<table>
<thead>
<tr>
<th>College</th>
<th>Loma Linda University</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faculty</td>
<td>Dr. Ryan G. Sinclair</td>
</tr>
<tr>
<td>Project #106</td>
<td>Eastern Coachella Crowd Sourcing: Empowering youth to advocate for improved wastewater management</td>
</tr>
</tbody>
</table>
A. COVER PAGE

1. COLLEGE:
Loma Linda University School of Public Health
Department of Environmental Health and Geoinformatic Sciences

2. PROJECT TITLE:
Eastern Coachella Crowd Sourcing: Empowering youth to advocate for improved wastewater management.

3. PROJECT STRAND:
LOCAL: A communications strategy project in the Coachella Valley of Riverside County.

4a. FACULTY PROJECT MANAGER:
Ryan G. Sinclair PhD, MPH

4b. GRADUATE STUDENT PROJECT MANAGERS:
Travis You, MPH(c)
Melisa Custer, MPH(c)
Diane GarciaGonzales, MPH(c)
Diana Ibrahim, MPH(c)
B. PROJECT SUMMARY PAGE:
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SUMMARY

The mobile home park communities of the Eastern Coachella Valley (ECV) face many Environmental health challenges. Problems go unreported for months because residents fear eviction, deportation, or their mobile home receiving the infamous “red tag” which prevents them from inhabiting their home. One of these underreported environmental injustices is the widespread occurrence of failing wastewater management. A comprehensive and continuously updated map of the mobile home parks will be coupled with youth reported map reports of the wastewater problems. Young adults will be trained on crowd sourcing as a method to identify problems and find solutions. The youth’s work will be organized through the promotoras network and be verified/validated by a selected panel of LLU students, faculty, and some of area stakeholders.
## C. CONTACT INFORMATION PAGE:

1. **College**: Loma Linda University School of Public Health Department of Environmental Health and Geoinformatic Sciences  
   **Address**: 24951 N. Circle Drive, Loma Linda University  
   **City, State, Zip Code**: Loma Linda, California, 92354  
   **Make Check Payable to**: Loma Linda University

2. **Application Strand**: Communications Strategy  
   **LOCAL Project Name**: Eastern Coachella Crowdsourcing: Empowering youth to advocate for improved wastewater management.

3. **Student Project Manager**: Melisa Custer, MPH (c)  
   **Graduate**: Graduate Student and SWAT club Secretary  
   **Department**: Environmental Health and Geoinformatic Sciences  
   **Cell Phone / Email Address**

4. **Faculty Project Manager**: Ryan G. Sinclair PhD, MPH  
   **Title**: Assistant Professor  
   **Department**: Environmental Health and Geoinformatic Sciences  
   **Telephone / Email Address**: 909.558.4000 x47128 rsinclair@llu.edu
D. ORGANIZATIONAL BACKGROUND
LLU is a nationally-known health sciences institution with over 3,000 students, situated in one of the fastest growing areas in the US. The University is affiliated with the Loma Linda University Medical Center (LLUMC). LLUMC operates some of the largest clinical programs in the U.S. in areas such as neonatal care, and is recognized as the international leader in infant heart transplantation and proton treatments for cancer. LLU has Schools of Medicine, Dentistry, Public Health, Nursing, Pharmacy, Allied Health Professions, Religion and a School of Science and Technology (SST). LLU offers primarily professional and graduate degrees.

While LLU is a small private university, it has a long history of excellence in teaching health science professionals (it recently celebrated its centennial), and a demonstrated commitment to research addressing the needs of high-risk populations. LLU has received funding through federal (CDC, NIH), state, community and private funding sources to study a variety of issues such as teenage pregnancy, air quality, and health disparities. External support for these research activities is currently amounting to $35.7 million, with $29.4 million in total competitive extramural funding and $15 million in NIH funding.

School of Public Health
The LLU School of Public Health has been in existence since 1967, and currently offers master’s level degrees in biostatistics, epidemiology, environmental health, global health, health policy and leadership, nutrition, preventive care, public health practice, and business administration. Doctoral degrees are given in epidemiology, global health, health policy and management, health education, nutrition, and preventive care. LLU-SPH has an established reputation in translational research, and a history of partnering with local community organizations to conduct needed health research in nearby San Bernardino with underserved groups such as African Americans and the city’s burgeoning Latino population. In 2009, the school was awarded a four-year grant from the Centers for Disease Control to prepare San Bernardino neighborhoods for emergencies and natural disasters. Other research focuses on diabetes management and obesity prevention for Latinos, and prostate cancer education for African American men. At the request of concerned San Bernardino residents, the school submitted and won a 2010 grant from the Southern California Air Quality Management District to study the health effects of railyards on residents living nearby.

Facilities
LLU will provide the overall support structure for the proposed training and communication activities, including the computer infrastructure, office space and administrative support. LLU is one hour from the project area and offers an optimal place for project preparation and planning. Facilities include computer labs, a water and wastewater microbiology laboratory and student computer workrooms to accommodate individual projects.

