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US and EU Perspectives on Green and Sustainable Remediation, Part 4 Sponsored by: U.S. EPA Office of Superfund Remediation and Technology Innovation

Delivered: March 6, 2012, 10:00 AM - 12:00 PM, EST (15:00-17:00 GMT)

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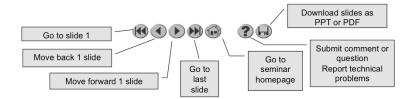
Moderators:

Carlos Pachon, Dietmar Müller, and Paul Bardos

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### Agenda

#### Introductions and Background

Carlos Pachon, U.S. EPA Office of Superfund Remediation and Technology Innovation

### Greening Superfund Cleanups, Apache Powder Project, Arizona

Andria Benner, U.S EPA Region 9 Remedial Project Manager

### TRIANGLE Zatec

Jan Vaněk, DEKONTA

#### Austria's New MCEA-Tool

Moritz Ortmann, Kommunalkredit Public Consulting GmbH Gernot Döberl, Environment Agency Austria Werner Frühwirth, denkstatt GmbH

#### **EPA Greener Cleanup Developments**

Carlos Pachon

#### **Updates on International Initiatives**

Paul Bardos, r3 Environmental Technology Limited (UK)

#### 2<sup>nd</sup> International Conference on Sustainable Remediation 2012

Dietmar Müller, Environment Agency Austria

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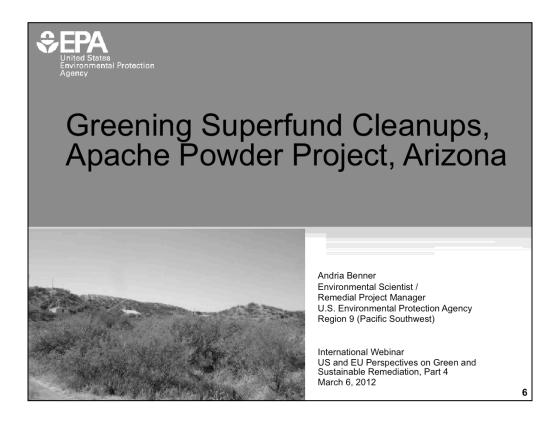
# History: US and EU Perspectives on Green and Sustainable Remediation\*

- 2008 ConSoil: Opening the dialogue on technical and policy fronts
- 2009 Copenhagen: First International Forum on the specific topic of green remediation
- 2010 ConSoil: First comprehensive summary of International Developments in Sustainable and Green Remediation
- Internet Webinars on US and EU Perspectives on Green and Sustainable Remediation
  - > 1: July 12, 2010: Groundwork for ConSoil 2010
  - ➤ 2: March 15, 2011: Comparing and contrasting perspectives on GSR
  - > 3: October 26, 2011: Case studies, part 1

> 4: March 6, 2012: Case studies, part 2

\*Cluin.org/global

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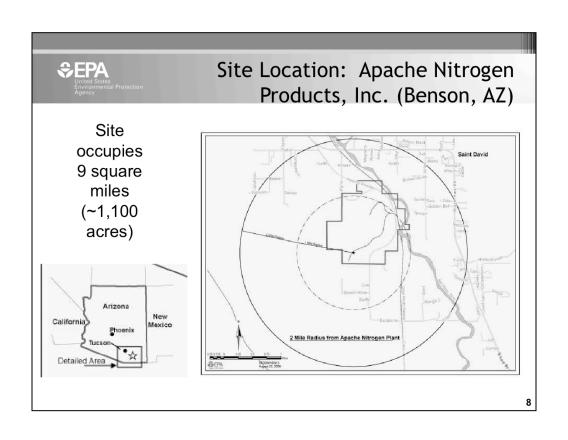


US and EU Perspectives on Green and Sustainable Remediation



# Apache Powder Presentation Overview

- I Site Overview History and "Green" Remedies
- II Renewable Energy (RE) Evaluation Process
- III Moving Towards a Solar Future
- IV Lessons Learned





# **Background and Site History**

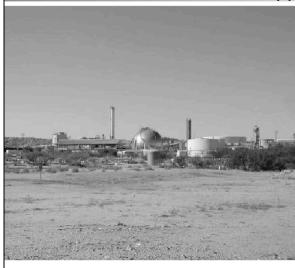


- Apache Powder Company began explosives manufacturing operations in 1922.
- Manufactured dynamite for mines & nitrogen fertilizers for local agriculture; currently still manufacturing ammonium nitrate.
- Groundwater and soils contamination resulted from prior disposal practices. Listed on EPA's Superfund list of contaminated sites in 1990.





# Soils Remedy: Closed and Capped Infiltration Ponds



- Superfund "construction complete" in 2008 for soils and groundwater cleanup activities
- Apache Nitrogen
  Products, Inc. (ANPI), the
  former Apache Powder
  Company, continues to
  manufacture chemical
  products on the Site



# Groundwater Remedy: Wetlands & Monitored Natural Attenuation

- Constructed wetlands system treats nitratecontaminated groundwater (24/7 - 365/days year)
- Avoids chemical usage, energy consumption and waste generation associated with traditional treatment methods
- Solar power used to circulate water between the wetlands ponds







# Renewable Energy Analysis Process

- 1. Evaluate the renewable energy resource
- 2. Assess site suitability
- 3. Consider technology specific criteria
- 4. Review market and incentives



# Purpose of Pre-Feasibility Solar Assessment

To evaluate the suitability of solar energy generation as a reasonable future use at the Apache Powder Superfund site and identify key considerations for further evaluation









