

Framework for Integrating Sustainability into Remediation Projects

Remtech Workshop, Banff Alberta

October 19, 2011

Presented by : Stella Karnis





Presentation Outline

- Introduction
- The Sustainable Remediation Forum (SURF)
U.S.
- What is Sustainable Remediation?
- Why was the Framework Developed?
- Description of the Framework
- Conclusions



Introduction

- The U.S. Sustainable Remediation Forum (SURF) created this framework that was published in the Spring 2011 Edition of Remediation Journal (June 2011).



The Sustainable Remediation Forum (SURF) U.S.

- Professional organization formed in 2006.
- Forum for collaborating, educating and advancing the application of sustainability during remediation
- Members include:
 - Industry
 - Regulators
 - Government
 - Consultants
 - Academics
 - Vendors
- For more information, please visit the website at www.sustainableremediation.org



What is Sustainable Remediation?

- In the Framework, sustainable remediation is defined as:
 - “ a more holistic approach aimed at balancing the impacts and influences of the triple bottom line of sustainability (i.e. Environmental, societal and economic) while protecting human health and the environment.” (SURF, 2011)

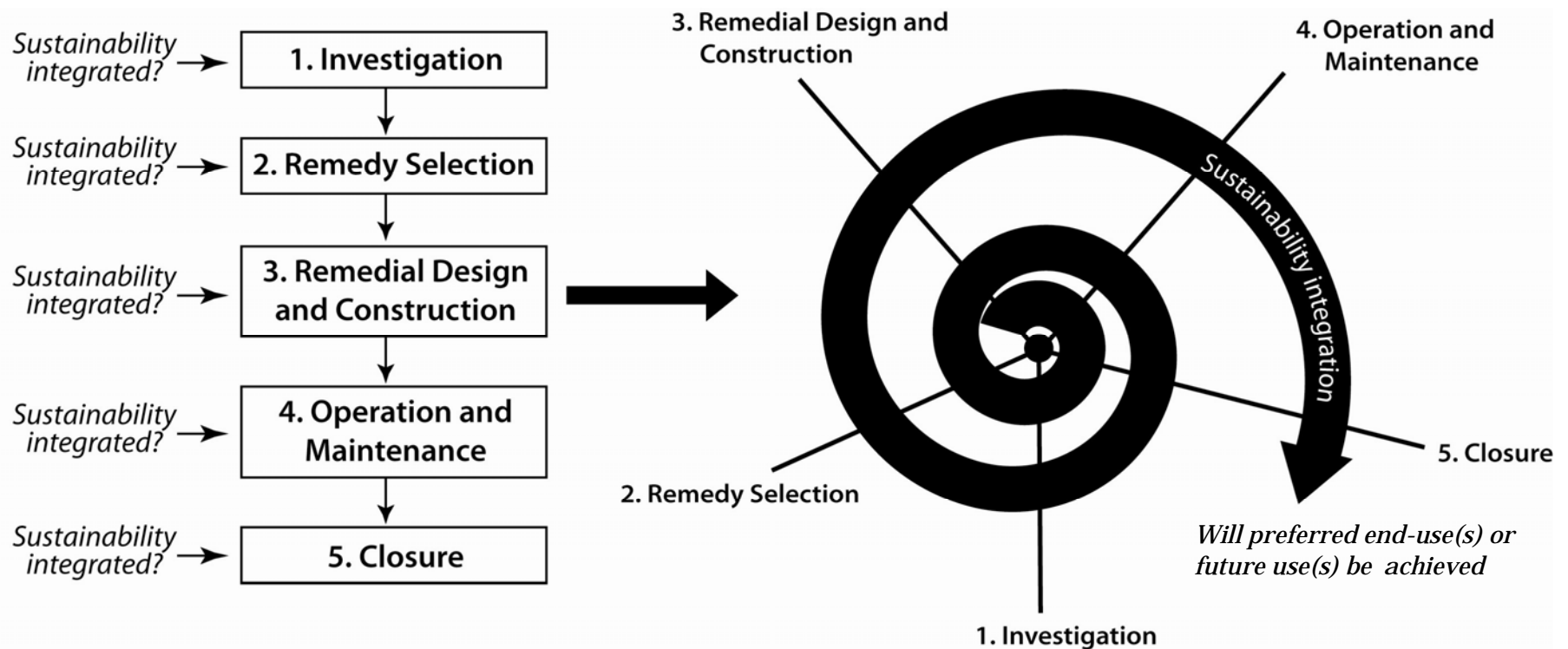


Why was the Framework Developed?

