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**Chemists Without Borders Annual Report 2013**
Letter from the President

Dear Friends,

In taking on the role of President of Chemists Without Borders, I plan to emphasize the role of chemistry in our humanitarian efforts and design projects with significant social impact to better utilize the chemistry expertise of our 660 members in 53 countries.

2013 was a year of adjustments. We collaborated with new partners, reshaped project goals, and reorganized our staff. We were saddened by the loss of Dr. Lois Ongley our Secretary, Sierra Leone project initiator, and executive team member. Lois was a Distinguished Member of Chemists Without Borders and played a key role in the formation and operations of Chemists Without Borders. She will be missed.

Chemists Without Borders utilizes proven chemical technologies to help solve humanitarian problems. Water is a major concern throughout the world. We focus our actions on chemicals in water. Each year 170 million people suffer from arsenic poisoning.¹ We have validated the SONO filter as a remediation technology. Our Arsenic activities are focusing on awareness efforts. Targeting the next generation, we are building an educational program for high school students in developing countries.

We brought on a new Executive Director, Ladan Aslani Artusy, who is enhancing the internal operations and partnership alliances of Chemists Without Borders. Ladan’s financial and executive level expertise is adding proven business fundamentals to our scientific organization. Bego Gerber is now concentrating on developing our Board of Directors in his role as Chairman of The Board. Lou Ciabattoni accepted our Vice President role, after spending the past two years in memberships. His industry and business knowledge will help Chemists Without Borders grow efficiently. David Lini has stepped in to fill the void left by the loss of Dr. Ongley for financial oversight, Evan Sarina has taken on the role of Secretary, and Mengling Jia has succeeded Lou Ciabattoni as Membership Manager. These capable individuals will be instrumental in the success of Chemists Without Borders. I look forward to a productive year in 2014.

BY STEVEN D. CHAMBREAU, PRESIDENT

¹http://www.geog.cam.ac.uk/research/projects/arsenic/symposium/S1.2_P_Ravenscroft.pdf
Our Work in 2013

Arsenic Public Education Project
The original idea for Chemists Without Borders’ Arsenic Project has undergone some evolution from the original concept. Our original proposal was to provide 500 SONO filters to households in Bangladesh and to license the SONO filter for use in other countries. However, through discussions with knowledgeable experts in arsenic remediation and expertise in the situation in Bangladesh, Chemists Without Borders has instead determined that education of students in Bangladesh would be a more effective way to discourage drinking of arsenic-laden water in Bangladesh.

Chemists Without Borders’ Arsenic Public Education Project in Bangladesh will identify local high schools in arsenic-affected areas in Bangladesh and deliver arsenic removal systems and arsenic test kits to them directly. This opportunity will lead to greater awareness in the younger community in Bangladesh of the problems of arsenic and how to address them. By educating the students, we aim to educate the population at large in Bangladesh about the dangers of arsenic and about the available solutions.

Objectives of this project:

1) To develop, translate and distribute a protocol for testing and treatment of arsenic in drinking water which can be easily applied and disseminated to high schools in Bangladesh.
2) To enlist high school students to test drinking water sources and monitor the efficacies of arsenic removal technologies as per the protocols developed (see Objective 1).
3) To provide SONO filters and arsenic test kits to 10 high schools in Bangladesh.
4) To verify arsenic levels in high school water supplies after successful delivery of SONO filter, test kits and demonstration protocol.
5) To reduce drinking water arsenic levels in participating high schools to less than 50 ppb (Bangladesh standard) and preferably less than 10 ppb (WHO standard), and enable 500+ school children to routinely access safe, drinkable water in 2 years.
6) To evaluate the success of the project within 1 year of SONO filter delivery and develop a program plan.

We are collaborating with UNICEF to develop and implement an arsenic education project which involves providing high schools in Bangladesh with a SONO filter, arsenic test kit, and instructions, translated into Bengali, on how to use the filter and the kit. The testing protocol will be developed, validated and then translated by Chemists Without Borders volunteers in the United States. UNICEF will help to identify high schools in highly arsenic-affected areas in Bangladesh such as in Kushtia and Sitakunda. Manob Sakti Unnayan Kendro (MSUK, SONO filter manufacturer in Bangladesh) has agreed to donate several SONO filters used in this proposal. We would also like to develop studies which could include (but not be limited to) the following: efficacy, shelf-lives of EconoQuick and other test kits, mapping out arsenic concentrations in local water supplies, effectiveness of education in reducing arsenic poisoning, etc. If this project is successful in educating the local population about how to deal with arsenic poisoning, UNICEF would assist in scaling this into a regional and even possibly a national program.

In 2013, Hach donated 10 arsenic test kits for evaluation and development of the high school demonstration: five of

Students at University of Connecticut, Waterbury perform evaluation of the Hach arsenic test kits.