Geoinformatics
The Loma Linda University School of Public Health is a premiere provider of health geoinformatics training and education. To date, LLU SPH has demonstrated leadership in the health geoinformatics field by achieving three important GIS educational "firsts." In 1996 School faculty designed and taught the first graduate-level GIS course offered at a U.S. School of Public Health. This was followed by launching the country's first health geographics bachelor's degree in 1998. Then a graduate-level certificate in health geoinformatics, designed to complement existing degrees or be offered as professional continuing education, was subsequently approved by the University and has been offered since autumn 2004. Since then, three additional GIS tracts have been approved in the areas of Global Health and Development, Business Administration, and Environmental Health. The geoinformatics
laboratory has a specialty area in water distribution systems. The laboratory is also key in preparation of crowdsourcing intervention design and the subsequent verification, validation, and spatial analysis of crowdsourced data. The University is a partner with the Imperial County and Eastern Coachella Valley Environmental Justice Task Force and has contributed maps to the task force’s mobile home park mapping efforts. This proposal’s goal is to improve the crowd sourcing efforts, which are currently organized by the task force. These activities will be coordinated through the geoinformatics laboratory.

The Safe Water Action Team
The LLU Safe Water Action Team (SWAT) club is a student initiated water and sanitation club. The SWAT student club holds quarterly certificate oriented workshops which focus on water, sanitation, and water conservation. The SWAT club has a purpose (a) to foster a broad student interest in water sanitation issues by providing leadership, programs, and service and (b) to assist students in developing skills and leadership in water sanitation issues. The student team leader is also the SWAT club president.
E. PROJECT DESCRIPTION (7 – 10 PAGES)

I. INTRODUCTION
The mobile home park communities of the Eastern Coachella Valley (ECV) face many Environmental health challenges. These mobile home parks have electrical, water, and wastewater infrastructure which is often tenuous or otherwise unapproved. News articles in the press enterprise and Desert Sun have documented failing wastewater management, month long electrical outages, drinking water contamination, illegal dumping, uncertain home lease tenure and many other health stressors, which make life difficult in the desert (Flaccus, 2011; Honoré, 2011; Editorial, 2011; Rincon, 2011; Yehle, 2011). Families want improvements, but are reluctant to discuss their problems with any organization that could jeopardize their stability and current livelihood.

Problems go unreported for months because residents fear eviction, deportation, or their mobile home receiving the infamous “red tag” which prevents them from inhabiting their home. Many of the families in these mobile home parks are renters who do not speak English; they are reluctant to report problems or receive services because they fear their landlords, their agricultural employers and the US government. A true human rights injustice occurs when these families are exposed to high concentrations of environmental contaminants, while at the same time, they fear reporting or communicating their problems to anyone.

1a. Water related challenge
One of these underreported environmental injustices is the widespread occurrence of failing wastewater management. Although the specific prevalence of this problem in the ECV is unknown, a recent observational sanitary survey by the author found that this problem exists in seven out of the seven ECV mobile home parks visited (Sinclair, 2011). An on-site wastewater system failure was defined by the USEPA as hydraulic failures causing puddling, backed up plumbing or water resource contamination (USEPA, 2011). This is linked to soil-based systems being installed at sites with inadequate or inappropriate soils, excessive slopes or high ground water tables.

Reducing exposure to wastewater is the most significant advancement in public health made in the last 100 years (Novick, 2005). Wastewater flowing in open trenches of the ECV in 2011 is equivalent to a public health standard common in the early 1900’s. This proposal’s principle long-term goal is to improve the health and quality of life among residents of the ECV by reducing their exposure to wastewater management failures. The project proposes area youth as the key to document this exposure. Tools made available to youth include everything necessary for successful crowdsourcing. Youth will be instructed how to document and map their communities environmental health risks by using their smart phones, digital cameras, and their voices.

Environmental Justice Task Force
A recent movement in the California desert is the Eastern Coachella Valley Environmental Justice task force (ECVEJ). The ECVEJ has a mission to protect health and manage natural resources for future generations (CRLA, 2011). This task force is organized by an emerging network of community-based organizations (CBOs), government representatives, and advocacy groups. The task force promotes a “smart advocacy” which empowers local communities to express their concerns while protecting their livelihood and strategically building evidence for community-oriented environmental health improvements.

1c. Communications and data collection
One challenge to properly address EJ issues is to validate the concern through scientifically defensible data. Many groups have chosen the Promotora de Salud model (Balcázar, 2009; English, 2011) where community representatives are trained in key health topics who then train and empower local communities. The promotora model also works for reporting data; promotoras can conduct survey questionnaires and even organize environmental data collection. These are promising advances,
but the communication challenge still exists. Advocating for these communities is difficult when they are reluctant to describe their problems. Promotoras have demonstrated success in many public health projects (Koch, 1998), but the approach is still very young in its communication strategy. The communication issue is aggravated by the other major challenge: diffuse and undocumented locations of the mobile home parks. To defensibly report EJ issues such as the failing wastewater systems, a comprehensive and continuously updated map of the mobile home parks needs to be coupled with map reports of the environmental problems.

