

## **Sustainable Remediation Forum (SURF)**

### **SURF 13: April 13 and 14, 2010**

### **Chicago, Illinois**

SURF 13 was held in Chicago, Illinois, on April 13 and 14, 2010, at the Chicago-Kent College of Law of the Illinois Institute of Technology. SURF members that participated in the two-day meeting are listed in Attachment 1 along with their contact information. The meeting marked the 13<sup>th</sup> time that various stakeholders in remediation—industry, government agencies, environmental groups, consultants, and academia—came together to develop the ability to use sustainability concepts in remedial decision-making. Previous meeting minutes are available at [www.sustainableremediation.org](http://www.sustainableremediation.org).

### **Meeting Opening**

The meeting began with Mike Rominger (meeting facilitator) welcoming members and thanking the staff of Chicago-Kent College of Law for hosting the meeting and SURF member Steven Murawski (Baker & McKenzie) for helping coordinate logistics with the host.

Then Mike presented the mission statement of SURF as follows: “The mission of SURF is to maximize the overall environmental, societal, and economic benefits from the site cleanup process by advancing the science and application of sustainable remediation, developing best practices, exchanging professional knowledge, educating, and reaching out.”

Mike discussed meeting logistics and ground rules and stated that it was assumed that nothing discussed or presented contained confidential information. Mike explained that export control laws that pertain to the transfer of technology to non-U.S. citizens and their countries do not appear to apply, but advised participants to act appropriately for their organizations. Mike read the following antitrust statement:

“It is not the purpose of this meeting to discuss an existing or planned situation involving any party, whether a participant here today or not, concerning the price, customer base, volume, market, quality, design or cost structure of any commercial product or service, or to plan any course of action having an exclusionary or discriminatory effect.”

Efforts to achieve “sustainable neutral environmental behavior” continued at this meeting. Name tags were reused. Many participants brought their own coffee mugs and water bottles and used public transportation to travel to the meeting location. Some participants reduced the carbon footprint caused by their travel by purchasing carbon offsets. Efforts to achieve sustainable neutral behavior are ongoing and will continue at future meetings.

Mike thanked the Meeting Design Team for their work in planning the meeting agenda. SURF 13 Meeting Design Team members were as follows: Kurt Beil (ARCADIS), Brandt Butler (URS), Dave Ellis (DuPont), Stephanie Fiorenza (BP), Ben Foster (ARCADIS), Tim Havranek (ENTRIX), Karin Holland (Haley & Aldrich), Mike Miller (CDM), Steven Murawski (Baker & McKenzie), Karina Tipton (Brown and Caldwell), Dan Watts (New Jersey Institute of Technology), Tod Whitwer (Allwyn Environmental), and Dave Woodward (AECOM Environment).

## Host Welcome

Dean Harold J. Krent (Chicago-Kent College of Law) welcomed SURF members to the Illinois Institute of Technology (IIT) and Chicago-Kent. He told the group that small cross-disciplinary teams have been the key to the advancement of their university and also the key to success for SURF. Dean Krent provided examples of their collaboration efforts in the fields of business, law, and engineering science and design. At the Wanger Institute for Sustainable Energy Research (WISER), more than 50 faculty members are currently involved in energy and sustainability research and educational activities across the colleges and institutes at IIT.

## Board of Trustees Activity Update

At the last SURF meeting, the first SURF Board of Trustees was announced. On behalf of SURF, K&L Gates has submitted the Certificate of Incorporation and applied for 501(c)(3) status (i.e., nonprofit organization). This process is expected to take a few months. In addition, the SURF acronym was submitted as the Registered Name of the Corporation. The Board continues to meet once every two weeks via conference calls to address organizational issues. Dave Ellis (SURF President) provided the following summary of the Board's activities since the last meeting:

- ❑ The Board established the committees listed below. The Board agreed that membership is a requirement for committee and initiative participation. Exceptions to the policy can be suggested by chairpersons and the Board assuming Board approval. Dave explained that a SURF member would serve as chairpersons of these committees, with a Board member serving as co-chairpersons. Board member co-chairpersons have been selected; committee chairpersons will be selected by the Board from among the membership.
  - Membership (Co-Chairperson: Dan Watts)
  - Communications and Outreach Committee (Co- Chairpersons: Maile Smith and Stephanie Fiorenza)
    - Academic Outreach Initiative
    - Government Employees Outreach Initiative
    - Discipline Diversity Initiative (new; see pages 8 and 9 of these notes)
  - Finance (Co-Chairperson: Brandt Butler)
  - Meetings and Programs (Co-Chairperson: Dave Ellis)
  - Nominations (Co-Chairperson: Dick Raymond)
  - Technical Initiatives (Co-Chairperson: Paul Favara)
    - Framework and Metrics Initiative
    - Life-Cycle Assessment (LCA) Process Initiative
- ❑ The Board approved proposals from Mike Rominger (meeting facilitator) and Kathy Adams (technical writer) to support SURF. Contracts with each consultant are being drafted.

- ❑ The Board set up and approved a SURF Sponsorship Program that specifies Gold (\$5,000 or more), Silver (\$2,500), and Bronze (\$1,500) sponsorship opportunities. Members interested in sponsorship opportunities should contact Brandt Butler, SURF Treasurer.
- ❑ Based on prior SURF meetings, the Board determined the following membership categories and annual dues:
  - Regular Members – \$150
  - Government Members – \$100
  - Student Members – \$25
- ❑ The Board approved the expense of SURF lapel pins for all members and new members that sign up at Battelle. Pins will also be used for future outreach efforts.
- ❑ On behalf of SURF, Grant Geckeler (Good Earthkeeping Organization) applied for a trademark on the SURF logo and name.

Detailed minutes from the Board of Trustees conference calls are available to members at [www.sustainableremediation.org](http://www.sustainableremediation.org) in the members-only section under “Administrative Documents.”

## **Committee Activity Update**

Activity updates were presented for the Membership and Finance Committees only. Other committee activities were discussed in detail during the breakout sessions (see page 7 of these notes for more information).

- ❑ **Membership Committee**  
On behalf of Dan Watts (Co-Chairperson of the Membership Committee), Maile Smith (SURF Secretary) reported that SURF has about 75 members. At the time of the meeting, corporate sponsorship had been received by AECOM (Gold Sponsor), DuPont (Gold Sponsor), Langan Engineering (Bronze Sponsor), and Terra Systems (Silver).
- ❑ **Finance Committee**  
Brandt Butler (SURF Treasurer) provided an update of the Finance Committee. Brandt told participants that SURF has established a bank account with Bank of America due to the bank’s numerous locations nationally. He said that SURF had received approximately \$13,000 from SURF 13 meeting registration fees and membership fees. Approximately \$19,000 in sponsorships has been received, with more than four additional sponsors whose payments are expected soon. Anticipated expenses include meeting support (estimated at \$10,000), possible purchase of general liability insurance and a Directors and Officers policy to cover Board members (estimated at \$2,000), and the purchase of lapel pins (\$730). When anticipated sponsorships are considered and expenses are deducted, the remaining cash assets are just under \$20,000.

## News Items

Participants discussed the news items below. These news items are highlighted on SURF's web site ([www.sustainableremediation.org](http://www.sustainableremediation.org)). E-mail addresses and phone numbers for news item contacts are provided in Attachment 1.