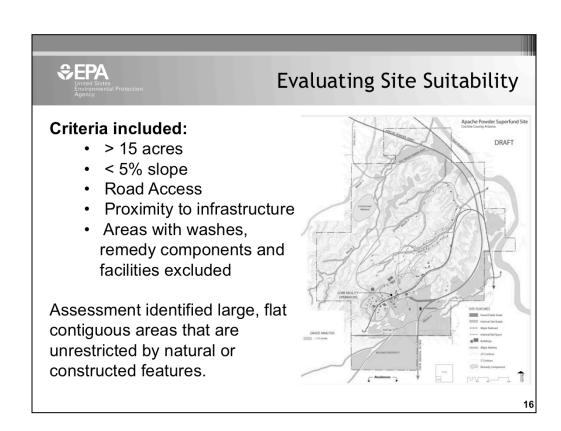
# **Apache Energy Context**

- On-site electricity use
  - 1-1.5 MW daily base use, 2 MW peak daily energy demand for operations
  - 2007 electrical consumption was ~14 million kilowatt hours (kWh)
  - Sulphur Springs Valley Electric Cooperative (SSVEC) is local electricity provider (utility)
- Transmission Capacity
  - Existing substation rated at 69 kV
  - Transmission lines to Apache property are 10 MW, line capacity to substation is 40 MW
  - Future (2011-2012) 69 kV line will have 100 MW capacity



# Apache Renewable Energy Evaluation

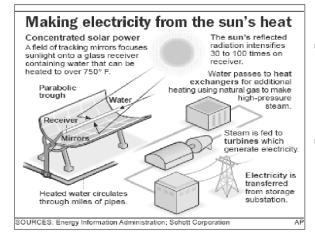
- Potential Solar Generation Scenarios for Site:
  - On-site Use:
    - Provide an on-site electricity source for all or a portion of facility's electricity use
    - Provide on-site steam to support manufacturing operations
  - Grid Use: Generate utility scale energy for the grid with potential revenue/financial benefits to Apache





# **Technology Overview**

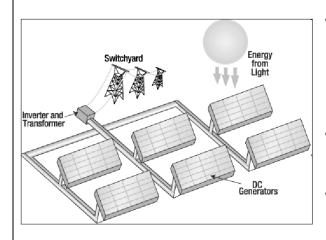
### **Concentrating Solar Power (CSP)**



- CSP plants indirectly generate electricity
- Mirrors
   concentrate solar
   energy into high
   temperature heat
   or steam that
   powers a turbine
  - Various solar thermal technologies at differing levels of commercial readiness



# **Technology Overview**



- Photovoltaic (PV)
  devices make use of
  highly purified silicon
  to convert sunlight
  directly into
  electricity
- PV can be expensive to operate on a kWh basis
- PV panel conversion efficiency typically between 10-20%

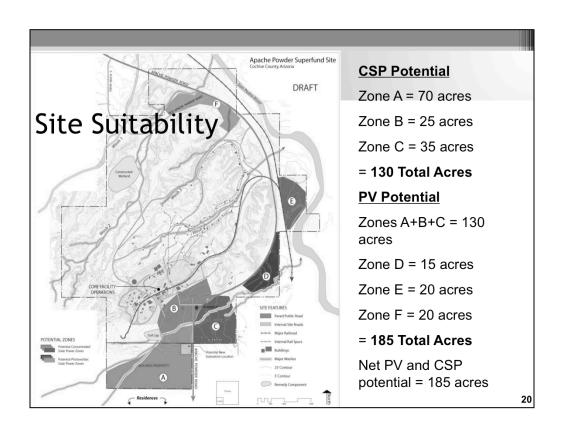


# Solar Technology Assessment

# Concentrating Solar Power (CSP) Versus Photovoltaic (PV)

Solar Technology Type	Acres per MW	Minimum Practical Acreage	Site Needs	Storage Capacity	Estimated* Annual Water Usage
CSP	3 – 8 acres / MW	40 - 50 acres	Large, contiguous, level area	Yes	Significant
PV	4 – 10 acres / MW	N/A	Flexible	No	Negligible

<sup>\*</sup>Estimates can vary based on specific technology





# Utility Scale PV: Installed Cost Estimates

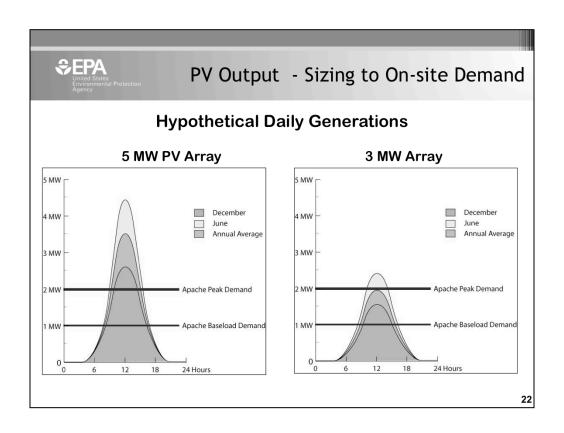
Solar Photovoltaic Technology Type	Acres per MW	Estimated Facility Size (MW)	Estimated Land Area Needed (acres)	Estimated Capital Cost (\$ 1000)	Estimated Annual O&M Cost (\$ 1000)
Thin Film (fixed axis)	6-8	5	30-40	\$25,000 - 30,000	\$400 – 600
Crystalline Silicon (fixed axis)	4-5	5	20-25	\$30,000 – 36,000	\$450 – 600
PV Tracking	8-10	5	40-50	\$35,000 — 40,000	\$900 – 1,100



Tracking PV panels follow the sun to allow for increased solar capture.