These two challenges are best addressed through this project’s planned work with school-age advocates. Young adults will be trained on crowd sourcing and photo voice as a method to document their community and some of its challenges. The data will report where the disadvantaged communities are and what environmental justice issues they experience. The project will focus on wastewater management failures, but will be open for youth to report other problems. The goal will be to have youth document EJ issues and Environmental Health hazards. The youth’s work will be organized through the promotoras network and be verified/validated by a selected panel of LLU students, faculty, and some of the ECVEJ members.

2. GOALS and OBJECTIVES

2a. Water-related issue or challenge
This project’s principal long-term goal relates to equitable access to sanitation and health. This is a “global” wastewater and sanitation project in California. We address water conservation from the watershed contamination perspective. There are serious wastewater pollution issues in the eastern Coachella valley, the Coachella valley, the high desert and imperial county. These issues affect the watershed on a large scale. As an example of this, the city of Canyon Lake in Riverside county. This affluent community is just beginning to experience the water contamination that occurs when disadvantaged communities are neglected. Part of Canyon lake’s contamination has been attributed to the failing septic tank systems in the upstream disadvantaged community of Quail Valley. As population increases, our susceptibility to watershed contamination also increases. If long range water resource planning is a goal of the MWD, watershed-wide wastewater contamination needs to be addressed in disadvantaged communities.

2b. Is it a local or global focus per the RFP guidelines?
This project is a local project in Riverside County, but may qualify for funding under the global project title. There are two reasons for this: (1) the sanitation issues being experienced in these areas are considered problems typical of developing nations and water-stressed regions and (2) there is no MWD water agency servicing the regions addressed in this proposal.

The target population is mobile home parks located on tribal lands, private land and unincorporated areas in riverside county California. There are local member water agencies in Riverside County, but none of these agencies work in the areas identified for this project. This local project addresses sanitation and hygiene conditions similar to global projects in poor areas of developing countries. Because of this we are not exclusively partnering with a water agency, but are informing the riverside county through personal communication with John Watkins of Riverside County Department of Environmental Health. John Watkins and Ryan Sinclair teach an environmental health course in the winter of 2012. John Watkins has made GIS resources of the county available for an earlier arsenic water projects in the eastern Coachella Valley (see email in letters of support appendix). Upon funding, the team will make an announcement during the Environmental Justice task force of the Eastern Coachella Valley.

This project has a similar goal to that of the UN’s Millennium Development Goals in regards to sanitation (UNICEF, 2009). Local area youth can be the agents of change to make a difference in
terms of sanitation. A project specific, and modified UNMDG goal would be to halve the number of people without equitable access to a functioning sewer system.

2c. Content Strand: communications as a research focus
Residents of mobile home parks in the eastern Coachella valley often have failing or inadequate on site wastewater management systems. The conventional solution for many of these trailer parks is a sanitary sewer. Unfortunately, this is a very expensive option, which simply isn’t practical for a rural trailer park located miles away from the nearest main sewerage. Because of this difficulty, many area utilities and community-based organizations are unable to provide support for this growing population. Consequently, residents neglect wastewater as a priority and rely on short-term solutions such as frequent emergency pumping of septic tanks, diverting wastewater to abandoned irrigation canals or using lagoons beyond their designed capacity. The problem is widespread and it is estimated that thousands of individuals in Riverside county are exposed to pathogens in wastewater. A necessary solution to this is to document and educate community members about the problem. A communications strategy can be used to create awareness and educate, but it can also be used to document the problem. Crowd sourcing is the best way to address the issue. The issue is widespread and still largely undocumented.

The target audience for this crowd sourcing is Eastern Coachella Valley youth. We intend to train any youth with a basic understanding of digital cameras and GPS. We will train them how to identify wastewater problems and other environmental health concerns. They will then report these issues on a website which will be verified and validated by student members of this team. We will use local promotoras who are members of two different promotora organizations. We will also work with, Pueblo Unida, a local infrastructure support agency who has a training center for training on wastewater and water quality in the Eastern Coachella Valley.

The crowd sourced data will populate a website very similar to ivanonline.org. Graduate Students in the LLU SWAT club will verify and validate the entries. A student with photography skills will combine photos collected from the ECV youth to help develop a photovoice component of the intervention.

This proposal aims to train 40 school-aged youth in the ECV who pass a selection criteria test. The test shows that they have a required minimum awareness of smart phones, GPS systems on phones, text messaging, and digital photography. The effectiveness of the training will be evaluated through a pre/post test, but also the resulting website entries. A group of the students will work on a photovoice subproject to advocate for their communities an create a series of 3 related videos that they will establish as a channel on YouTube.

2d. Anticipated outcome of research

GOAL: improve the health and quality of life among residents of the ECV by reducing their exposure to wastewater management failures

Short-Term outcome objectives
• At the completion of the program, 50% of all participating students will be possess a basic knowledge of crowdsourcing, on-site wastewater system failures, and how to collect systematic research data.
• 100% of all participating promotoras will be possess a refined knowledge of crowdsourcing and know how to recognize wastewater system failures in mobile home parks of the Coachella desert.
• 60% of all data collected by participating youth will be uploaded and shared on a crowdsourcing website.
80% of all mobile home parks in the Eastern Coachella Valley will be identified in this crowd sourced map and the data will be publically available.