- ❑ Mike Miller (CDM) has been asked to chair a session on Sustainable Remediation and Life Cycle Assessment at the “26<sup>th</sup> Annual International Conference on Soils, Sediments, Water and Energy.” The conference will be held at the University of Massachusetts, Amherst, Massachusetts, on October 18 through 21, 2010. Although the official abstract deadline has passed, Mike has been authorized to continue to accept abstracts. Please consider being a part of this session. You can learn about the conference at <http://umasssoils.com/>, and see the call for abstracts at <http://umasssoils.com/papers.htm>. Contact Mike directly with questions.
- ❑ Dave Ellis (DuPont) provided the following news items:
  - Colorado State University and IIT have both expressed interest in establishing student chapters of SURF.
  - Battelle's next “International In Situ and On-Site Bioremediation Symposium” is changing its name. The revised name, “Symposium on Bioremediation and Sustainable Environmental Technologies,” is aimed at reflecting the maturation of an industry that considers the most sustainable overall approach to site cleanup. The symposium will be held in Reno, Nevada from June 27 through 30, 2011, and conference coordinators look forward to SURF's active participation.
- ❑ Steven Murawski (Baker & McKenzie) told participants that he is looking for volunteers to help him create a database containing sites where sustainable remediation was a component of the solution. Steven plans on beginning with the green remediation sites that the Environmental Protection Agency (EPA) lists on-line. Site information would be presented and SURF members would provide brief legal and technical comments for each site. The idea is to present the site in such a way that it addresses EPA's core elements but also considers elements associated with social and economic issues. Steven suggested that interested volunteers could form and group and work with the Academic Outreach Initiative to obtain the help of students for some of the initial legwork. Interested members should contact Steven directly.
- ❑ John Simon (WSP Environment and Energy) provided the following news items:
  - The “Northeast Sustainable Communities Workshop” will be held June 17, 2010 in Newark, New Jersey. Members interested in attending should contact John directly.
  - John told participants to contact him if they are interested in contributing to the Sustainable Remediation Panel in *Remediation*. The journal is published quarterly, and each issue contains a question relating to some aspect of sustainable remediation. Panel members respond on a voluntary basis to the question, and answers are published in the journal.

- Jonathan Smith (Shell Global Solutions and SuRF-UK member) told participants that the next Network for Industrially Contaminated Land in Europe (NICOLE) meeting would be held next week and that he would provide SURF members with an update after the meeting. The NICOLE meeting was cancelled because of flight restrictions due to volcanic ash.

## Academic Outreach Panel Discussion

Mike Miller (CDM) introduced the Academic Outreach Panel Discussion, which was designed not only to allow academia to share their perspective about sustainable remediation but also exchange ideas about how SURF can help academia in their efforts and vice versa. Panel members were Dan Cassidy (Western Michigan University), Paul Anderson (IIT), and Kevin Finneran (University of Illinois, Urbana-Champaign). Unfortunately, Kevin was unable to participate in the panel because of his sustainable travel methods—he took the train to the meeting and was delayed.

Dan began the panel discussion and described his background as focusing on bioremediation, chemical oxidation, and redox manipulation. Dan told members that he is looking forward to learning more about sustainable remediation and that, in its simplest form, he thinks of sustainability as an attempt to be as frugal as possible. He thought that SURF could serve as a valuable conduit for research proposals and mentioned the LCA process as a possible first topic. Dan was enthusiastic about incorporating sustainable concepts into his research, getting his students involved, and having a synergistic relationship with SURF regarding new research ideas.

Paul Anderson is a professor in IIT's Department of Civil, Architectural, and Environmental Engineering with a focus in physical and chemical treatment processes. Paul also works with IIT's WISER program, supporting its efforts to improve the quality of life while preserving and enhancing natural resources and the environment. WISER promotes developing state-of-the-art interdisciplinary education and research programs and commercializing technologies in partnership with industry, national and research laboratories, and other universities. Paul is chairing an IIT committee that is looking at how to integrate sustainability concepts across curricula and would

welcome SURF help with the process. The committee hopes to create modules to help faculty integrate sustainable concepts into teaching on a voluntary basis. They have developed a Sustainable Systems Science course designed to introduce students to the fundamentals of sustainability. Paul mentioned that SURF could contribute to these efforts of integrating sustainability by offering student internships and establishing collaborative research programs. He also challenged SURF members to identify the skills needed if they were designing a "perfect future employee." This skills listing could help define objectives for new curricula.

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### Ideas

- ✓ Establish collaborative research projects between SURF and academic community (e.g., convert social considerations into metrics).
  - ✓ Serve as conduit for research proposals.
  - ✓ Determine role and function of student chapters.
  - ✓ Offer scholarships and/or internships to students.
  - ✓ Serve as guest speakers with real-world experience at universities.
  - ✓ Identify the skills needed for the Perfect Future Employee.
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After the panelists provided their sustainability perspectives, members asked the panelists questions and ideas were exchanged. Discussions focused on the need to integrate sustainability concepts into students' thinking. Participants seemed to agree that Dan's idea of relating frugality to sustainability could be a good place to start. Engineering students are often taught to evaluate one problem vs. the big picture. Participants seemed to agree that it will be necessary to encourage students to look at the big picture (e.g., the footprint of a technology) while keeping students engaged in the technical aspects of engineering. Dan told members that he is integrating sustainability concepts into his teaching, but that the success of this effort will depend on the involvement of other disciplines besides those associated with environmental work. One SURF member suggested converting triple bottom line considerations into lines of evidence as a way to appeal to "techies." In this way, environmental, social, and economic aspects would be considered.

Additional discussions focused on the importance of student chapters of SURF and the issues to consider when forming the chapters.

- ❑ Importance of Student Chapters

All participants seemed to agree that student involvement in SURF is important to the long-term viability of the organization. Participants also agreed that the fields of study of SURF student chapter members should reflect all aspects of the triple bottom line (e.g., environmental engineers, sociologists, economists).

- ❑ Considerations of Formation

One SURF member suggested examining the IIT chapter of Engineers Without Borders to gather ideas on how to address issues such as student chapter formation and guidelines. All participants seemed to agree that the Academic Outreach Initiative should help determine the function and role of a student chapter as a means to clarify these issues.

Although the details of student chapter formation are not known at this point, all participants seemed to agree that there is an upwelling of interest in sustainable initiatives. Paul said that, despite a lack of knowledge about the definition of sustainable remediation, students are enthusiastic. Participants seemed to agree that sustainability as a general concept is the key that opens the door for discussion about sustainable remediation. Participants also agreed that SURF should capitalize on this enthusiasm and use it to educate people about the specifics of sustainable remediation, demonstrating that it is more than just a buzz word. One SURF member stressed the importance of deriving value when communicating about sustainable remediation. When deriving value, "cost" is assessed by aspects of societal gain. He said that showing these gains is the key to obtaining stakeholder buy-in.

## **Technical Presentation**

Because SURF 13 was designed to be a working meeting, the amount of technical presentations was limited to one. The presentation and subsequent discussion are summarized in the paragraphs below.

Jonathan Smith (Shell Global Solutions) presented the framework developed by SuRF-UK for evaluating sustainable remediation options. The document, "A Framework for Assessing the Sustainability of Soil and Groundwater Remediation," is the first to provide an authoritative

framework for assessing the sustainability of soil and groundwater remediation in the UK. Jonathan provided a brief background about SuRF-UK; outlined the objectives, context, and content of the framework; and detailed the future efforts of the organization around this issue.

The framework consists of two stages, plan/project design and remediation implementation, and is aligned to existing documents of the UK best practices for managing land contamination (i.e., CLR 11). The framework has a tiered structure, with possible sustainable remediation indicator categories that represent all three aspects of the triple bottom line of sustainability. These possible indicator categories are not *all* applicable at a particular site and, in some cases, more than one metric is possible for each indicator. Jonathan said that integrating sustainable concepts into the remediation implementation stage results in a small positive impact. He told participants that the goal is to influence the project in a sustainable fashion during the plan/project design stage for maximum positive effect. However, Jonathan expects that the most common use of the framework will occur during the remediation implementation stage or, more specifically, during the remedial alternative selection stage. Over the next year, SuRF-UK plans to develop and refine indicators, test the framework with real case studies, and benchmark low- and high-tier assessment tools.

Throughout his presentation, Jonathan stressed that recent legislation (i.e., Draft EU Soil Protection Framework Directive and EU Water Framework Directive) addresses all three aspects of the triple bottom line of sustainability. SuRF-UK shares this approach through its framework. Alignment between SuRF-UK and regulators is most clearly visible in the diverse list of signatures (e.g., agency representatives, policy managers and advisors) contained in the foreword of the report. The full report is available via link at <http://www.sustainableremediation.org/links/>. Presentation slides are provided in Attachment 2.