Fixed axis PV panels aligned to be south facing.





# **Summary of Site Opportunities**

Potential Benefits of Solar	Potential Limitations for Solar	
Solar could help reduce peak electricity demand from grid	<ul> <li>Not all on-site demand could be replaced due to intermittent electricity production</li> <li>Arid, southwest environment (water issues) and available acreage limits viability of a CSP</li> </ul>	
CSP could generate on-site steam		
<ul> <li>Solar could help hedge against conventional energy price volatility</li> </ul>		
Opportunity to generate and sell	facility at site	
Renewable Energy Credits (RECs) for additional income	<ul> <li>Natural gas used in manufacturing operations; solar would not impact</li> </ul>	
Public relations benefits by use of	natural gas use	
renewable energy at a Superfund site	<ul> <li>A solar project exceeding 5 MW would require substation and transmission line upgrades</li> </ul>	



# Market Opportunities & Incentives

### **Solar Incentives / Market Drivers**

- Federal Incentives
  - Business Energy Tax Credits (aka Investment Tax Credits (ITCs))
  - Clean Renewable Energy Bonds (CREBs)
- State Incentives
  - Renewable Portfolio Standards (RPS)
  - Commercial/Industrial Solar Energy Tax Credit Program
- Utility Incentives
  - Up front incentives (Rebates)
  - Performance-based incentives
  - Feed-in Tariffs (FITs)



# Plans Toward a Solar Future

- Pursuing utility-scale project
- Several small-scale solar applications in place:
  - Flow measurement at the wetland
  - Lighting, motion detector, security camera and gate control
  - Pump for contaminated perched water extraction







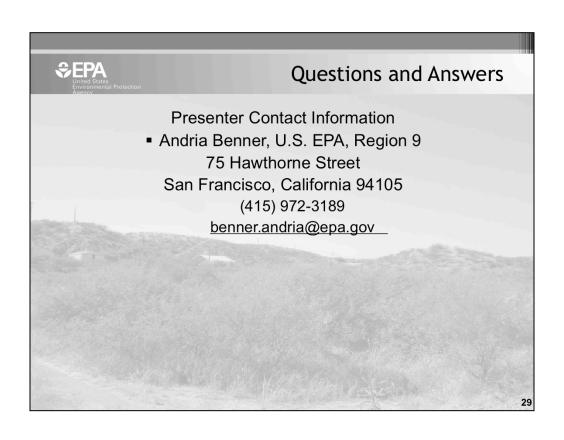
# Lessons Learned - Apache

- Solar energy development is compatible with Site and Superfund remedy
- Site has potential for direct use and utility-scale solar (PV preferred)
- High upfront capital costs for both CSP and PV (5 MW - minimum \$25M for PV and \$35M for CSP)
- Ability to utilize incentives and obtain a long term Power Purchase Agreement (PPA) critical for the economic viability of a utility scale project



# Lessons Learned - General

- Public-Private Partnerships can effectively support renewable energy projects
- Establishing and Maintaining Relationships (Agencies/Utilities) is critical
- Superfund remedial process can provide information to fulfill permitting and other regulatory requirements
- Utility-scale renewable energy projects are complex, but manageable





# d eko nta TRIANGLE Zatec – regional sustainable development

# Site description

### **History:**

- former military airport, operating before World War II until 1992
- approx. 350 hectares

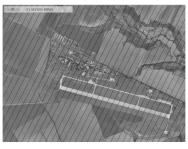
#### **Contamination:**

- jet fuels, light fuel oil, engine and hydraulic oils
- unsaturated zone: ~ 10 hectares (TPH max. 7.000 mg/kg)
- saturated zone: ~ 30 hectares

### Geological profile:







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# dekonta

#### TRIANGLE Zatec - regional sustainable development

# Site-remediation activities realized in a framework of development the largest industrial zone in Central Europe - TRIANGLE Zatec

#### **Target limits for site remediation:**

- unsaturated zone: 2,000 mg/kg TPH (Total petroleum hydrocarbons)
- groundwater: removal of oil phase from groundwater table
  - 4 mg/l dissolved TPH

#### Applied remedial techniques:

- bioremediation ,on-site' (184,000 tons of contaminated soil)
- bioremediation ,in-situ' (157,000 tons of contaminated soil)
- P & T of contaminated groundwater (area of 300,000 m²)
- monitoring of remediation process

### Participating subjects:

- investor: Usti Region (regional authority)
- general contractor: **DEKONTA**, a.s.
- supervisor: AQUATEST, a.s.
- guarantee: CZECHINVEST (Czech Investment and Development Agency)



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#### TRIANGLE Zatec - regional sustainable development

### Main project activities - scheduling

### 2003

- elaboration of project implementation documents and permitting
- site investigation (drilling works), setting out of contaminated places
- preparatory work (decontaminated plate)

#### 2004

- clean-up bioremediation ,on-site'
- construction works (demolition, soil excavation, backfilling)
- sampling of groundwater and soil
- laboratory works (monitoring biodegradation process, model laboratory tests) incl. evaluation of laboratory analysis results

#### 2005 - 2008

- clean-up works biodegradation ,in-situ' (till 2006)
- GW treatment, operation of a hydraulic barrier (till 2008)
- sampling, laboratory works (postremedial monitoring till 2013)

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#### TRIANGLE Zatec - regional sustainable development