- The need for an sustainable remediation approach that is:
 - Systematic and consistent
 - Flexible and easy to use
 - Holistic and iterative
- Guidance for all stakeholders involved in the remediation project.
- Collaborative decision-making

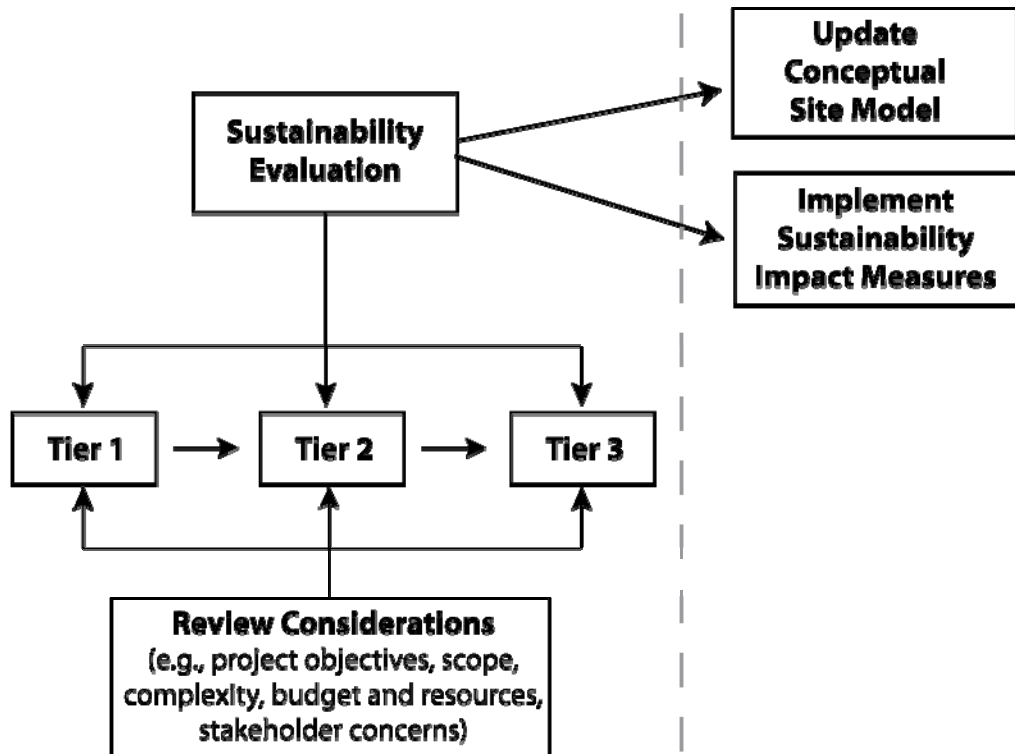
Description of the Framework

Move from linear to holistic (with future-use in mind)



Description of the Framework

Tiered Sustainability Evaluation



- *Objectives:* Project life cycle and phase specific
- *Scope:* not necessarily defined by project boundaries
- *Complexity:* as a general rule of thumb Tier level increases with the level of complexity
- *Budget and resources:* needs to be balanced. Create tangible value through sustainable practices
- *Stakeholder Concerns:* encourage collaboration – evaluation in layman's terms.