Discussions focused on the collaborative relationship between all parties involved in remediating sites. The document was written by regulators, industry members, consultants, and members of CL:AIRE (Contaminated Land: Applications in Real Environments). Jonathan told participants that constructive relationships built on prior working experiences contributed to the success of the project.

Other discussions focused on the three aspects of the triple bottom line and the categorization of indicators. One participant said that, at times, some stakeholders are interested in green remediation vs. sustainable remediation. Jonathan said that a more holistic approach can be encouraged by focusing on maximizing the overall benefit and demonstrating the missed opportunities that result when all three criteria are not considered. Another participant pointed out that human health was included in the social indicator category in the framework document. Jonathan stated that SuRF-UK and regulators broadly agree that impacts on human health and safety be included as a social indicator.

## **Breakout Sessions**

At the meeting, the following groups met: Communications and Outreach Committee, Academic Outreach and Government Employees Outreach Initiatives, and the Technical Initiatives Committee. Mike Rominger (meeting facilitator) challenged the groups to think about the following questions:

1. If sustainable remediation is the solution, what is the problem?

2. What will your committee do between now and SURF 14?
3. What would your committee like to see, do, experience, and/or learn at SURF 14?

As part of Question #2, Dave Ellis (SURF President) challenged the groups to develop a plan for deliverables and milestone deadlines.

A summary of the key action items of the groups is provided below. More detailed summaries of the breakout sessions for each group are provided in Attachment 3. SURF members interested in joining a particular effort should contact the co-chairperson listed on page 2 of these notes.

### ***Communications and Outreach Committee***

The Communications and Outreach Committee used the face-to-face time in the breakout session to work on the many efforts initiated by the group. Preparing for and coordinating SURF's presence at the Battelle conference and completing the general SURF presentation were the most urgent topics discussed. For both of these efforts, the group identified leaders and deadlines to ensure progress (see Attachment 3 for a detailed list of action items). In addition, the group developed a draft mission statement for their committee, and agreed that the SURF web site would serve as the primary tool for communicating SURF's activities and progress on various initiatives. Attachment 3 provides a detailed summary of the topics discussed during the Communications and Outreach Committee breakout session.

The Academic Outreach and Government Employees Outreach Initiatives fall under the purview of the Communications and Outreach Committee. Brief summaries of the breakout discussions of these groups are provided below. Detailed notes are provided in Attachment 3.

#### **❑ Academic Outreach Initiative**

This group focused on three main action items: organizing and funding a student paper competition at Battelle 2011, developing guidelines for student chapters, and developing a general presentation tailored to an academic audience. Additional topics discussed are provided in Attachment 3. Similar to the Communications and Outreach Committee, the Academic Outreach Initiative group discussed the importance of developing a mission statement specific to their efforts. All acknowledged, however, that clarification on some issues is needed from the Board of Trustees. These issues are listed in Attachment 3.

#### **❑ Government Employees Outreach Initiative**

The group focused on the following action items: revising the existing conflict of interest statement, developing a unified message for SURF, and reaching out to government employees through various efforts. For the latter, the group discussed developing modules for government employees, identifying government agencies for outreach activities, and maximizing SURF's exposure to government employees through presentations [e.g., Association of State and Territorial Solid Waste Management Officials (ASTSWMO)]. Specific action items are provided in Attachment 3.

After the Academic Outreach and Government Employees Outreach Initiatives met separately, they met together with each other and the Communications and Outreach Committee to identify common themes and avoid duplication of effort. When the three groups converged, all seemed to emphasize the importance of reaching out to all disciplines associated with the three aspects of



the triple bottom line. Current outreach efforts focus on academia and government employees, but the group believed that involving diverse fields beyond environmental sciences and engineering (e.g., agricultural economics, sociology) was equally important. Therefore, the groups decided to add an additional effort – the Discipline Diversity Initiative – under the Communications and Outreach Committee. SURF members interested in leading this initiative should contact Stephanie Fiorenza, Maile Smith, or Jake Torrens.

This larger group also discussed possible topics for SURF 14. All seemed to agree that a brief recap (highlights only) of Battelle would be timely at the next meeting in July. Realizing that SURF 13 was a working meeting, the group thought that it would be important to have more technical presentations on the agenda at SURF 14. The Academic Outreach Initiative suggested a time slot at the next meeting for a test run of their general presentation geared for an academic audience. Finally, all seemed to agree that a two-hour time slot at the next meeting about development of a general SURF training package would be appropriate. The training would be aimed at educating people about sustainable remediation and its applications. One hour during the next meeting could be geared toward obtaining member input about the training package, with the remaining hour allotted for a breakout session to tackle issues and generate ideas in smaller groups.

The Communications and Outreach Committee decided to meet via conference call once a month to resolve outstanding issues and continue the group's momentum.

### ***Technical Initiatives Committee***

The technical initiatives addressing Framework, Metrics, and the LCA Process are included under the Technical Initiatives Committee. Members of these groups met together to take advantage of the synergy of face-to-face interactions. The group began by listing the problems they were trying to address with the various initiatives. Common themes of inconsistent approaches, lack of parameters for decision making, and a lack of agreed upon definitions were evident. After some discussion, the group agreed upon the meanings of the terms (see below). The groups developed plans for deliverables, and annotated outlines of deliverables for all three efforts will be completed by SURF 14.

#### ☐ Framework

The group decided that the framework should be thought of as the overall vision to maximize the net benefit of social, environmental, and economic considerations when implementing remediation. A framework is needed because there is an inconsistent approach to maximizing these net benefit considerations. Those members involved in this initiative will be developing a critical evaluation and analysis of the existing framework. The resulting deliverable may include a flow diagram that covers the entire remediation timeline with general questions to be asked at each milestone in the project. The deliverable will also include SURF's vision for a holistic tool to implement sustainable remediation.

#### ☐ Parameters and Metrics

The group created a distinction between sustainable parameters and sustainable metrics. Parameters are the considerations – impacts – stressors of environmental, social, and economic importance (e.g., global warming potential or groundwater resources). Metrics are the measured burdens associated with a remedial action (e.g.,

carbon dioxide emissions or groundwater use). Those members involved in this initiative will critically evaluate the available parameters and metrics appropriate to the remediation process. The group will also identify the metrics that are missing from current practice.

❑ **LCA Process**

The group decided that this initiative was a process for individuals to follow, not a tool to use. As a result and as reflected in these notes, the group tentatively decided to change its name to the LCA Process Initiative (vs. LCA Initiative). However, the term “methodology” may substitute “process” at a later date. The LCA process will help individuals make more sustainable decisions for a specific remediation project and will help them decide the most appropriate metrics and impact assessment methods to use when performing a sustainability assessment. In addition, the LCA process will help individuals set appropriate boundaries for the aspects that should be considered as part of the sustainable assessment. Finally, all agreed that use of the LCA process will bring the clarity and transparency to sustainable assessments that has been lacking to date.

The group discussed possible topics for SURF 14. All seemed to agree that a portion of SURF 14 should be dedicated to the social considerations associated with sustainable remediation. The group also felt it was important to allot time at SURF 14 to gather input from the larger group on the current status and direction of the technical initiatives. The need for time in breakout sessions to allow collaboration among members was seen as important. Finally, the group stressed the importance of individuals from the Colorado Department of Public Health and Environment and EPA Region 8 attending the meeting.

The Framework, Metrics, and LCA Process Initiatives are three independent groups that meet approximately monthly via conference call. Leads for each of these three technical initiatives try to attend other technical initiative calls to assure coordination of deliverables.