### Bioremediation ,on-site' (1)

#### soil cultivation

 in order to ensure aeration, equal application of biopreparation, additives and homogenisation of materials

#### application of bacterial preparation

■ Time: 4 - 8 months

 according to the contamination level, soil characteristics and climatic conditions

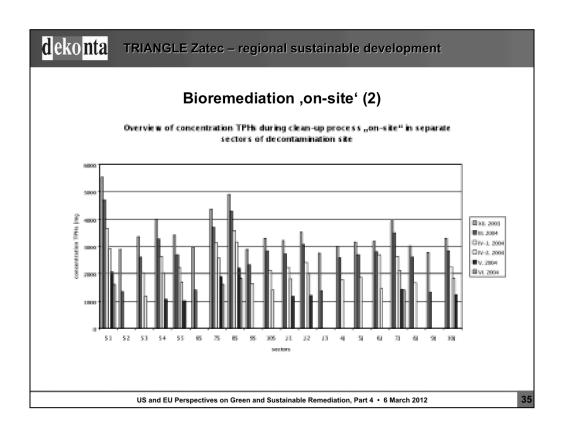
■ Backfilling: 184.000 tons

 Decontaminated material was continuously placed back to excavated places as backfilling after achievement of TPHs target limit (control sampling by a supervisor)

■ Contaminant mass: 411 tons



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#### TRIANGLE Zatec – regional sustainable development

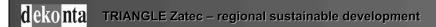
#### Bioremediation ,in-situ'

- up-grade of a biotechnological equipment (storage tanks, pumps, compressors), set up for permanent operation
- installation of electric cables, pipelines for distribution of water and solutions (-bio, -mineral), drainage layers and infiltration systems at bottom of pits
- installation of equipment for treatment of groundwater
- capacity of the biocenter was 60 m³ of biopreparation per day and 35 m³ of mineral additives per week
- system was completed by wells for injecting of air (bioventing)
- stage of clean-up process bioremediation ,in-situ' started in September 2004 and was operated for 22 months (until June 2006)
- soil and groundwater monitoring was realized during .in-situ' bioremediation





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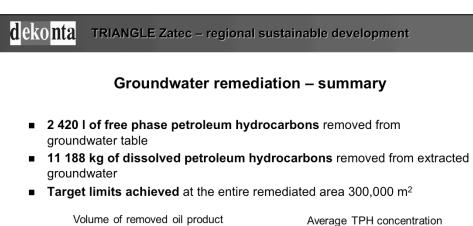


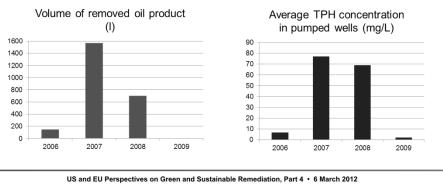
#### Clean-up of saturated zone (groundwater treatment)

- operation of the outside hydraulic barrier (30 wells) includes groundwater quality monitoring
- total area of contaminated groundwater: more than 300,000 m²
- average volume of groundwater extracted daily: 302 m³ (3.5 l/s)
- entire volume of extracted and treated groundwater: 173 998 m³
- **3 water treatment stations** equipped with a gravitation separator and an adsorption filter with fibroil
- TPH concentration infiltrated back: approx. 0.01 mg/l



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#### TRIANGLE Zatec - regional sustainable development

## **Environmental benefits (1)**

→ no formal sustainability assessment, neither during the design phase nor during the implementation

#### **REFERENCE SCENARIO** (TPH-contamination)

- bioremediation ,off-site' (Czech Republic: ~ 90 %)
  - transport distance: 100 km

#### CHANGED PRACTICES (Qualitative characterisation)

#### Treatment on-site and in-situ

- reduced energy
- reduced CO2-emissions
- reduced dust and noise disturbance
- lowered risk of accidental release of contamination

#### Closed cycles (reuse/recycling treated soil & groundwater)

- minimization of water consumption
- minimization of waste production

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dekonta TRIANGLE Zatec – regional sustainable development

## **Environmental benefits (2)**

#### Semiquantitative accounting for transports

(Reference scenario: Off-site biological treatment, distance 100 km)

#### energy savings:

■ On-Site: approx. 150.000 I fuels, (~ 5 Mio. kWh) On-Site & In-Situ: 275.000 I fuels (~ 9 Mio. kWh)

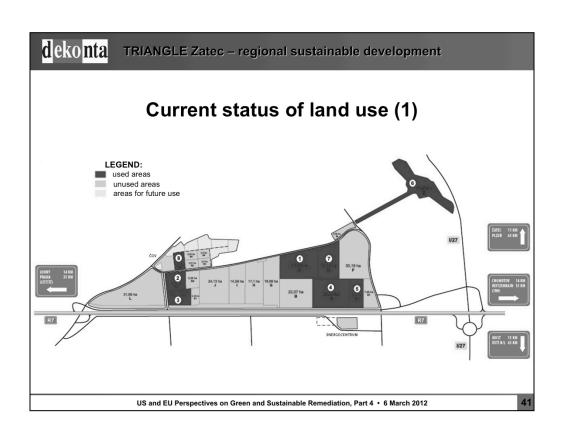
#### CO2-savings:

■On-Site treatment: 385 t ■On-Site & In-Situ: 720 t

#### Further benefits:

→Cost savings: 10 – 15 % →Time savings: 3 – 4 years

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# $\frac{d\,eko\,nta}{}\,\,\,\,\text{TRIANGLE Zatec}\,-\,\text{regional sustainable development}$