At the completion of the program, 50% of all participating students will be able to conduct a microbial test on wastewater using colilert™ indicator kits.

Long-term outcome objectives

- Reduce the amount of failing wastewater infrastructure in the Eastern Coachella Valley.
- Improve the health and quality of life of residents of the ECV through equitable access to sanitation.
- Reduce the risk of contracting pathogens or other opportunistic bacteria from the area wide wastewater failures.

3. METHOD:
3a. Where the research and data collection takes place: Project Benefits and Target Audience

SWAT students will work with promotoras and students from the Coachella Valley. The project will utilize Pueblo Unida’s training facility on Pierce street and CA-125 to train promotoras as group leaders and 40 area students. Local schools will be contacted to find interested and qualifying students. Students will be asked to travel in their local community and take photographs and GPS coordinates of suspected environmental hazards. There will be a special emphasis on wastewater failures. Students will collect the data and upload it to the ivanonline website. Youth participants will be asked to stay in their local communities and only travel to new ones if project coordinators determine that those areas do not have representative youth.

The project will start with one youth participant per mobile home park. Mobile home parks range from 3 households to 200, so the number of impacted individuals could be anywhere between 90 households to more than 1000 households. These households will be in Spanish speaking disadvantaged communities of the eastern Coachella valley. It is a global project on a local level. The residents could be living on tribal land, private land or unofficially on government BLM land.

Data collected by the youth representatives will be immediately available on a centralized crowdsourcing website which is very similar to the website built by the California Department of Toxic substances and control. This website crowdsources all types of environmental health concerns (ivanonline.org) from the imperial county. The Eastern Cocachella Valley website will populate a map with wastewater failure or suspected failures. Layers will be added for other concerns developed by the students. This map will be built in real time as the project progresses. The data can be accessible by anyone after it has been validated and verified. The map data can serve as a rapid reference for anyone wishing to investigate mobile home parks, environmental health disparities, and the occurrence of wastewater system failures. Through this mapped effort, youth will be the agents of change in their communities.

4. EXPECTED RESULTS:
4a. Estimate of the Project Projection Benefits

<table>
<thead>
<tr>
<th>PERFORMANCE MEASURE</th>
<th>QUANTITATIVE OUTCOME</th>
<th>LOCAL/GLOBAL IMPACT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduce Water Treatment costs</td>
<td>After advocacy of the project and successful upgrades to on-site systems the project can save families an average of $300 / year / family or land- owners. This would be costs recovered from not paying for emergency pumping of failed on-site wastewater systems</td>
<td>Local project but global style sanitation problem</td>
</tr>
<tr>
<td>Provide technical training</td>
<td>Five different promotoras are trained in crowdsourcing, wastewater indicator testing, and training youth. The promotoras will train 40 students in these topics</td>
<td>Local students</td>
</tr>
</tbody>
</table>
Improves equitable access to sanitation services

Up to 1000 families could benefit from an improved public awareness advocacy that can start with area you using the crowdsourcing technique.

Improves the environment and sustainability by reducing wastewater contamination to the watershed

Area youth and promotoras will advocate for better practices by households who will be trained in water conservation techniques for areas with failing or sensitive on-site wastewater systems. Up to 1000 families could prevent 100 gallons/capita/day.

Local impact and global method development

*see the above outcome objectives in section 2d.

The Impact of this effort will be the creation of a dynamic mapping tool that has the ability to spatially monitor disadvantaged mobile home parks or other informal settlements disproportionately affected by social, economic and environmental factors. A direct impact will be the ability of many stakeholders to visualize spatial data allowing them to respond rapidly to communities experiencing a health disparity from environmental or infrastructure problems.

Development of this mapping tool will rely on tools available in the crowd sourcing platforms such as the open source Ushahidi or the proprietary ArcGIS™. This is necessary because the patchwork of land ownership and Indian reservation owned land has a large influence on the use of infrastructure and Environmental Justice issues in the ECV. Layers depicting the complicated patchwork of land ownership will be imported into a crowd updated dynamic map. This accomplishment will be achieved in parallel with the reporting/criteria development of infrastructure failures, the presence of mobile home parks and other environmental health topics that students feel important to advocate for through crowdsourcing. An emphasis on “resolution-based reporting” will be emphasized.

4b. Environmental significance and sustainability potential

All projects must be linked to environmental results and demonstrate how it will contribute to the ultimate goals of clean and safe water and healthy communities and ecosystems. In addition, to what degree would this project, if successfully implemented, be sustainable for long-term change? For example, sustainability factors like cost-effectiveness, ease-of-use, realistic project timeline, and the degree to which the project is locally sustainable should be considered.

4c. Describe your team’s experience and technical capabilities (including in-house and/or outside hired individuals) to accomplish the project.