## **Action Items**

The following action items were identified during the meeting:

1. Colorado State University will host the next meeting (SURF 14), which will be held July 13 and 14, 2010. The address is as follows: The Lory Student Center, Colorado State University, Fort Collins, Colorado, 80523-1062. Please note that registration for SURF 14 requires that you join SURF if you have not already done so. SURF membership applications and SURF 14 registration are available on-line via the SURF web site, [www.sustainableremediation.org](http://www.sustainableremediation.org).
2. The work of the committees and initiatives will continue. All scheduled conference calls for the various committees and initiatives are shown on a calendar on the web site. The calendar is located on the members-only portion of the SURF web site under “Member Resources, Committee Calendar.” SURF members interested in joining a particular effort should contact the co-chairperson directly (see page 2 of these notes).
3. SURF 15 will be held October 5 and 6, 2010 at Carnegie Mellon University in Pittsburgh, Pennsylvania. SURF members who would like to participate in the Meetings and Programs Committee should contact Dave Ellis.

**Attachment 1**  
**SURF 13 Participant Contact Information**

## SURF 13 Participant Contact Information

Participant	Affiliation
Abrams, Stewart	Langan Engineering & Environmental Services
Adams, Kathy	Writing Unlimited
Anderson, Paul	Illinois Institute of Technology
Armstead, Robert	WRS Compass
Baker, Carol	Chevron Energy Technology Company
Bhargava, Mohit	Battelle Environmental Restoration
Broderick, Bill	Mayfield   Broderick
Butler, Brandt	URS Corporation
Cassidy, Daniel	Western Michigan University
Denson, Scott	Sunpro Services
Desrosiers, Rebecca	Anchor QEA
Dugan, Pamela	Carus Corporation
Ellis, Dave	DuPont
Espino Devine, Catalina	Chevron
Favara, Paul	CH2M Hill
Finneran, Kevin	University of Illinois
Fiorenza, Stephanie	BP
Foster, Ben	ARCADIS
Garson, Nick	Boeing Company
Gillespie, Rick	Regenesys
Hadley, Paul	California Dept. of Toxic Substances Control
Holland, Karin	Haley & Aldrich
Martin, Todd	Integral Consulting, Inc.
Miller, Mike	CDM
Morgan, James	National Grid
Murawski, Steven	Baker & McKenzie
Petrovskis, Erik	Geosyntec Consultants
Raymond, Dick	Terra Systems
Rominger, Mike	On-Board Consulting
Semer, Robin	URS Corporation
Simon, John	WSP Environment and Energy
Sohl, John	COLUMBIA Technologies
Solomon, Brian	Anchor QEA
Srivastava, Vipul	Parsons Corporation
Taege, Deborah	Boeing Company
Thomson, Michelle	DuPont
Tipton, Karina	Brown and Caldwell
Watts, Dan	New Jersey Institute of Technology
Wice, Rick	Shaw Environmental & Infrastructure Group
Woodward, Dave	AECOM Environment
<b>Remote Attendees</b>	
Dona, Carol	U.S. Army Corps of Engineers Environmental and Munitions Center of Expertise
Fisher, Angela	GE Global Research
Lantz, Bill	Delta Consultants

### **SURF 13 Participant Contact Information**

<b>Participant</b>	<b>Affiliation</b>
Larsen-Hallock, Lorraine	California Dept. of Toxic Substances & Control
McNally, Amanda	AECOM
Smith, Jonathan	Shell Global Solutions
Smith, Maile	Northgate Environmental Management
Sowinski, Mike	Terradex
Torrens, Jake	AMEC Geomatrix

**Attachment 2**  
**SuRF-UK Framework for Evaluating**  
**Sustainable Remediation Options**

# **SuRF-UK framework for evaluating sustainable remediation options**

Professor Jonathan Smith

SURF 13, Chicago  
14 April 2010



## **Content**

- SuRF-UK
- Objectives for a SuRF-UK framework
- EU and UK legislative context
- SuRF-UK framework for sustainable remediation
- What next?: SuRF-UK Phase 2
- Conclusions



## SuRF-UK initiative

- Established in 2007, following the lead of SURF.
- UK-based collaboration of regulators, industry, academics and consultants. Open forum meetings.
- Independent co-ordination by CL:AIRE ([www.claire.co.uk/surfuk](http://www.claire.co.uk/surfuk))
- Focus on holistic sustainability assessment of
  - remediation input to high-level land-use planning
  - remediation input to overall site / project design ('Better by design')
  - remedial strategy selection and remediation technology selection
  - remediation implementation and verification
- Goals
  - A framework for assessing sustainable remediation
    - effective, practical, regulatory acceptance
  - Sustainability indicator review

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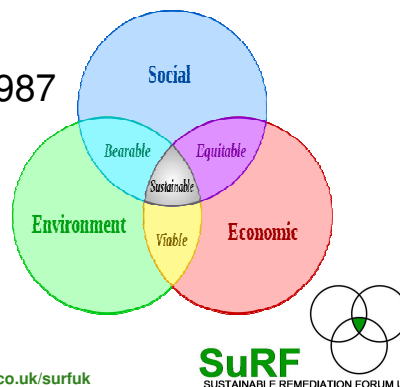
[www.claire.co.uk/surfuk](http://www.claire.co.uk/surfuk)



## Sustainable development

- *“development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs”*

Brundtland Commission, 1987



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[www.claire.co.uk/surfuk](http://www.claire.co.uk/surfuk)





## Is all remediation beneficial?

- Remediation seeks to reduce risks associated with soil and groundwater contamination, but also has other consequences, e.g.:
  - uses natural resources,
  - generates emissions;
  - can generate waste materials;
  - introduces health and safety risks.
- *Key issue:* Remediation is not sustainable *per se*, and certain strategies / technologies may cause more damage than they solve.

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## Recent British legal cases

- Corby BC found negligent over steelworks remediation:
  - 16 birth defects allegedly due to exposure to contaminated dust during remediation
- Cotswold Geotech director on first UK corporate manslaughter charge
  - Geologist died (2008) when site investigation trench collapsed



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## European Union legislative context

- Draft EU Soil Protection Framework Directive (Feb 2009, stalled): '**Remediation shall consist of actions on the soil...due consideration to social, economic and environmental impacts...**'
- EU Water Framework Directive: *achieve good status unless ..infeasible ..disproportionate cost ..and the preferred solution is considered best balance of social, economic and environmental costs [i.e. sustainable]*

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## UK Legislative context

- Planning Policy Statements 1 and 23: underpin sustainable development through Town & Country Planning process
- Environment Act 1995 (s4) requires environment agencies to '*contribute to the goal of achieving sustainable development*'
- Environment Act 1995 (s39): environment agencies required to '*take account of the likely costs and benefits*' in enforcing powers
- Part 2A EPA1990: Contaminated Land remediation must meet '*test for reasonableness*'

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## SuRF-UK definition

- *‘the practice of demonstrating, in terms of **environmental, economic and social** indicators, that the benefit of undertaking remediation is greater than its impact and that the optimum remediation solution is selected through the use of a balanced decision-making process’*

