66	\$ 1,212.22	\$ 2,953.58
Student Assistance (20%/10%)	Salary	\$ 1,920.00	\$ 1,920.00	\$ 4,608.00	\$ 2,304.00	\$ 8,832.00
(12 months/FY)	Benefits		\$ 24.96	\$ 59.90	\$ 29.95	\$ 114.82
<b>Subtotal Personnel</b>			\$ 4,007.32	\$ 8,521.35	\$ 6,339.31	\$ 18,867.99
<b>Travel</b>	Domestic		\$ -	\$ 500.00	\$ 500.00	\$ 1,000.00
	International		\$ -			\$ -
<b>Sub Total Travel</b>			\$ -	\$ 500.00	\$ 500.00	\$ 1,000.00
<b>Other Direct Costs</b>	Outreach Costs*		\$ -	\$ 500.00	\$ 500.00	\$ 1,000.00
	Transportation					\$ -
	Equipment					\$ -
	Supplies		\$ -	\$ -	\$ -	\$ -
	Pub Costs					\$ -
	Land Use					\$ -
	Consult Ser					\$ -
	ADP/Comp					\$ -
	Subawards					\$ -
	Equip. Rental					\$ -
	Alt & Renov					\$ -
	Grad Fees (1 Student)		\$ -			\$ -
<b>Sub Total Other Direct Costs</b>			\$ -	\$ 500.00	\$ 500.00	\$ 1,000.00
	<b>Total Direct Cost</b>		\$ 4,007.32	\$ 9,521.35	\$ 7,339.31	\$ 20,867.99
	<b>Total Indirect Cost</b>		\$ 1,001.83	\$ 2,380.34	\$ 1,834.83	\$ 5,217.00
	<b>Total MTDC</b>					0.0
	<b>GRAND TOTAL</b>		\$ 5,009.15	\$ 11,901.69	\$ 9,174.14	\$ 26,084.98

### **Exhibit B3**

#### **Invoice and Detailed Transaction Ledger Elements**

In accordance with Section 14 – Payment and Invoicing, the invoice, summary report and/or transaction/payroll ledger shall be certified by the University's Financial Contact and the PI.

**Summary Invoice – includes either on the invoice or in a separate summary document – by approved budget category (Exhibit B) – expenditures for the invoice period, approved budget, cumulative expenditures and budget balance available<sup>1</sup>**

- Personnel
- Equipment
- Travel
- Subawardee – Consultants
- Subawardee – Subcontract/Subrecipients
- Materials & Supplies
- Other Direct Costs
  - TOTAL DIRECT COSTS (if available from system)
- Indirect Costs
  - TOTAL

**Detailed transaction ledger and/or payroll ledger for the invoice period <sup>2</sup>**

- Univ Fund OR Agency Award # (to connect to invoice summary)
- Invoice/Report Period (matching invoice summary)
- GL Account/Object Code
- Doc Type (or subledger reference)
- Transaction Reference#
- Transaction Description, Vendor and/or Employee Name <sup>6</sup>
- Transaction Posting Date <sup>6</sup>
- Time Worked <sup>6</sup>
- Transaction Amount <sup>6</sup>

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<sup>1</sup> If this information is not on the invoice or summary attachment, it may be included in a detailed transaction ledger.

<sup>2</sup> For salaries and wages, these elements are anticipated to be included in the detailed transaction ledger. If all elements are not contained in the transaction ledger, then a separate payroll ledger may be provided with the required elements.