Description of the Framework

Tiered Sustainability Evaluation

Tier	Type of Analysis	Applicability	Available Approaches
Tier 1	Qualitative evaluation	Smaller scale sites with time/budget/resource constraints; low complexity	<ul style="list-style-type: none"> - Checklists - Rules of thumb - Matrices
Tier 2	Semi-quantitative analysis	Moderately complex sites	<ul style="list-style-type: none"> - Spreadsheets - Scoring and weighting - Simple cost-benefit analysis
Tier 3	Quantitative analysis	Significantly complex sites	<ul style="list-style-type: none"> - Life-cycle assessment - Detailed cost-benefit analysis - Social return on investment analysis

Description of the Framework

Tiered Sustainability Evaluation - Metrics

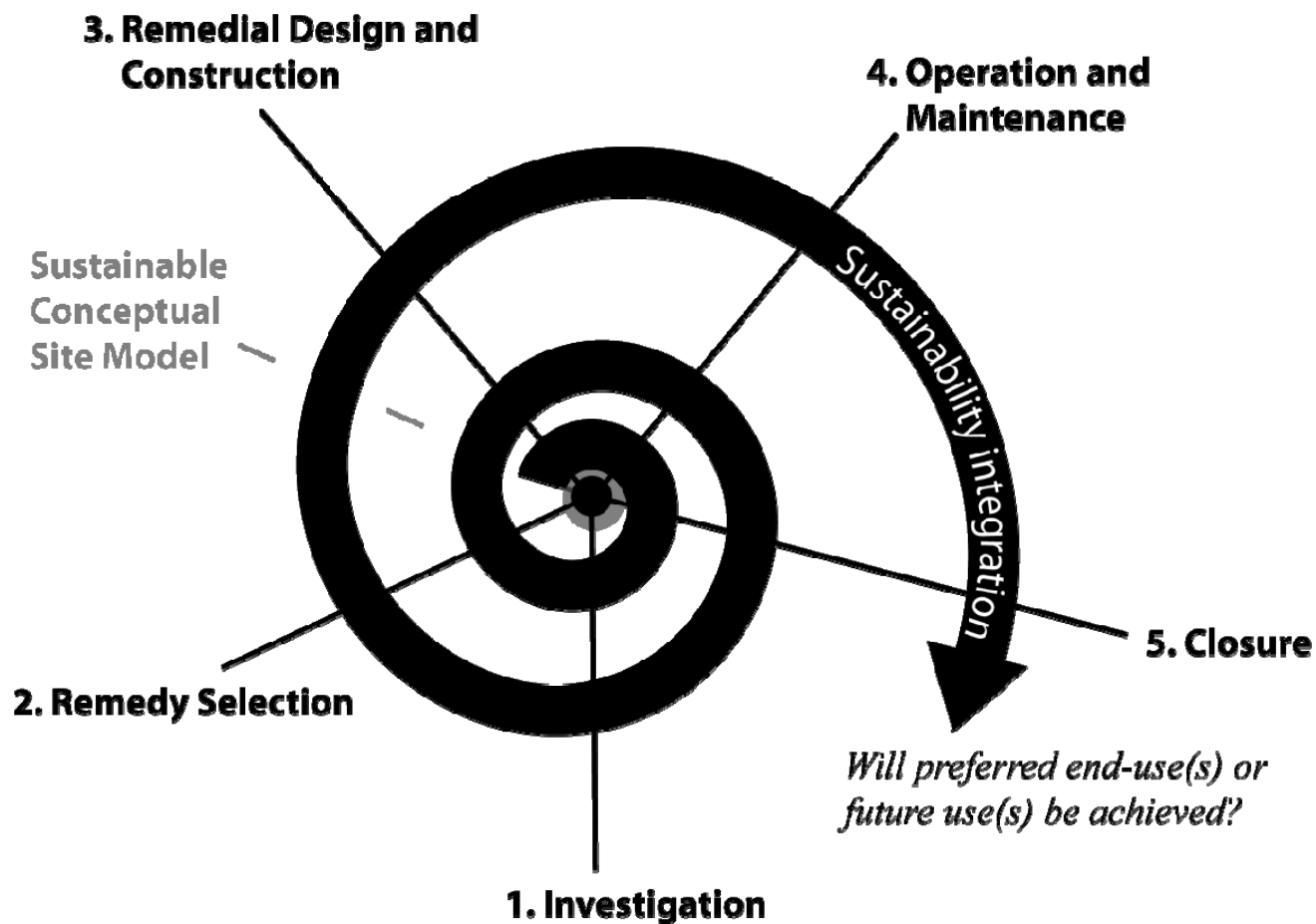
Example Metrics:

Environmental	Social	Economic
<ul style="list-style-type: none">- Impacts on air (including climate change)- Impacts on soil- Impacts on water- Impacts on ecology- Use of natural resources- Waste generation- Intrusiveness	<ul style="list-style-type: none">- Impacts on human health and safety- Ethical and equity considerations- Impacts on neighborhoods or regions- Community involvement and satisfaction- Compliance with policy objectives and strategies	<ul style="list-style-type: none">- Direct costs and benefits- Indirect costs and benefits- Employment and capital gain- Project risks- Project flexibility

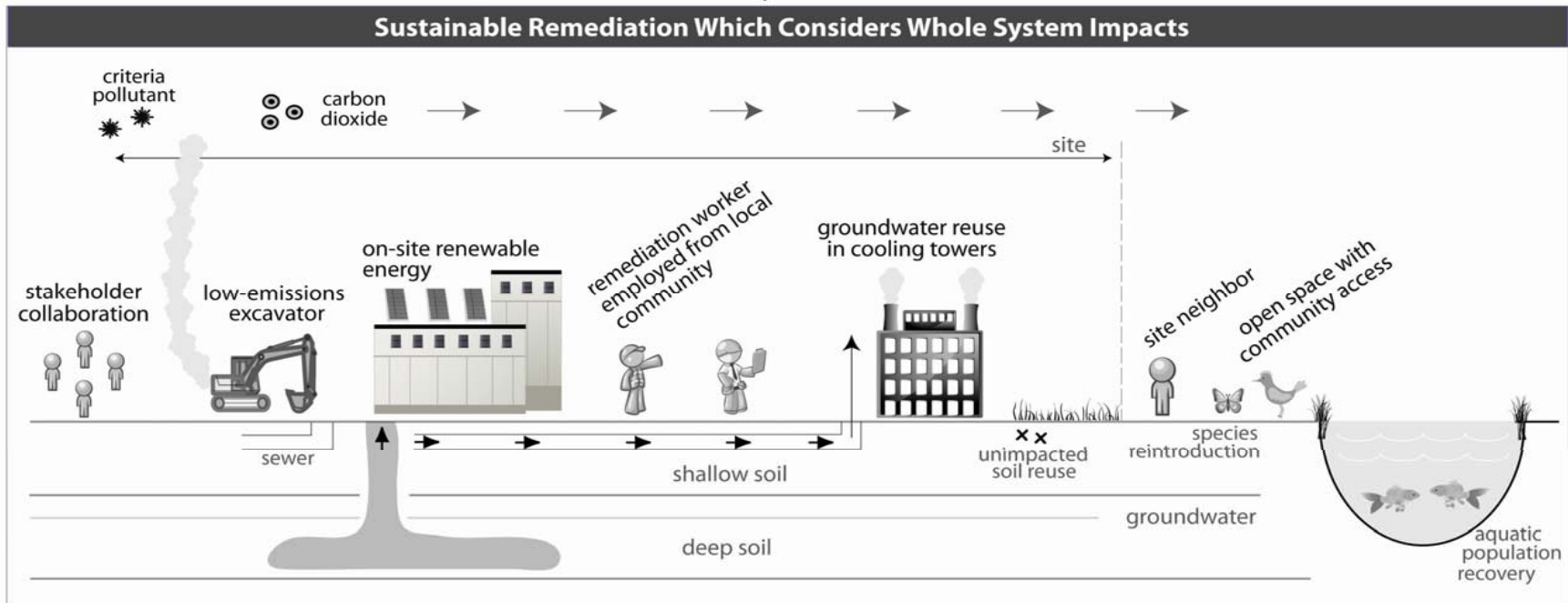
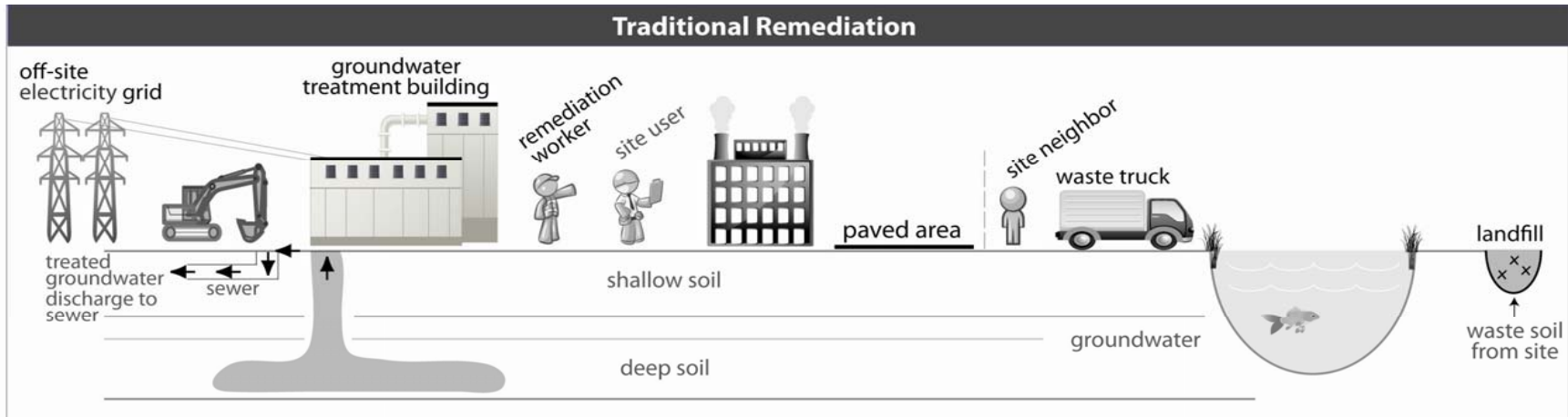
(adapted from SuRF-UK, 2009)