# **Current status of land use (2)**

#### Investors in the industrial zone - Triangle Zatec:

- ■Panasonic Liquid Crystal Display Czech s.r.o. (JPN)
- ■Solar Turbines EAME s.r.o. (USA)
- ■JC Interiors Czechia s.r.o. (USA)
- ■Gestamp Louny s.r.o. (ESP)
- ■Hitachi Automotive Systems Czech s.r.o. (JPN)
- ■FVE Triangle a.s. (CZE)
- ■Panattoni Czech Republic Development s.r.o. (USA)
- ■HARGO a.s. (CZE)











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TRIANGLE Zatec – regional sustainable development

### Socio-economic aspects

#### reuse of the site:

- first investments starting 2006
- until 2009: > 2.000 new jobs

#### Regional impacts (SWOT-analysis 2008):

- development of business and foreign trade
- decrease of high unemployment rate
- enhancement of low education
- development of associated infrastructure and services
- expected GDP increase at the range from min. 2.8 % to max. 11.7 %
- fiscal contributions on VAT, health insurance

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TRIANGLE Zatec - regional sustainable development

#### **SUMMARY**

- clean-up design is the driver of environmental impacts in remediation
- on-site and in-situ approaches and working in closed cycles (reuse) bring many benefits like reduction in energy consumption, emissions, risk levels, costs
- to design projects in a more sustainable manner, it would be crucial to develop practicable and commonly accepted assessment tools (e.g. MCA, LCA)
- future European policies should aim to reduce preferences ex-situ & off-site solutions
- transforming a site means "creating value": Socioeconomic aspects and embedding projects locally or regionally is fundamental

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### How it got started

- Federal funding guidelines for Remediation: "Maximal ecological effect under acceptable cost"
- Obligatory for funding: Ecological-economic assessment of remediation alternatives; criteria and assessment-tools have not been standardised until now
- Project "Ecological-economic assessment of remediation measures" 2010 → Recommendation: Modified Cost-Effectiveness-Analysis (MCEA) as standardised assessment-tool
- Project "Modified Cost-Effectiveness-Analysis (MCEA) for Remediation" 2011

Client: Federal Ministry of Environment

Contractors: Environment Agency Austria, Kommunalkredit Public

Consulting GmbH, denkstatt GmbH

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# **Reasons for choosing MCEA**

- © Established, commonly used, simple, flexible (CEA = basis for many different applications)
- © Similar approaches have already been applied in studies on remedial alternatives (in Austria)
- © Clear definition of priorities → hierarchy of goals (criteria)
  - (Private) costs as separate parameter (contrary to MCA)
  - High transparency!

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#### Austria's new MCEA-Tool



ENVIRONMENT **umwelt**bundesamt

# Principles of (M)CEA

- > Costs: Private costs of alternative
- ➤ Effectiveness: "Degree of achieving specific goals" → definition of goals (criteria)
- > Result of a (classical) CEA: Cost-Effectiveness-Matrix
- > Result of a MCEA: Effectiveness/Cost-Ratio

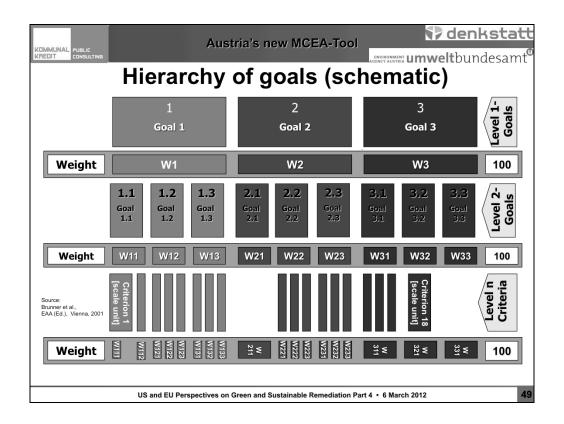
Alternatives	Costs	Effectiveness				
	Costs	Criterion 1	Criterion 2	Criterion 3		
1	C1	E11	E12	E13		
2	C2 (	E21	E22	E23		
3	C3	E31	E32	E33		

After IFIP (1999) and Hanusch (1986)

Further reading on MCEA – Theoretical background and application in waste management Döberl et al. (2002): Waste Management & Research, 20, 311-327.

VDI (The Association of German Engineers): Guideline on Assessment Tools (incl. MCEA): 2012?

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# Constructing a hierarchy of goals – main principles

- The goals of the uppermost level ("overall objectives") and their weighting should be derived from national laws, guidelines and other relevant international documents
- The goals of the lowermost level ("level of criteria") should be represented by criteria which should be measureable (quantitatively or qualitatively)
- The hierarchy of goals and its weighting should be defined in a consensus based discussion process including all stakeholders
- Upper-level goals and their weighting should be pre-defined by the public funder

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# Constructing a hierarchy of goals – considering sustainability

- Starting point: New Mission Statement on Contaminated Site Management in Austria released in 2009: Remediation measures shall be sustainable and increase the environmental status permanently.
- Clear statement on the implementation of sustainability into remediation of contaminated sites
- → Criteria reflecting or integrating the principles of sustainability are needed
- → A suitable assessment methodology is needed (MCEA)

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Constructing a hierarchy of goals – considering sustainability

- > Discussion process
  - > Several "inner-circle"-meetings (6-7 people)
  - 2 workshops with all relevant stakeholders (30 people; authorities, consulting, site owners, real estate development, spatial planning, science)
- Relevant documents Level-1-goals are derived from: Water Act, Mission Statement, Guidance on Funding, National goals on environmental quality, international documents, e.g. published by SURF UK
- Three Level-1-goals (main objectives): (1) Ecology, (2) local development, (3) project stability