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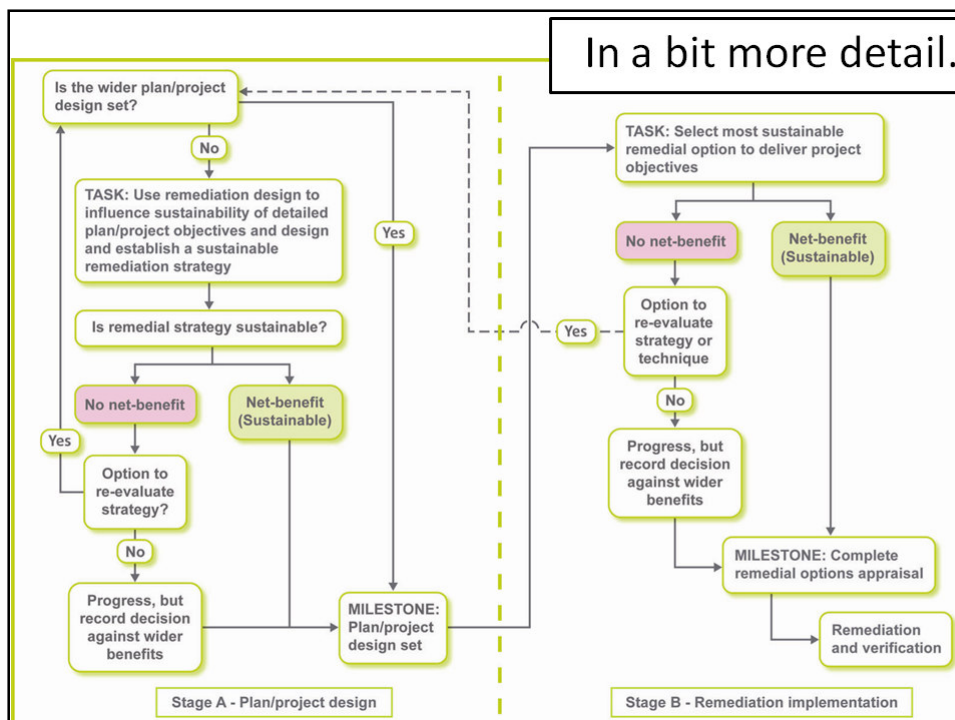
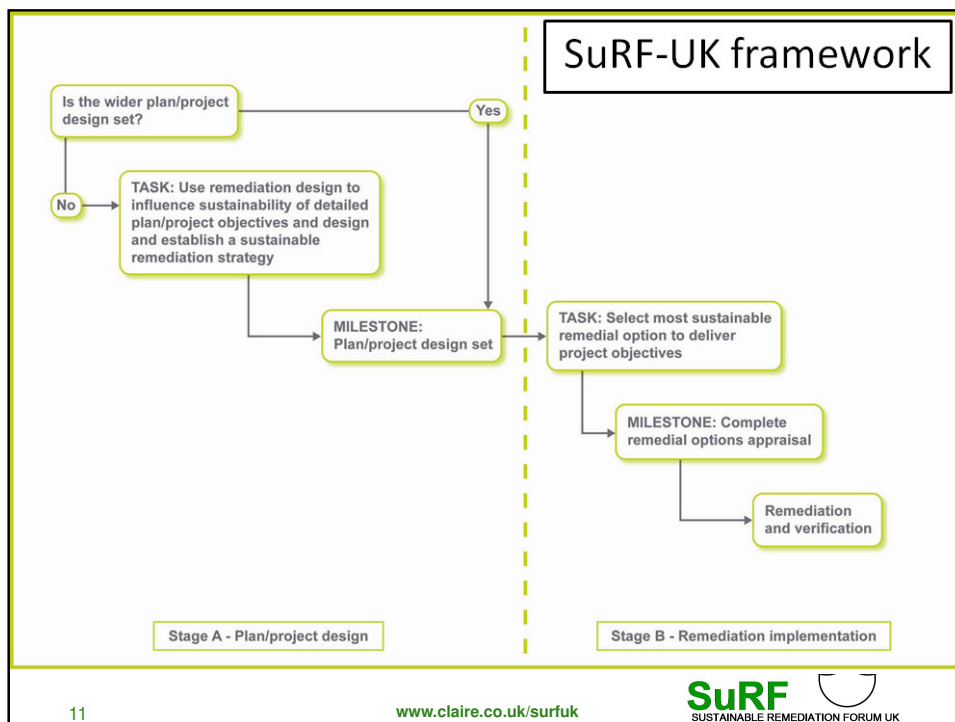


## SuRF-UK: Key principles

- Optimise risk-management based on consideration of social, environmental and economic factors, but always ensure:
  - Principle 1: Protection of human health and the wider environment
  - Principle 2: Safe working practices
  - Principle 3: Consistent, clear and reproducible evidence-based decision-making
  - Principle 4: Record keeping and transparent reporting.
  - Principle 5: Good governance and stakeholder involvement
  - Principle 6: Sound science

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## SuRF-UK assessment points

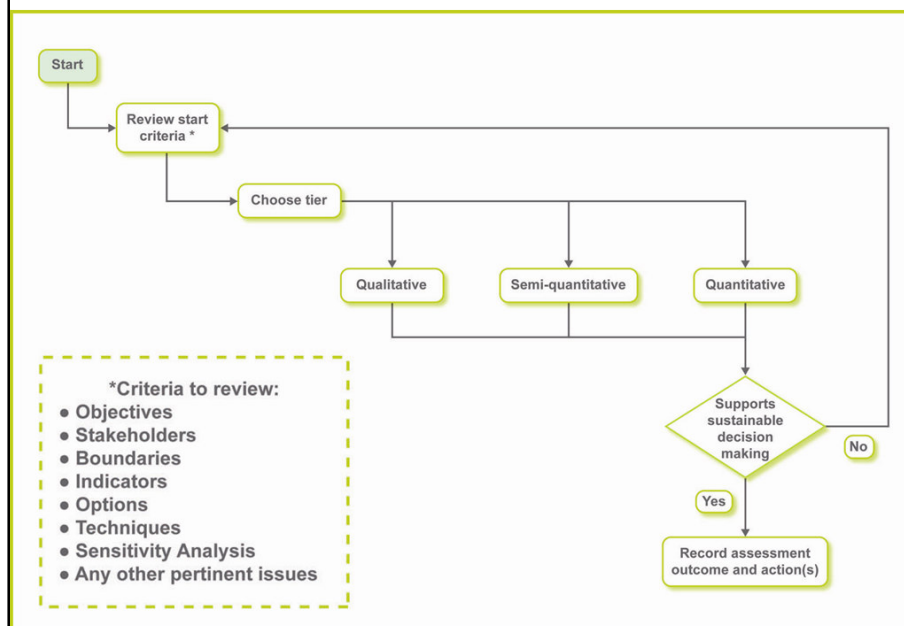
CLR 11 Stage	Risk Assessment	Options Appraisal	Implementation of Strategy
<b>CLR 11 Outcome of stage</b>	Robust conceptual model, risks and uncertainties identified.  Decision on need for remedial works, based on risk assessment.	Remedial options reviewed.  Preferred strategy identified.	Remedial action complete and verified.  Possible long-term monitoring.
<b>SuRF-UK Framework Stage A. Plan/project design</b>	Use remediation design to influence sustainability of detailed project objectives, to either <ul style="list-style-type: none"> <li>• Design-out unacceptable risks</li> <li>• Minimise action required to manage unacceptable risks</li> <li>• Look ahead and consider likely remedial options when developing risk assessment</li> </ul>		None
<b>SuRF-UK Framework Stage B. Remediation selection and implementation</b>	None	Select optimum remedial option to deliver project objectives	None

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## Tiered assessment



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## Possible sustainable remediation indicator categories

Environmental	Social	Economic
<ol style="list-style-type: none"> <li>1. Impacts on air (including climate change);</li> <li>2. Impacts on soil;</li> <li>3. Impacts on water;</li> <li>4. Impacts on ecology;</li> <li>5. Use of natural resources and generation of wastes;</li> <li>6. Intrusiveness.</li> </ol>	<ol style="list-style-type: none"> <li>1. Impacts on human health and safety;</li> <li>2. Ethical and equity considerations;</li> <li>3. Impacts on neighbourhoods or regions;</li> <li>4. Community involvement and satisfaction;</li> <li>5. Compliance with policy objectives and strategies;</li> <li>6. Uncertainty and evidence.</li> </ol>	<ol style="list-style-type: none"> <li>1. Direct economic costs and benefits;</li> <li>2. Indirect economic costs and benefits;</li> <li>3. Employment and capital gain;</li> <li>4. Gearing;</li> <li>5. Life-span and 'project risks';</li> <li>6. Project flexibility.</li> </ol>

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## Key points for SuRF-UK

- **Sustainability** is about Environment, Society and Economy, and short and long-term considerations (as per Brundtland);
- **Influence**: Introduce sustainability thinking into the process at the earliest possible stage to maximise net-benefit ('better by design'). Inform policy and regional spatial planning.
- **Holistic**: Scope of an assessment should initially be wide ranging. Then focus on those indicators that show variation between available options;
- **Efficient**: Use the lowest tier (simplest assessment method) that produces a reliable management decision;
- **Clarity**: Be absolutely clear what each sustainability category includes/excludes;

