

# Sustainable Remediation Experiences

## Sustainable Remediation Forum


Federal Remediation Technologies Roundtable  
November 6, 2014

Michael E. Miller, CDM Smith, SURF  
Brandt Butler, URS, SURF



# Order of Presentation

- Lessons Learned from SR Implementation
- Case Studies
  - Gilbert-Mosley
  - Oakland Army Base
  - Sustainable Return on Investment
- Conclusions: the Value of SR



# Lessons Learned from SR Implementation





# Successful Projects


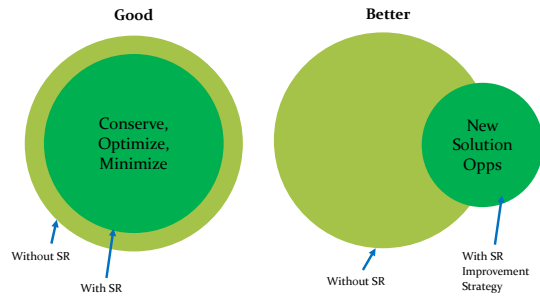
- Cost Savings – New means to identify cost reductions
- SR underpins planning - Big projects with high visibility
- Site owner believes in SR value - Project to make a statement
- Sustainability in organizational decision making



# Early and Better SR Integration



# SR identifies new solution space



SR should underpin technologies and alternatives developed

CSM RAO

SURF

the corner of ...

**Gilbert & Mosley Streets**

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Gilbert-Mosley

Project overview:

- 3,850-acre site in Wichita, Kansas
- Innovative approach to remediate contaminated groundwater
  - Chlorinated solvents
  - 4-mile long plume
- Protected public health, while promoting economic development

When SR considered:

- Before RI/FS

BEFORE AFTER

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Gilbert-Mosley

What was done:

- Collaborated with regulators to devise a preemptive voluntary cleanup approach
- Worked with the city to pursue:
  - Tax increment financing of remediation
  - Liability waivers for property owners
  - Property loans
  - Cost sharing formula with major PRP
- RI/FS
- Designed/constructed groundwater P&T
  - Treated water reuse

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Gilbert-Mosley

Estimated value derived:

- Risk-based approach → alternate cleanup levels
  - Reduced volume of groundwater requiring treatment by 40%
  - Saved ~\$8 million
- Helped promote > \$300 million in economic development through fast, aggressive cleanup

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Gilbert-Mosley

Estimated value derived (continued):

- Treatment building
  - Includes environmental education center
  - Reused treated groundwater for water features

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# Oakland Army Base



## OAB Redevelopment

Project Overview

- Former Oakland Army Base (OAB) decommissioned in 1999
  - ~7,000 jobs lost
- Public-Private partnership
- #1 priority from pre-development stage: social, economic, and environmental well-being of West Oakland residents
- Remediation initiated before and integrated with redevelopment







## OAB Redevelopment

Pre-Planning

- Plans evaluated for:
  - Economic benefits to City/community, environmental impacts, and land use compatibility
  - All involved extensive trade-offs and public-private partnerships to fund infrastructure improvements
- Best land use → extension of Port services
- Local labor/employment rated as higher benefit than tax revenue





## OAB Redevelopment

Sustainability + Redevelopment

- Long-term quality-of-life benefits
  - Recycling operations out of West Oakland
  - Divert truck operations to rail (↓ VMT/emissions, injury, cost)
  - Local labor, job training, “banned the box”
  - Conformance with City’s ECAP
- RAP + RMP for construction/operations
- >600 compliance and mitigation measures
  - Major focus: **air quality**







## OAB Redevelopment

Transparency + Communication

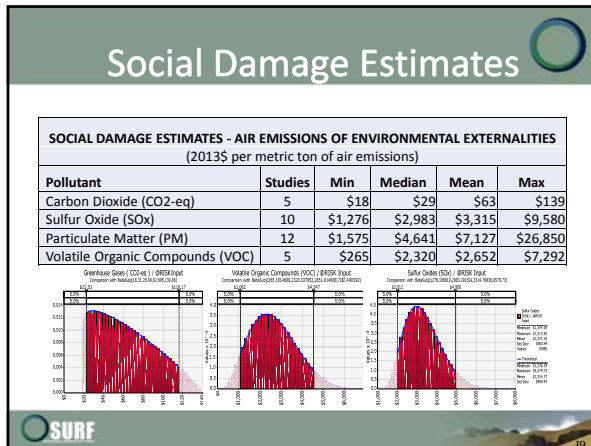
- Air quality plans developed with broad stakeholder input (developer, City, Port, regulators, community)
- Web-based data portal for air monitoring results in near-real time
  - Interactive, easy-to-use maps and graphs
  - Basis for transparent and productive stakeholder discussions
- Quarterly meetings for reporting, feedback, and collaboration on future plans

## Sustainable Return on Investment

Landfill Mining Project



### Sustainable Economics

Impact category	Incremental Impact (MT)	Value 2013\$
Economic Benefit		\$2,233,442
Climate change (CO2-eq)	14,426	\$904,447
Particulate Matter Formation (PM)	(368)	(\$2,619,934)
Terrestrial acidification (SOx)	(10)	(\$32,830)
Photochemical oxidant formation (VOC)	(0.06)	(\$166)
<b>Net Benefit</b>		<b>\$484,959</b>
<b>FROI</b>		<b>500%</b>
<b>sROI</b>		<b>109%</b>

### sROI Summary

- Provides a more comprehensive picture of investments
- Translates social and environmental impacts into economic terms
- Includes an uncertainty analysis to demonstrate the likelihood of realizing costs and benefits
- Combines objective data and expert judgment
- Generates results that are defensible and transparent

### Conclusions

- Sustainable remediation best considered early and throughout project
- Social & economic benefits are reachable through environmental considerations
- Sustainable remediation provides broad and cost effective solutions
- sROI (environmental, economic, social) → single index

### Questions?

Additional Contributors:

- Paul Favara, CH2M Hill
- Maile Smith, Northgate Environmental Management
- Melissa Harclerode, CDM Smith
- Barbara Maco, Wactor & Wick
- Amanda McNally, AECOM

Practices demonstrated through case studies:  
<http://www.sustainableremediation.org/>