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# "Goal 1" at Level 1: Ecology

Level 1	Weight	Level 2	Weight	Level 3	Weight
Ecology 6		Primary ecological effects (i.e. "goal of remediation")	40	Effect on source of pollution	20
				Effect on threatened subject (e.g. groundwater)	15
				Remediation period	5
	60	Secondary ecological effects	20	Other subjects of protection	4
				Climate protection	4
				Energy	4
				Waste	4
				Natural Resources	2
				Local ecosystem	2

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Level 4: Criteria



# "Goal 2" at Level 1: Local development

Level 1	Weight	Level 2	Weight	Level 3	Weight
				Public interests	7
		Site development	10	Private interests (property owner/ investor)	3
Local development	20	Increase in property value	5		5
		Decrease of new land consumption	5	Area	2
				Potential of decrease	3

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Level 4: Criteria



# "Goal 3" at Level 1: Project stability

	Level 1	Weight	Level 2	Weight	Level 3	Weight
			Local impacts	6	Impacts on neighbors	3
			Local impacts		Restrictions to infrastructure	3
	Project stability 20	Duration of permanent remediation measures	4		4	
		20	Safety and stability	10	Experience with remediation technology	2
					Incidents	2
					Workers safety	2
					Technical flexibility	2
					Economic and legal flexibility	2

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Level 4: Criteria





Considering sustainability – summary

- > 3 pillars of sustainability addressed
  - ➤ Environment → ecological criteria
  - ➤ Economy → site development, site value, stability
  - ➤ Society → impacts on regions, neighborhoods, workers; stakeholder involvement
- Priority of ecology compared to local development / project stability
- Priority of primary ecological effects compared to secondary ecological effects
- Increase in site value (one of the major driving forces for remediation) vs. public benefit?

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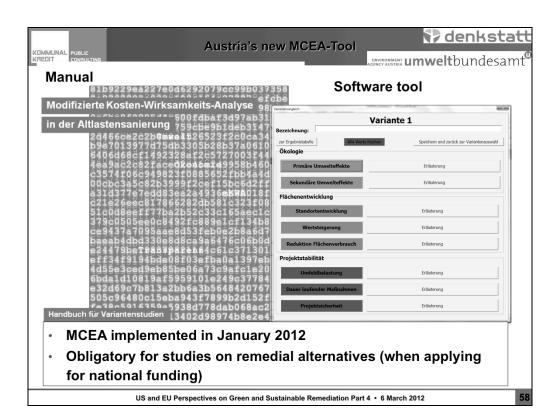
#### Austria's new MCEA-Tool

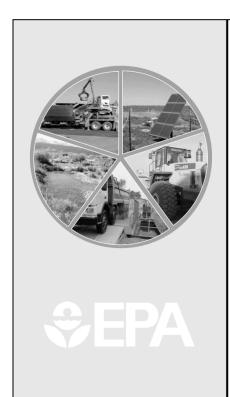


# Algorithms MCEA (main principle)

				Alternative A		Alternative B		Alternative C	
Level 1	Weight	Level 2	Weight	Effectiveness 0-10	Effectiveness x Weight	Effectiveness 0-10	Effectiveness x Weight	Effectiveness 0-10	Effectiveness x Weight
		G11	25	3	75	4	100	8	200
Goal 1	50	G12	15	6	90	7	105	10	150
		G13	10	9	90	0	0	5	50
	30	G21	15	1	15	1	15	7	105
Goal 2		G22	10	0	0	10	100	10	100
		G23	5	7	35	7	35	3	15
Goal 3	20	G31	10	5	50	8	80	6	60
		G32	6	4	24	3	18	9	54
		G33	4	4	16	6	24	4	16
Total	100		100	Total- effectiveness	395		477		750
		Cost	Mio.		19,2		9,5		13,3
Effe	ectiveness/0	Cost-Ratio	E/C		20,6		50,2		56,4
			Rank		3		2		1

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# **EPA Greener Cleanup Developments:**

(1) EPA Methodology for Understanding & Reducing a Project's Environmental Footprint

# (2) ASTM Standard Practice for Greener Cleanup

Carlos Pachon,

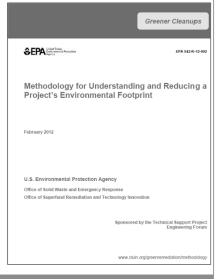
US EPA Office of Superfund Remediation and Technology Innovation (OSRTI),

US and EU Perspectives on Green and Sustainable Remediation, Part 4 March 6, 2012 Cluin.org/global

# Methodology for Understanding & Reducing a Project's Environmental Footprint

- Built around five core elements of a greener cleanup, as identified in OSWER's "Principles for Greener Cleanups"\*
- Remedy selection process remains the same in all cleanup programs
- Footprints are not required, but if conducted this is the preferred approach

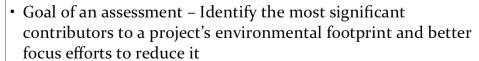
\*http://www.epa.gov/oswer/greenercleanups



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# Methodology for Understanding & Reducing a Project's Environmental Footprint (2)

- Provides common footprint metrics and a process to quantify them
- Designed to be compatible with existing "footprinting" tools
- Based on lessons learned from multiple projects



 Includes common conversion factors, contents of materials frequently used for cleanup, and typical energy demands of equipment deployed in the field