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## Regulatory acceptance: Foreword to report

CEAIRE

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John Palfalvy  
Policy Advisor, Brownfield Land  
Department of Communities and Local  
Government

Tom Coles  
Contaminated Land Policy Team  
Department for Environment, Food and  
Rural Affairs

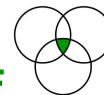
Trevor Beattie  
Director Strategy, Performance, Policy &  
Research  
Homes and Communities Agency

Gareth Hall  
Director General, Department for the  
Economy and Transport  
Welsh Assembly

Sheena Engineer  
Land Quality Policy  
Manager  
Environment Agency

Calum MacDonald  
Director of Environmental  
and Organisational Strategy  
Scottish Environmental  
Protection Agency

Theresa Kearney  
Principal Scientific Officer  
Northern Ireland  
Environment Agency within  
the Department of the  
Environment



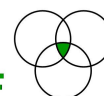
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## SuRF-UK Phase 2

- Objectives:
  - Trial the framework with real cases studies
  - Investigate the indicator categories further
    - Identify appropriate metrics for a high-tier assessment
  - Benchmark low-tier and high-tier assessment methods for the same site(s)
- Timescale
  - April 2010 to April 2011
- Format
  - As phase 1



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## Summary

- SuRF-UK assessment framework recently published
  - Applies at a range of **stages** (regional planning, project design / site-specific risk-assessment, remediation options appraisal, implementation)
  - Adopts a **tiered** structure
  - Is holistic. Start wide-ranging and narrow down quickly
  - Requires consultation with stakeholders
  - Is flexible and voluntary
- Phase 2 starts imminently
  - Indicator development and refinement
  - Road testing framework
  - Benchmarking assessment tools



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**Attachment 3**  
**Breakout Sessions**

## **Communication and Outreach Committee**

## SUSTAINABLE REMEDIATION FORUM COMMUNICATION & OUTREACH COMMITTEE

April 13 and 14, 2010

### Participants:

Stephanie Fiorenza (co-leader)	Jake Torrens (co-leader; phone)	Scott Denson	Nick Garson	Rick Wice
Maile Smith (co-leader; phone)	Kathy Adams	Dave Ellis	Robin Semer	

Note: Contact information is provided in Attachment 1.

### Topics Discussed:

1. **Develop Mission Statement** – The group discussed the importance of developing a mission statement for the Communication & Outreach Committee. A mission statement was drafted as follows, but all agreed it needs work: “To provide a unified and consistent message within SURF and externally and to effectively communicate SURF’s objectives, plans, and future goals.”
2. **Complete Tasks Associated with Battelle** – The group discussed the various tasks that needed to be completed before Battelle. See “Action Items” below for a listing of specific tasks. It was suggested during the general meeting to provide SURF sponsors with signs for sponsors’ booths at Battelle. Because sponsors have the SURF logo, the group decided that sponsors can make signs for their booth if desired. Use requirements for the logo are pending, and Dave Woodward will forward requirements to sponsors after Board approval.
3. **Reach Out to All Disciplines** – Current outreach efforts focus on academia and government, but the group believed that representation of complementary disciplines is also important. To make a concerted effort to obtain input from disciplines, the group decided to add another initiative – the Discipline Diversity Initiative – that would be under the larger umbrella of the Communications & Outreach Committee. The group thought that one task for this group would be to develop a presentation geared to the disciplines associated with the social and economic aspects of the triple bottom line.
4. **Finalize General SURF Presentation** – The group discussed the status of the draft “Who We Are” presentation. All agreed that the presentation would serve as a baseline set of slides for members use. Members could pick and choose which slides best fit the intended audience. The group discussed the need to develop a set of slides geared toward disciplines related to the economic and societal aspects of the triple bottom line. Two additional sets of slides are needed to address government and academic audiences.

In addition, the group discussed the “SURF Participants” slide and the value of using company logos to show the breadth of membership. The logos were removed in the last version because SURF members join the organization as individuals (vs. companies). New corporate sponsorship procedures may eliminate this concern. Some in the group indicated that if sponsor logos are used, only industry members will be represented. The issue was not resolved.

5. **Develop a General SURF Training Package** – The group discussed developing a general SURF training package, perhaps a short course that could be given at Battelle 2012, to educate people about sustainability and its applications. One advantage of the training is that it could be used as a revenue source. The group discussed that a discounted rate could be a benefit of SURF membership and that continuing education credits could be included.
6. **Use Web Site to Reflect Progress and Recruit New Members** – All agreed that the web site is up-to-date and a valuable resource for the organization. Some members expressed concern that there is no backup person to provide web site support. After the meeting, Kathy Adams volunteered to work with Maile and serve as the web site backup resource.

The group also agreed that the web site should be the tool used for the majority of deliverables and communication efforts. When paper is needed, recycled paper and soy inks are preferred.

7. **Develop a “Tagline” for SURF** – The Academic Outreach Initiative group suggested creating a “tagline” to give people a feel for what SURF is all about in a concise, clear manner. Everyone agreed to move forward with the idea.

8. **Communicate Between Meetings** – All agreed that it was important to establish a regularly scheduled conference call to resolve outstanding issues and continue the group's momentum. A conference call once a month was deemed sufficient for this purpose.
9. **Action Items** – Based on the discussions, the following action items were identified:
- Follow-up with the Board as soon as possible to resolve the following questions (Lead: TBD):
    - What are the financial goals of SURF?
    - What is the membership growth goal?
  - Revise committee mission statement for review. Lead: TBD
  - Work on tasks associated with SURF table at Battelle conference.
    - Finalize general flyer about SURF. Maile Smith (lead), Jake Torrens, and Nick Garson. Maile will send draft by end of week. Completed document to John Simon by May 1<sup>st</sup>.
    - Finalize generic poster about SURF and poster about sustainable remediation track. Rick Wice (lead), Pamela Dugan, Angela Fisher, Dan Cassidy, and Dave Woodward. Team will work to get completed information for posters to John Simon by May 1<sup>st</sup>.
    - Finalize banner. Leads: Maile Smith and Carol Baker
    - Order SURF candy. Stephanie will follow-up with Elie Haddad on status.
    - Create generic SURF business cards. Lead: Maile Smith
  - Establish a Discipline Diversity Initiative under the Communications and Outreach Committee. Lead: Maile Smith (will discuss with Board)
  - Review working draft of "Who We Are" presentation and forward comments to Jake in one week, by April 21<sup>st</sup>. Review draft is located in members section of web site under documents, working documents folder. Append your initials to a new filename. Final will be completed by the end of April. Lead: Jake Torrens
    - Tailor slides so they can be used for audiences of all employment sectors and expertise within the triple bottom line.
    - Develop a segment of slides geared toward academia and government employees. Leads: Academic and Government Employees Initiatives
      - Include a slide that addresses greenwashing head on and the fact that what SURF is doing is *not* greenwashing.
      - Include concept that "SURF didn't start because we wanted to do *no* remediation, SURF started because we want to do *better* remediation."
    - Revisit issues associated with "SURF Participants" slide.
    - Include benefits of membership slide.
  - Propose the SURF training package as a topic at the next meeting (SURF 14). A two-hour time slot would work, with one hour for general discussion and one hour for breakouts. Lead: Stephanie Fiorenza and Maile Smith
  - Consider updating web site as follows (Lead: Maile Smith):
    - Post minutes from Board of Trustees meetings on web site. (Complete and Ongoing)
    - Add listing of chapters and liaisons on web site for contact purposes.
    - Add "Why Join SURF?" tab.
    - Consider posting employment or internship opportunities to attract students
    - Find out from K&L Gates the necessity of a disclaimer if the web site serves as a clearinghouse of information (i.e., information vs. links to information).
  - Forward "tagline" ideas to Michelle Thomson at michelle.m.thomson@usa.dupont.com.
  - Hold monthly conference calls, and include leaders of Academic Outreach and Government Outreach Initiatives on the distribution list. Timing: after Battelle conference

## Brainstorming:

Additional topics other than those listed above were discussed in the context of achieving SURF's overall mission. These topics are summarized in the table below.