This project is possible by combining the following items: (1) LLU’s specialty in GIS, (2) LLU’s experience with community based participatory action research, (3) LLU’s experience with photovoice as a health promotion strategy, (4) the presence and availability of smartphones equipped with GPS and cameras, (5) text messaging as a method to populate crowd mapped information, (6) the enthusiasm of ECV youth towards crowd mapping information, (7) the already existing establishment of a crowd sourcing platform for nearby Imperial County, (8) support from CBOs in Coachella valley, (9) support from the riverside county government in Coachella Valley, (10) the PI’s specialty area in on-site wastewater management options (10) partnership with the California EPA Department of Toxic Substances and Control crowd sourcing efforts, and (11) collaboration with the PI’s Microbial Risk Assessment of failing on site systems in the ECV.
4d. Partnerships

Please see the Appendix for letters from the following organizations that will support the project:

<table>
<thead>
<tr>
<th>Luis Olmedo</th>
<th>Sergio Caranza</th>
<th>Megan Beaman</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comite Civico Del Valle</td>
<td>Pueblo Unido CDC</td>
<td>California Rural Legal Assistance</td>
</tr>
<tr>
<td>699 E Street Brawley, CA 92227</td>
<td>78115 Calle Estado, Suite 204 La</td>
<td>Coachella Office 1460 6th Street</td>
</tr>
<tr>
<td>Tel. (760) 351-761</td>
<td>Tel. (760) 777-7550</td>
<td>Coachella, CA 92236</td>
</tr>
<tr>
<td>Fax. (760) 351-8762</td>
<td>Fax (760) 777-0271</td>
<td>Tel. (760) 398-7261</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fax (760) 398-1050</td>
</tr>
</tbody>
</table>

There are local member water agencies in Riverside County, but none of these agencies work in the areas identified for this project. This local project addresses sanitation and hygiene conditions similar to global projects in poor areas of developing countries. Because of this we are not exclusively partnering with a water agency, but are informing the riverside county through personal communication with John Watkins of Riverside County Department of Environmental Health. John Watkins and Ryan Sinclair teach an environmental health course in the winter of 2012. John Watkins has made GIS resources of the county available for an earlier arsenic water projects in the eastern Coachella Valley (see email in letters of support appendix). Upon funding, the team will make an announcement during the Environmental Justice task force of the Eastern Coachella Valley.

Future incorporation to a larger HIA

A recent UC Davis report (UC Davis, 2011) has documented the cumulative health impact of these types of issues in California’s San Joaquin valleys. Although the San Joaquin valley and the Eastern Coachella valley are similar, no cumulative health impact is yet described for the many environmental justice issues in the Eastern Coachella Valley (ECV). A report such as the UC Davis study is necessary to fully appreciate and mitigate the environmental health problems in the ECV. The Loma Linda University (LLU) Safe Water Action Team (SWAT) has recognized that a cumulative health impact study, using a participatory methodology, is necessary in the ECV. The LLU team has decidedly targeted wastewater failures as a high priority for these communities and logical start point towards a participatory method for a cumulative health impact. These households use shared septic tanks, which may have been constructed without proper percolation tests. There are also lagoons that are receiving four times the flow they were intended for. The cesspools are also alarming. Some areas such as the Hernandez mobile home park have cesspool “networks” where the shared systems frequently overflow and form puddles in the paved roads between the residences. There are informal reports that the ditch behind the trailer park is a open sewer that the landlords pump to every evening (Sinclair, 2011).
4c. List the roles and responsibilities of each team member.

<table>
<thead>
<tr>
<th>Name</th>
<th>Role</th>
<th>Responsibilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ryan G. Sinclair PhD, MPH</td>
<td>Project Faculty Lead</td>
<td>Advise students on project duties. Help organize project plan</td>
</tr>
<tr>
<td>Melisa Custer</td>
<td>Student team leader</td>
<td>Develop project plan, develop content for proposals, develop project</td>
</tr>
<tr>
<td>Travis You</td>
<td>Student Co-Lead</td>
<td>Communications, GIS, Website development, Microbiology</td>
</tr>
<tr>
<td>Diane GarciaGonzales</td>
<td>Technical GIS</td>
<td>GIS and website design</td>
</tr>
<tr>
<td>Diana Ibrahim</td>
<td>Technical Curriculum Development and Website development</td>
<td>GIS and website design</td>
</tr>
<tr>
<td>Prof. Seth Wiafe</td>
<td>Advisory in GIS</td>
<td>GIS support</td>
</tr>
<tr>
<td>Sergio Caranza</td>
<td>Advisory</td>
<td>See attached letter</td>
</tr>
<tr>
<td>Luis Olmedo</td>
<td>Advisory</td>
<td>See attached letter</td>
</tr>
<tr>
<td>Megan Beaman</td>
<td>Advisory</td>
<td>See attached letter</td>
</tr>
</tbody>
</table>

4d. Provide a project schedule with key milestone dates and deliverables with measurable outcomes.