Professor Nina Stein discusses using the Hach arsenic test kits.
the EZ arsenic test kits and five of the low range arsenic kits. Hach has also agreed to donate twenty five more kits (to be determined in the evaluation process) and ship them directly to the schools in Bangladesh.

UNICEF has generously donated 100 EconoQuick arsenic tests. These test kits are very similar to the Hach test kits used in Phase I of the project. The kits are currently stored at Bangladesh University until we can scale up the project in Phase II.

We would like to thank the following participants in this project for their efforts: Dr. Satinder (Sut) Ahuja (American Chemical Society), Ms. Sahima Khan, Professor Julian Tyson (University of Massachusetts, Amherst), Dr. A. K. M. Munir (Manob Sakti Unnayan Kendro), Professor Abul Hussam (George Mason University), Mr. Peter Ravenscroft (UNICEF), Mr. Shoshel Nipu and Mr. Jamil Azher (Bangladesh University), and the US evaluation teams (Professor Rusty Myers (Alaska Pacific University), Professor Amber Wise (Chicago State University), Dr. Mike Paquette and coworkers, Professor Nina Stein (University of Connecticut, Waterbury), and Professor Ray Kronquist (Foothill College).

IdeaConnection

Chemists Without Borders partnered with IdeaConnection to solve five humanitarian Challenges including water testing and treatment. IdeaConnection, an industry leader in open innovation and solving R&D challenges, has made a generous $500,000 in-kind donation to Chemists Without Borders. They have partnered with us to devise solutions to ten challenges affecting the health of millions. The challenge teams are thus far working on the following five challenges:

- The Arsenic Penny-per-Test Challenge is seeking a simple test to be designed that would detect arsenic levels in groundwater that will cost only one penny ($0.01 US) per test. More than 75 million people in Bangladesh are at risk for arsenic poisoning, and current tests are too expensive to be practical. The test should be able to be manufactured and distributed locally, and must be accurate and reliable.
- The Arsenic Removal Water Filter Challenge is seeking a water filter design that would remove arsenic from water to less than 50 ppb (Bangladesh standard) and, ideally, to less than 10 ppb (WHO standard), and must be able to be manufactured as a cottage industry in developing countries like Bangladesh.
- The Contaminated Water Testing "Tool Kit" Challenge is seeking an analytical tool kit that would identify major impurities in water. Impure drinking water is a major source of illness throughout the world, and a cost effective, portable and straightforward testing kit could protect millions of people from succumbing to debilitating diseases.
- The Contaminated Water Treatment "Tool Kit" Challenge is to design a portable, easy-to-use tool kit for treating contaminated water for some of the major impurities that affect human and environmental health globally.
- The Electronic Waste Challenge is reaching out to the global community to design an action plan to alleviate the health and safety risks to uneducated and underprivileged workers in India, China and Africa who extract metals from e-waste. Workers are exposed to dangerous levels of toxins such as lead, cadmium, mercury, chromium and polyvinyl chlorides.

A call for volunteers was published in the American Chemical Society’s weekly newsletter ACS Matters. The IdeaConnection teams will have the solutions ready for review in March 2014.

Sierra Leone project

The Sierra Leone Education Project leadership role has been picked up by Professor Rusty Myers after the previous project leader Professor Lois Ongley’s unfortunate death. In Lois’s honor, this project has been renamed the “Lois K. Ongley Chemistry Kits for Sierra Leone Project.” Professor Myers has requested a sabbatical in 2014 to get this project back up and running. The goal of this project is to develop and implement small green chemistry instruction kits for use in secondary schools in Sierra Leone.
Membership
Chemists Without Borders added 80 members in 2013 and now has 660 members in 53 countries. Members participate in bi-weekly Conference Calls, project teams, and contribute to our newsletters and blog. Chemists Without Borders is also reaching out to our membership through Social Media – ACS Network, our Facebook Group page and Community Page, as well as our LinkedIn Group page.

Financials
Chemists Without Borders currently operates on a modest budget and the entire staff and members are volunteers. It has benefited from the very generous contributions of its key members and donors. In 2013 fundraising was mainly to support our Arsenic and Sierra Leone Chemistry Education projects. (2013 goal = $50K).

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Donations
Thank you to our 2013 donors: Hach Company: 10 arsenic test kits, K.C. Wang, a Distinguished Member, led a mid-year Arsenic Education Project fundraising campaign raising over $1,600, and to our members and staff who volunteer their time and energy.

Thank You 2013 Volunteers!
Hours donated: 3,511
Total Staff Volunteers: 16
Total value of volunteer hours: $160,460

Corporate Donations
We thank IdeaConnection for their in-kind $500,000 donation. Chemists Without Borders has also received a generous donation from Hach Company of 5 low-range and 5 high-range arsenic test kits (value = $1,100), and twenty-five additional kits will be donated and sent directly to Bangladesh when we scale up the arsenic project. For phase II of the arsenic project, UNICEF has also made available 100 EconoQuick arsenic test kits in Dhaka, Bangladesh, for future use (value = $19,000).