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Energy

Water

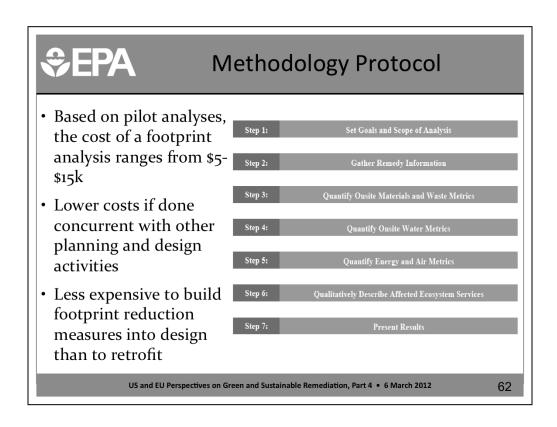
Air &

Atmosphere

& Waste

Land &

Ecosystems





# Methodology Applicability

#### Does the methodology call for life-cycle assessment (LCA)?

- It calculates the green remediation metrics but does not apply an "impact assessment" as typically needed in a full LCA
- Materials and waste target the on-site use and generation rather than off-site (boundary difference)
- · Energy, emissions, and water have fairly broad system boundaries

#### Does the methodology consider social and economic factors?

- The methodology focuses on the environmental footprint
- Social and economic factors are addressed in EPA cleanup programs through existing processes such as community involvement requirements and EPA's Superfund Redevelopment Initiative

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<b>\$EPA</b>	Green Remediation Metrics
Energy	<ul><li>Total energy used</li><li>Total energy voluntarily derived from renewable resources</li></ul>
Air	<ul> <li>Greenhouse gases</li> <li>Criteria pollutants (NOx, SOx, PM)</li> <li>➤ On-site emissions</li> <li>➤ Total emissions</li> <li>Hazardous air pollutants (HAPs)</li> <li>➤ On-site emissions</li> <li>➤ Total emissions</li> </ul>
Water	<ul> <li>On-site water use (including public/potable water)</li> <li>Quantity</li> <li>Source of water</li> <li>Fate of used and treated water</li> </ul>
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# **Green Remediation Metrics**

#### **Materials & Waste**

- Refined (including manufactured) materials used on-site
  - ➤ Quantity and % from recycled materials
- Bulk, unrefined materials used on-site
  - Quantity and % from recycled materials
- Waste
  - ➤ Hazardous waste generated on-site
  - ➤ Non-hazardous waste generated on-site
  - % of total potential waste generated onsite that is recycled or reused

Land & Ecosystems

• Currently qualitative evaluation

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# **Methodology Applicability**

#### Where and when is the methodology used?

- The methodology process and results are of value . . .
  - > For all types of cleanup projects
  - > For all cleanup programs
  - > Throughout the various phases of a cleanup project

#### How will EPA use the methodology?

- Train EPA technical staff on ways to understand and reduce the footprint
- Conduct footprint analyses at its own sites when and where appropriate
- Standardize Environmental Footprint Analyses
- Facilitate the evaluation of Environmental Footprint submitted to EPA by outside parties

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# Join us for a Webinar on the Environmental Footprint Evaluation Methodology

April 18, 2012

http://cluin.org/greenremediation

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# ASTM Standard Practice for Greener Cleanup (Draft)

- Initiated in 2008 with cross-sector workgroup participating in the development
- Focuses on evaluating and implementing activities to reduce the environmental footprint of a cleanup project
- Provides a process to identify and implement approaches to reduce the environmental footprint of a cleanup through;
  - Best Management practices; and
  - Quantitative evaluation

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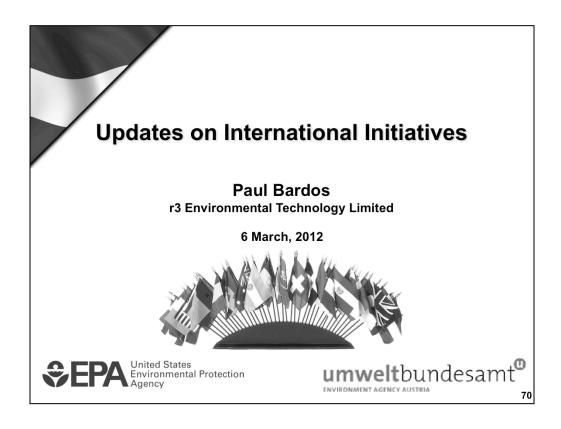
# **SEPA**

# ASTM Standard Practice for Greener Cleanup (Draft)

- A voluntary standard practice that includes a robust documentation process
- Currently in draft form and in "Balloting", with final anticipated in approximately one year
- For more information:

http://www.astm.org/WorkItems/WK23495.htm
or Contact John Simon at <u>Jsimon@gnarusllc.com</u> (Task
Group Leader)

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### **Common Forum on Contaminated Land in Europe**

- Risk-informed & sustainable land management (11th ICCL-meeting, Washington, D.C; 4.10.2011)
  - Aims at developing a position paper to transform and complement RBLM towards a 4th generation policy concept

## **NEXT STEPS:**

- »Non-paper»:
  - First Draft (April 2011)
  - 2 feedback & discussion loops (until September 2012)
  - Revision, presentation & discussion (November 2012)
- Joint Paper with NICOLE and possibly other networks

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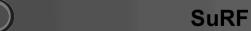