<b>SURF Mission Topic</b>	<b>Brainstorming Ideas</b>
Advancing the science and exchanging professional knowledge	<p>Publish a SURF study (e.g., comparison of different tools).</p> <p>Serve as a link allowing members and non-members to contact the right people associated with the triple bottom line.</p> <p>Serve as a clearinghouse for case studies via the web site.</p> <p>Host an online information forum on a regular basis about case studies, focusing on a live sharing of information among participants.</p>
Developing best practices (internal)	<p>Develop a post-meeting survey to obtain feedback and reactions from audience members after a SURF member presentation.</p> <p>Track external education and outreach activities on web site calendar (include where, who, when, and what).</p> <p>Require members who present externally to provide feedback and reactions to Communications &amp; Outreach Committee.</p>
Educating and reaching out	<p>Publish an electronic quarterly newsletter to be distributed beyond current membership (includes "President's Message").</p> <p>Develop advertising brochure to be used for many audiences (includes mission statement).</p> <p>Consider using communication tools that appeal to younger generation (e.g., establish a SURF Facebook page or Twitter account).</p>

## **Academic Outreach Initiative**

## SUSTAINABLE REMEDIATION FORUM ACADEMIC OUTREACH INITIATIVE

April 13 and 14, 2010

### Participants:

Mike Miller (leader)	Dan Cassidy	Steven Murawski
Stewart Abrams (scribe)	Pamela Dugan	Michelle Thomson
Paul Anderson	Kevin Finneran	Dan Watts

Note: Contact information is provided in Attachment 1.

### Topics Discussed:

1. **Develop Mission Statement** – The group discussed the importance of developing a mission statement for the Academic Outreach Initiative. Before a mission could be drafted, the group agreed that it would need clarification from the Board of Trustees on such items as SURF's ability to provide grants and/or funding for research projects and letters of support for the same. The Board must also determine membership levels, particularly if academics and educators could take advantage of the same reduced fees as government. The group's proposal involved three levels of membership: (1) student, (2) government, academics, educators, and (3) regular. The mission statement will be drafted after issues are clarified.
2. **Develop Guidelines for Student Chapters** – Based on the panel discussion (see page 6 of the notes) and enthusiasm for student chapters, the group agreed that guidelines are necessary. Although each school will have specific guidelines for student chapters, SURF will need to develop an application form, a process for submitting applications (i.e., website), and general criteria used to determine the establishment of new chapters.
3. **Organize and Fund a Student Paper Competition at Battelle** – The group continued their SURF 12 discussion about organizing and funding a student paper competition focused on sustainable remediation. The group decided that next year's Battelle bioremediation conference would serve as a great forum for this competition. As discussed at SURF 12, it is necessary to outline a plan about the proposed competition and funding may need to be requested from the Board of Trustees.
4. **Reach Out to All Disciplines** – The group continued their SURF 12 discussion of the importance of involving diverse fields beyond environmental sciences and engineering (e.g., sociology, economics, public policy). Adding onto the ideas discussed at SURF 12, the group suggested making a detailed, concerted effort to reach out to other disciplines through advertising, guest lectures, universities, and SURF members' connections. After gathering with the larger Communications and Outreach Committee, all seemed to agree that another initiative might be necessary to ensure that SURF was reaching out to a variety of disciplines. Added to the Academic Outreach Initiative and the Government Outreach Initiative would be the "Discipline Diversity Initiative."
5. **Develop a General Presentation Tailored to Academia** – The group discussed the value of developing a general presentation tailored to academic audiences who may not be as familiar with remediation in general. The group agreed that the presentation should (1) introduce audience to the basics (e.g., define terms such as remediation and sustainable remediation), (2) avoid jargon, (3) focus on fundamental science and engineering as appropriate to the audience, and (4) re-visit existing technologies through the triple bottom line. All agreed that the general presentation being developed by the larger Communications and Outreach Committee could contain some or all of these slides, depending on the audience.
6. **Promote Information Exchange** – As discussed at SURF 12, the group thought that establishing a SURF Speakers' Bureau was a good idea. The goal would be to facilitate frequent communication and the cross-pollination of ideas among key academics and SURF. As a first step, the group will identify schools that are already involved with sustainable remediation and offer guest speakers as appropriate.
7. **Consider Establishing SURF Research Foundation** – The group discussed establishing a SURF Research Foundation to offer funding for research and innovative academic programs. Some goals of the foundation could be to improve existing remedial technologies and develop interdisciplinary sustainable remediation courses. SURF could provide grants and the members of the Academic Outreach Initiative could serve as the clearinghouse for proposals. Fellowships for students could be provided, with a guaranteed job for a specific number of years

upon graduation. SURF could provide a *de facto* letter of support for research applicants.

All seemed to agree that SURF needs either a mechanism to identify research needs or criteria for screening research needs. In addition, industry should provide a list of skills that are needed for the remediation industry.

8. **Develop a “Tagline” for SURF** – The group discussed creating a “tagline” to give people a feel for what SURF is all about in a concise, clear manner. The group suggested this idea to the larger Communications and Outreach Committee, and everyone agreed to move forward with the idea.
9. **Action Items** – Based on the discussions, the following action items were identified:
  - Follow-up with the Board as soon as possible to resolve the following questions (Lead: Dan Watts):
    - Can a 501(c)(3) organization provide grants and/or funding?
    - Do you approve of the following recommended revised membership categories: student, government/educator, and general?
    - Is there a potential conflict of interest associated with providing letters of support to researchers?
  - Develop committee mission statement. Lead: TBD
  - Develop guidelines for student chapters. Lead: Dan Watts
  - Fund student paper competition at Battelle. Lead: Pamela Dugan
    - Make necessary contacts and outline a process to be described in an e-mail by April 26<sup>th</sup>.
    - Finalize process by May 24<sup>th</sup>.
  - Establish a Discipline Diversity Initiative under the Communications and Outreach Committee. Lead: TBD
  - Develop a presentation tailored to an academic audience. Use the “Who We Are” presentation as a starting point. Test-drive the presentation at the next SURF meeting (SURF 14). Lead: TBD
  - Identify academics whose interests overlap with SURF and who might be interested in joining the organization as a first step toward gathering information to form a Speakers’ Bureau. Effort will be started by surveying SURF members requesting their academic contacts—in process. Lead: Katie Lewis
  - Develop an example letter of research support/draft procedure for processing applications from academics for research support. Note, “support” means “agreement with mission,” rather than financial at this time. Lead: Stew Abrams
  - Identify potential speakers to participate in and be invited to SURF 14, ensuring that social and economic topics relating to sustainable remediation are represented. Lead: Mike Miller, with possible help from Tom Sale
  - Forward “tagline” ideas to Michelle Thomson at [michelle.m.thomson@usa.dupont.com](mailto:michelle.m.thomson@usa.dupont.com).



## **Government Employees Outreach Initiative**

**SUSTAINABLE REMEDIATION FORUM  
GOVERNMENT EMPLOYEE OUTREACH INITIATIVE**

April 13 and 14, 2010

Participants:

Carol Baker (leader)	Todd Martin	Steven Murawski	Dave Woodward
Paul Hadley	Amanda McNally (phone)	Mike Sowinski (phone)	

Note: Contact information is provided in Attachment 1.