Description of the Framework

Sustainable CSM



Description of the Framework - Sustainable CSM





Description of the Framework

Sustainability Impact Measures Implementation

- The sustainability evaluation and CSM identify sustainability impacts.
- These impacts may be reduced through the implementation of measures such as:
 - Re-use and recycle material (soil, construction etc)
 - Implementing *is situ* technologies where feasible
 - Using renewable energy for system operation
 - Reducing transportation needs
 - Provide training to local workers
 - Conducting collaborative community events



Description of the Framework

Integration of Sustainability Elements into Traditional Assessments

- Traditional assessments
 - Human health risk assessment
 - Environmental impact assessment
- Traditional assessments do not address sustainability impacts associated with remediation activities
- *Site impacts and remediation impacts should be balanced*



Description of the Framework

Stakeholder Involvement

- Framework should be used by all stakeholders
- Collaboration should take place *throughout* the remediation project and should be initiated early
- Framework provides many opportunities for collaboration through its process-based and iterative process
- This collaboration can lead to:
 - Access to local resources
 - Understanding of community interest
 - Industry service provider input earlier in the process



Description of the Framework

Documentation and Recordkeeping

- Enables users to track how the Framework is applied
- Should occur at the initiation of a project
- Should be updated throughout the project
- Examples of records:
 - Sustainability evaluation description and results
 - Metrics selected to support the sustainability evaluation
 - Rationale and approach for updating the sustainable CSM
 - Remediation and sustainability performance data collected



Summary

- The Framework describes an approach for:
- Planning for the preferred end-use(s) or future use(s) of a site
- Performing a tiered sustainability evaluation
- Integrating sustainability into the CSM
- Identifying sustainability impact measures
- Performing a whole-system sustainability assessments



Recommendations

- Engage stakeholders throughout the project
- Implement a disciplined planning strategy
- Select an appropriate sustainability analysis tier
- Choose metrics carefully
- Incorporate sustainability at the beginning of a project
- Compile and implement sustainability impact measure
- Balance site impacts and remediation impacts



Where can I find the Framework?

- Publication in Spring 2011 Edition of Remediation Journal (June 2011)
- Available on SURF's website:
www.sustainableremediation.org (June 2011)



Acknowledgements

- **Karin Holland (our fearless leader)**, Haley & Aldrich
- **Raymond E. Lewis**, Sunpro, Inc.,
- **Karina Tipton**, Brown and Caldwell
- **Carol Dona**, U.S. Army Corps of Engineers
- **Erik Petrovskis**, Geosyntec Consultants
- **Louis P. Bull**, Waste Management
- **Deborah Taege**, The Boeing Company
- **Christopher Hook**, Tetra Tech NUS



Questions?