<table>
<thead>
<tr>
<th>Milestone</th>
<th>Date</th>
<th>Deliverable</th>
<th>Measurable Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Curriculum for Promotoras ready</td>
<td>August 2012</td>
<td>Curriculum</td>
<td>Curriculum is available in Spanish and English</td>
</tr>
<tr>
<td>Curriculum for students ready</td>
<td>August 2012</td>
<td>Curriculum</td>
<td>Curriculum is available in Spanish and English</td>
</tr>
<tr>
<td>Baseline maps of land ownership and mobile home parks ready through work with CRLA and Govt. partners.</td>
<td>September 2012</td>
<td>Maps</td>
<td>Online production of maps with 2 layers detailing land ownership and mobile home parks</td>
</tr>
<tr>
<td>Venue booked for training with Puebla Unida CDC</td>
<td>September 2012</td>
<td>Training center booked</td>
<td>Training center booked</td>
</tr>
<tr>
<td>Promotoras identified with Comite Civico del Valle</td>
<td>September 2012</td>
<td>Promotoras identified</td>
<td>5 regionally representative promotoras</td>
</tr>
<tr>
<td>Students identified</td>
<td>September 2012</td>
<td>Students identified</td>
<td>40 regionally representative students, 1 per park.</td>
</tr>
<tr>
<td>Crowdsoure website ready</td>
<td>Early October 2012</td>
<td>Website is accessible remotely</td>
<td>Accessible website from remote locations. Accessible from Smartphone.</td>
</tr>
<tr>
<td>Students and Promotoras trained in GIS</td>
<td>October 2012</td>
<td>Training sessions held with 40 students</td>
<td>Knowledge improvement verified through pre-post tests</td>
</tr>
<tr>
<td>Students and promotoras trained in wastewater microbiology</td>
<td>October 2012</td>
<td>Training sessions held with 40 students</td>
<td>!!!!</td>
</tr>
<tr>
<td>Active real-time map data collection/ reporting by students</td>
<td>October 2012 – January 2013</td>
<td>A real time updated map</td>
<td>Bi-weekly progress meetings held with students/promotoras</td>
</tr>
<tr>
<td>Active reporting and advocacy to stakeholders</td>
<td>January 2013 – May 2013</td>
<td>Discussion of map at Environmental Justice meetings</td>
<td>Attend 4 environmental justice meetings</td>
</tr>
<tr>
<td>Wastewater indicator testing of failed on site systems</td>
<td>January 2013</td>
<td>Microbiological indicator testing of suspected wastewater failures.</td>
<td>Collect water quality data from 10 suspected wastewater failures</td>
</tr>
<tr>
<td>Completion of program and certificate ceremony</td>
<td>April - June 2013</td>
<td>Hold ceremony. Complete website and complete MWD final reports.</td>
<td>Hold ceremony and attend required funder meetings and submit reports</td>
</tr>
</tbody>
</table>
## F. PROJECT MANAGEMENT TEAM

<table>
<thead>
<tr>
<th>NAME</th>
<th>TITLE / ORGANIZATION</th>
<th>ADDRESS</th>
<th>PHONE &amp; EMAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Ryan G. Sinclair</td>
<td>PhD, MPH Project Faculty Lead</td>
<td>Loma Linda University School of Public Health. Department of Environmental Health and Geoinformatic Sciences, Loma Linda, CA</td>
<td>909.558.4000 x47128 <a href="mailto:rsinclair@llu.edu">rsinclair@llu.edu</a></td>
</tr>
<tr>
<td>2 Melisa Custer</td>
<td>Student team leader</td>
<td></td>
<td><a href="mailto:mcuster@llu.edu">mcuster@llu.edu</a> 760.559.7211</td>
</tr>
<tr>
<td>3 Travis You</td>
<td>Student Co-Lead</td>
<td></td>
<td>916.215.9248 <a href="mailto:travisyou87@gmail.com">travisyou87@gmail.com</a></td>
</tr>
<tr>
<td>4 Diane GarciaGonzales</td>
<td>Technical GIS</td>
<td></td>
<td>510.366.3762 <a href="mailto:dgonzales98@gmail.com">dgonzales98@gmail.com</a></td>
</tr>
<tr>
<td>5 Diana Ibrahim</td>
<td>Technical Curriculum Development and Website development</td>
<td></td>
<td>951.756.2913 <a href="mailto:dibrahim@llu.edu">dibrahim@llu.edu</a></td>
</tr>
<tr>
<td>6 Prof. Seth Wiafe</td>
<td>Advisory in GIS</td>
<td></td>
<td><a href="mailto:swiafe@llu.edu">swiafe@llu.edu</a> 909.558.4000</td>
</tr>
<tr>
<td>7 Sergio Caranza</td>
<td>Pueblo Unido CDC Advisory</td>
<td>78115 Calle Estado, Suite 204 La Quinta, CA 92253</td>
<td>Tel. (760) 777-7550 Fax (760) 777-0271</td>
</tr>
<tr>
<td>8 Luis Olmedo</td>
<td>Comite Civico Del Valle Advisory</td>
<td>699 E Street Brawley, CA 92227</td>
<td>Tel.(760)351-761 Fax.(760)351-8762</td>
</tr>
<tr>
<td>9 Megan Beaman</td>
<td>California Rural Legal Assistance Advisory</td>
<td>Coachella Office 1460 6th Street Coachella, CA 92236</td>
<td>Tel. (760) 398-7261 Fax (760) 398-1050</td>
</tr>
</tbody>
</table>
References