Topics Discussed:

1. **Revise Conflict of Interest Statement** – The group discussed the need of developing a condensed version of the existing conflict of interest statement and sharing it with government employees. The statement was drafted by K&L Gates to address the potential conflict of interest for government employees in joining SURF. All agreed that a unified and improved message should be included (see #2 below). Emphasis should be placed on the fact that SURF is a nonprofit organization and, thus, cannot lobby or influence policy. In addition, SURF's focus should be stated: information sharing and education. The Massachusetts attorney views on joining SURF should also be included in the revised document.
2. **Develop Unified Message for SURF** – The group discussed the importance of developing an improved and unified message of SURF's goal and role. All agreed that the message should emphasize that SURF is a forum, which by definition means that SURF is interested in capturing all opinions and viewpoints and finding a common ground. The group agreed that the goal is to find common ground between government employees, consultants, and industry members to move sustainable remediation forward in a meaningful manner. All agreed that a unified, strong message would help avoid the perception that sustainable remediation is something that SURF "cooked up." In addition, the group recognizes that fear of change colors individuals' perceptions.
3. **Develop Modules for Government Employees** – The group agreed that developing sustainable remediation modules for government employees with the intent to solicit discussion and encourage them to join SURF. Ideas for approaches are listed below under #6.
4. **Identify Government Agencies for Outreach Activities** – The group discussed the need to identify which government agencies would welcome presentation (and subsequent discussion) of a SURF sustainable remediation module. The goal would be to start by reaching out to government employees and their agencies who are most interested in and open about sustainable remediation concepts.
5. **Maximize Exposure to Government Employees** – The group discussed making a presentation at the Association of State and Territorial Solid Waste Management Officials (ASTSWMO) meeting in 2011 to maximize SURF's exposure to government employees. The presentation would focus on educational outreach and thought-provoking questions and topics to start the discussion.
6. **Action Items** – Based on the discussions, the following action items were identified:
  - Develop condensed version of conflict of interest statement and share with government employees (Lead: Carol Baker)
    - Share condensed version with government employees via e-mail.
    - Encourage them to join SURF.
  - Develop unified message for SURF. (Lead: Todd Martin with Communications and Outreach Committee)
    - Develop in conjunction with Communication and Outreach Committee.
    - Use "Who We Are" presentation as starting point.
    - Share with Board of Trustees first, and then share with all members to ensure that members agree with message.
  - Develop sustainable remediation modules with government employees as the intended audience. (Lead: Carol Baker and Dave Woodward)
    - Work with existing government employee SURF members to develop modules.

- Identify issues, problems, and needs for change in traditional remediation to facilitate discussion and thoughts about how to resolve.
  - Outline issues in such a way to solicit internal agency dialog.
  - Call attention to the resources currently being used as a way of discussing if there is a smarter way of doing things.
- Present case studies.
  - Include real case studies that have not been successful (e.g., CA perchlorate).
  - Include successful case studies.
  - Include some case studies where active remediation is warranted and there was clearly a benefit (to show that sustainable remediation can mean active remediation).
- Include information from SuRF-UK to show what others are doing.
- Recognize and admit that risk-based corrective action and monitored natural attenuation are good approaches that have been abused.
- Identify questions, and admit that we don't have all of the answers.
- Identify the percent of remedies that have met goals (low percentage), and realize remedy is not meeting goals and not sustainable. Discuss the consequences of not meeting cleanup numbers and whether result is that sustainable or not.
  - Use Duwamish as an example.
  - Use example of solvent recovery systems in New England. For \$120MM remedy, only 50% of dense, nonaqueous phase liquid (DNAPL) can be recovered with no resulting change in risk.
  - Encourage dialogue about whether it is time to do remediation differently.
- Give a “dry run” presentation to government employees who are already associated with or interested in SURF to ensure that the presentation is objective (education vs. advocacy).
  - California Department of Toxic Substances Control (DTSC) Green Team
  - Government employees participating in Interstate Technology and Regulatory Council (ITRC) Green and Sustainable Remediation (GSR) team
- Identify Government Agencies for Outreach Activities. (Lead: Carol Baker and Paul Hadley)
  - Work with Communication and Outreach Committee to develop first (i.e., most interested and open to sustainable remediation concepts), second, and third tier government agencies.
  - Identify SURF member to develop implantation plan with the Board.
- Make a presentation at the ASTSWMO meeting in 2011. (Lead: Carol Baker and Paul Hadley)
  - Work through Heather Nifong at the Illinois EPA.
  - Ask Paul Hadley and John Scandura (both SURF members and with California DTSC) to present with another SURF Board of Trustees member.
  - Potentially use “Who We Are” presentation and one of the modules from #3 above.
  - Decide if better to approach greater ASTSWMO or more focused Greener Cleanups Task Force as a first audience.

## **Technical Initiatives Committee**

## SUSTAINABLE REMEDIATION FORUM TECHNICAL INITIATIVES COMMITTEE

April 13 and 14, 2010

### Participants:

Brandt Butler (lead, Metrics Initiative)	Mohit Bhargava	Erik Petrovskis	Brian Solomon
Paul Favara (lead, LCA Process Initiative)	Rick Gillespie	Dick Raymond	Vipul Srivastava
Karin Holland (lead, Framework Initiative)	Bill Lantz (phone)	Robin Semer	Debbie Taege
Robert Armstead	Lorraine Larsen-Hallock (phone)	John Sohl	Karina Tipton

Note: Contact information is provided in Attachment 1.

### Topics Discussed:

- List Problems Being Addressed** – The group listed the problems being addressed for all technical initiatives, with inconsistency as a common theme. A framework is needed because there is an inconsistent approach to maximizing the net benefit of social, economic, and environmental considerations. Similarly, a lack of appropriate metrics exist and there is an inconsistent approach to implementing LCA into projects.
- Define Terms Associated with Initiatives** – The group agreed that defining the terms framework, metrics, and LCA for the purposes of SURF is necessary. The group attempted to define these terms as follows:
  - Framework – The group decided that the framework should be thought of as the overall vision to maximize the considerations of the triple bottom line.
  - Parameters and Metrics – The group defined parameters as the considerations – impacts – stressors of environmental, social and economic importance (e.g., global warming potential or groundwater resources). Metrics are the measured burdens associated with a remedial action (e.g., carbon dioxide emissions or groundwater use).
  - LCA Process – After some discussion, the group decided that the LCA initiative was a process for individuals to follow, not a tool to use. As a result, the group decided to change the name of the effort to the LCA Process Initiative (vs. LCA Initiative). The word “process” may be replaced by “methodology” after additional discussions. The LCA process will help individuals make more sustainable decisions for a specific remediation project and will help them decide the most appropriate metrics and impact assessment methods to use when performing a sustainability assessment. In addition, the LCA process will help individuals set appropriate boundaries for aspects that should be considered as part of the sustainable assessment.
- Define Additional Terms Associated with Sustainable Remediation** – The group agreed that creating a glossary of key terms was necessary. Some suggested using the glossary from the framework document developed by SuRF-UK as a starting point. All seemed to agree that providing the different contexts in which the terms have been used is important.
- Develop Action Plan, including Deliverables** – The group developed the following action plans for each initiative:
  - Framework – The group will critically evaluate and analyze the existing framework(s) for performing sustainability assessments. The resulting deliverable may include a flow diagram that covers the entire remediation timeline, with general questions to be asked at each project milestone. The deliverable will also include SURF’s vision for a holistic tool to implement sustainable remediation.
  - Metrics – The group will critically evaluate available metrics as to their sustainability in relation to social, economic, and environmental considerations. The group will also evaluate the differences between parameters and metrics and identify the metrics that are missing from current practice.
  - LCA Process – The group will identify existing sustainability processes and methodologies and will evaluate impact assessment methods that are better suited for remediation projects. From this evaluation, a deliverable will be prepared to provide guidance to users on how to conduct a life-cycle assessment for remediation projects. The methodology will focus on properly planning an assessment, identifying what should be evaluated in the assessment and the boundaries of the assessment, developing an inventory for remediation projects, estimating impacts, verifying the quality

of data used in impact assessments, interpreting results, addressing an uncertainty assessment, and documenting the LCA. It is anticipated that the guidance document developed as part of this technical initiative can be converted into a training class for the 2011 Battelle meetings in Reno, Nevada. Guidance on how to present resources and references will also be provided.

5. **Action Items** – Based on the discussions, the group committed to developing an annotated outline for each initiative deliverable by the next meeting. (Lead: Brandt Butler, Paul Favara, and Karin Holland)