Flaccus, Gillian. 2011 Sewage pile, illegal dump on Thermal toxic tour list. Associated Press - June 17, 2011

Honoré, Marcel. 2011 Day of reckoning on Mecca odor as lawmakers make visit. The Desert Sun - June 18, 2011

Editorial by the Desert Sun Editorial Board. 2011 Squalor shouldn't continue in east valley. Tuesday, 05 April 2011.

Rincon, Brenda, 2011 A new group of young journalists. The Desert Sun Tuesday, 05 April 2011


## BUDGET:

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<tr>
<th>Requested Amount</th>
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<td><strong>Office Supplies &amp; Equipment</strong></td>
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<td><strong>Conference Registration</strong></td>
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<td>Results from this work will be presented at local MWD meetings, the 2012 American Public Health Association meeting and the 2013 Southwest Onsite Wastewater Conference organized by the Arizona County Directors of Environmental Services Association. No funds are requested.</td>
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<td><strong>Equipment</strong></td>
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### 18. SIGNATURE BLOCK

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<tr>
<td>Faculty Project Manager [and, if necessary, a representative of school grant development office]</td>
<td>Ryan G. Sinclair PhD, MPH</td>
<td>12/12/2011</td>
</tr>
<tr>
<td></td>
<td>Anthony J. Zuccarelli, PhD</td>
<td>12/13/2011</td>
</tr>
<tr>
<td>Student Project Manager</td>
<td>Melisa Custer MPH(c)</td>
<td>12/12/2011</td>
</tr>
<tr>
<td>Member Agency / Local Water Agency Representative</td>
<td></td>
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</tbody>
</table>

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Note:
Your school may have a grant office. Please follow all administrative and grant development office protocols.

All required signatures must be obtained, including a signature from a member agency or local water agency representative. As a non-fiscal partner, the member agency or local water agency is not required to provide financial assistance for the Project.

On a voluntary basis, the member agencies have agreed to serve as the water" sponsor and local resource specialist for the college/university. At their discretion and strictly on an as-needed basis, the member agency will provide in-kind resources and technical assistance for the college/university, pending availability of requested resources or subject matter experts (Excerpt from MWD-College Funding Agreement).

For a list of member agencies, log onto [www.mwdh2o.com](http://www.mwdh2o.com). If your college campus is outside of the MWD service area, contact the Project Coordinator, Benita Lynn Horn at [waterforum@mwdh2o.com](mailto:waterforum@mwdh2o.com) or (888) 42-WATER.
Appendix I:

California Rural Legal Assistance, Inc.
Migrant Farmworker Project

December 13, 2011

Dr. Ryan Gene Gaia Sinclair PhD, MPH
Assistant Professor
Department of Environmental Health and Geoinformatic Sciences
School of Public Health, Loma Linda University
24951 N. Circle Drive
Loma Linda, CA 92350

RE: Eastern Coachella Valley Crowd-sourcing: Empowering youth to advocate for improved wastewater management

Dear Dr. Ryan Sinclair,

Please accept this letter as an indication of my organization’s support for your proposal entitled Eastern Coachella Valley Crowd Sourcing: Empowering youth to advocate for improved wastewater management. California Rural Legal Assistance, Inc. is devoted to the pursuit of economic justice and human rights alongside California’s rural poor. Our client communities in the Eastern Coachella Valley face many challenges, among the greatest of which is a lack of very basic infrastructure including the absence of a functional wastewater management system. Families in these communities suffer repeated and sometimes regular direct exposure to wastewater inside their bathrooms and kitchens as well as outside their homes as cesspools and inadequate septic tanks overflow just outside their doors.

We plan to support your above-mentioned proposal by providing continued legal education and legal representation to the affected communities. We are also able to provide you with some baseline information—historical and current—regarding the locations of many unpermitted mobilehome parks in the Eastern Coachella Valley. Our organization and the many other advocates and other stakeholders in our communities widely appreciate the need for an improved database mapping these communities, which we hope will contribute to infrastructural and other improvements on a systematic level. We thus fully support the effort to initiate this comprehensive and centralized database and will further commit to assist you in connecting to other stakeholders, including the membership of the Eastern Coachella Valley Environmental Justice Task Force.

Sincerely,

California Rural Legal Assistance, Inc.

Megan Beaman
Attorney
December 12, 2011

Ryan Gene Gaia Sinclair PhD, MPH
Assistant Professor
Department of Environmental Health and Geoinformatic Sciences
School of Public Health, Loma Linda University
24951 N. Circle Drive
Loma Linda, California 92350

Ref: Eastern Coachella Crowd sourcing: Empowering youth to advocate for improved wastewater management

Dear Dr. Sinclair,

This letter is extended in support of your Eastern Coachella Crowd sourcing: Empowering youth to advocate for improved wastewater management application.

As you know, farm workers in the eastern Coachella Valley are the labor force of agriculture that has generated above $450,000,000 in revenues per year for the last decade, and represent the cornerstone of our local food system sustainability. Despite this vast contribution to the local economy, farm workers constitute the largest disfranchised community in Riverside County. Lack of basic infrastructure, which includes sanitary sewer collection systems and domestic potable water, is the most critical barrier to improving their quality of life. The unavailability of these critical resources leaves families with the only option of decentralized systems (onsite wells and septic systems) that create a serious environmental health issue. Many of these systems were improperly built resulting in sewer leakage with a high risk of contaminating onsite wells. Another common problem is clogging of piping resulting from disposing solids, cooking oil and other non-biodegradable substances into the system.

We are especially pleased that Loma Linda University is taking new initiatives in creating opportunities for the youth to receive adequate training and education to become aware of substandard living conditions and advocate for the improvement of critical infrastructure in eastern Coachella Valley communities.

Sincerely,

Sergio Carranza, Executive Director
December 12, 2011

Ryan G. Sinclair MPH, PhD
Loma Linda University School of Public Health
Department of Environmental Health and Geoinformatic Sciences

Re: Eastern Coachella Crowd sourcing: Empowering youth to advocate for improved wastewater management.

Dear Dr. Sinclair,

It is my pleasure to provide this letter in support of the "Eastern Coachella Crowd Sourcing", this project will empower youth to advocate for improved wastewater management. CCV is pleased to learn that if funded, Loma Linda University graduate students will collaborate with grassroots promotoras in the Riverside County Eastern Coachella Valley to engage in crowdsourcing GIS mapping activities that may serve as preliminary investigation of water management systems and use of technology for mapping dilapidated waste water systems and researching viable solutions.

Comite Civico (CCV) is a grassroots community based organization established in Imperial County since 1987. Our mission is to build healthy communities through increased access to education, access to healthcare, and civic participation. CCV has had a long history of successful partnership with Loma Linda University in projects that include the 14th Environmental Health Leadership Summit,

1 www.cjleadershipsummit.org
2 www.cjleadershipsummit.org
Visions Action Network, and Environmental Justice Initiatives related to arsenic contaminated water and unregulated toxic waste dumps. Loma Linda University and CCV are both members of the Eastern Coachella Valley Environmental Justice Enforcement Taskforce.

Loma Linda is a prestigious and ethical institution and we are grateful for your services. There is no doubt that Loma Linda University is qualified and culturally sensitive to provide research for migrant, farm working, and underserved families of Eastern Coachella Valley. CCV recognizes that Eastern Coachella Valley has historically been underserved and we fully support your endeavor to seek funding of this proposed project. Please consider Comite Civico a partner on this project, if questions please do not hesitate to contact me at jloolmedo@ccvhealth.org.

Sincerely,

Luis Olmedo
Executive Director

\[http://www.ivanonline.org/index.php?option=com_content&view=article&id=13&Itemid=20\]
Email from Yvonne Reyes of the Riverside County

From: Reyes, Yvonne <ayreyes@rivco.ca.org>
Date: Monday, May 16, 2011 9:19 AM
To: Sinclair, Ryan <rsinclair@kbu.edu>
Subject: Follow up

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I spoke with John Watkins regarding our partnership on this project and want to let you know that I am available to begin working with you as soon as you like. I’ll go through all the attachments Mark sent and make sure I’m up to speed on the issues in the Valley. I would also like to discuss our roles so I completely understand what is expected on my end. I am very much looking forward to working with you on this project and please don’t hesitate to contact me by email or phone (direct 951-955-4137).

Thank you,

Yvonne Reyes
Environmental Health Specialist IV
Riverside County Department of Environmental Health
(951) 955-8982

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From: Abbott, Mark
Sent: Wednesday, May 11, 2011 8:44 AM
To: Ryan Sinclair
Cc: Watkins, John; Reyes, Yvonne; Johnson, Jeffrey; Holt, Laurie; Jones, Jackelyn
Subject: Re: Follow up

Hello Dr. Sinclair,

I enjoyed speaking with you last week about our arsenic problems in the Coachella Valley and your mobile home mapping project. Per your request, I have attached the following documents that you requested:

- CDPH list of approved arsenic puri’s. We use these devices for our State Smalls.
- Water system requirements (our cheat sheet). I included the word version and an expanded powerpoint presentation.
- An Excel spreadsheet that lists water systems that exceed the arsenic MCL in Riverside County.

I have also included additional documents that might be useful for your project. These files include: a powerpoint presentation from the Arsenic Community Meeting in Mecca last year, an informational bulletin on arsenic in the Coachella Valley, and a Tier 2 notice.

Please let me know if you have any questions regarding these items or if you need additional information.

I’m looking forward to working on this project with you,

Mark Abbott EHS IV
Riverside County Department of Environmental Health
PH: (760) 393-3390
FX: (760) 863-7013
markb@rivco.ca.org