## **NICOLE**

# Nicole Sustainable Remediation Working Group – Activities 2012

- Background work to the road map to be published in March 2012 (series of standalone research chapters)
- Looking for examples of projects where sustainable remediation has been documented, or NICOLE roadmap has been applied
- Looking into a possibility of a joint statement with the Common Forum and other European networks working in the area
- · Preparing a summary paper of work to date
- · Supporting the conference organised by Eurodemo
- Organising committee Olivier Maurer, Lucy Wiltshire, Sarah MacKay

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## **SUstainable Remediation Forum**

- New Technical Initiatives:
  - Sustainable Remediation and Redevelopment
  - Sustainable Remediation Site Rating
  - Site of Sites
- Recent Meetings: SURF 19, Univ. Calif. San Diego
- Upcoming Meetings:
  - SURF 20, Colorado State University, Fort Collins, CO
  - SURF 21, National Academy of Sciences, Washington D.C.
- · Two New Student Chapters with 2 more underway

www.sustainableremediation.org

Follow us on LinkedIn and Twitter @SR\_Forum

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## **SuRF ANZ**

## **SuRF ANZ (nee Australia)**

- · Large interest indicated by the industry
- Steering Committee continues to meet. Chair is Garry Smith of AECOM
- · Agreed to change name to SuRF ANZ to include New Zealand
- · SuRF ANZ website is www.surfanz.com.au
- Admin support by Australian Land and Groundwater Association
- · Various presentations have been made at conferences
- Input to the development of a National Remediation Framework by CRC CARE
- A set of workshops around Australia and New Zealand have been held on Green and Sustainable Remediation
- SuRF ANZ meeting will be held at Ecoforum, 8 March, Sydney. This
  meeting will confirm a work plan for the coming year, and will set up
  working groups
- Our thinking on sustainable remediation continues to develop!

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## **SURF-NL**

- Participants: (>30!) Ministry I&E, R&D institutes (Deltares, RIVM), consultancies, contractors, authorities (municipalities and provinces), Shell, Port of R'dam, Dutch Railways etc.
- **Not only Remediation**; Sustainable management of soil and groundwater Quality (future: also soil protection)
- Goal SURF-NL: transition in the soil sector to a transparent and integral way of working based on sustainability principles and integration with spatial planning
- Position Paper ready and launched during National Soil Conference end November 2011
- "Business plan 2012" workshops, hands-on!, SURF-NL as
  discussion platform with policy makers and industry on
  developments new Environment Law NL (2015 onwards,
  integration of Soil Protection Act in overarching Environment Law)

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7:



### SuRF-UK

SuRF-UK published the Annex 1: SuRF-UK Indicator Set for Sustainable Remediation (SR) in Nov 2011. <a href="https://www.claire.co.uk/surf-uk">www.claire.co.uk/surf-uk</a> It is hoped that Phase 3 will start in April 2012 to:

- · develop and publish illustrative case studies;
- develop guidance on generic 'best management practices' that can be applied to remediation projects to encourage use of more sustainable approaches;
- develop guidance for assessors on good practice for qualitative sustainability appraisals;
- provide a 1-hour long webinar on tiered SR appraisal (with an emphasis on Tier 1 = initial qualitative weekend)

All work will be developed with industry through a series of workshops and open consultation.

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# The 2<sup>nd</sup> International Conference on Sustainable Remediation 2012

November 14 – 16, 2012 in Vienna, Austria www.sustainableremediation2012.org

> Dietmar Müller Environment Agency Austria (EAA)







"

### **CONFERENCE THEMES**

- Policy, Conceptual Framework and Societal
  - **Values**
- Metrics and indicators
- Practical Tools
- "Greening" Remediation
- Opportunities from Synergy
- The 2<sup>rd</sup> International Conference on Superior State 2 of International Conference on Sussainable Remediation 2012

  THE DATE SUSSAINABLE REMEDIATION 2012

  SMACINS

  District State S
- Policy, Conceptual Framework and Societal Values visions on how to integrate sustainability and moving towards a better understanding of benefits
- Metrics and indicators identification and application of metrics / indicat characterise green, eco-efficient or sustainable approaches
   Resetting Yeals
- "Greening" Remediation how to minimize the environmental footprint of remediation works
- remediation works

  Opportunities from Sywergy land recycling, renewables, integrating at
- regional scales, optimizing "werking with nature", combined benefit approaches (e.g. heat storage and groundwater remediation)

  Case-studies and eco-efficient technologies – towards increased costeffectiveness and environmental improvement



Case-studies and eco-efficient technologies

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### PROGRAMME OVERVIEW

## Wednesday, 14 November 2012 (afternoon)

- •Conference Opening, Plenary Session
- •Welcome Reception

## Thursday, 15 November 2012

- •Technical and Scientific Sessions
- •Thematic and Project Workshops
- Conference Dinner

## Friday, 16 November 2012

- •Plenary Session, Poster Session
- •Roundtable Discussion and Summary

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#### **KEY DATES**

- 27<sup>th</sup> April 2012: Deadline for abstract submission, proposals on thematic or project workshops
- 4<sup>th</sup> June 2012: 2<sup>nd</sup> Announcement and Provisional Program
- 31st August 2012: Final announcement and Program
- 19<sup>th</sup> September 2012: Green and Sustainable Remediation Internet Seminar
- 3<sup>rd</sup> October 2012: End of registration
- 14 16 November 2012

**Sustainable Remediation Conference** 

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### **CREATING A MEETING PLACE**

#### **PARTNER ORGANISATIONS:**

- •Common Forum on Contaminated Land in the European Union
- •NICOLE (Network on Industrially Contaminated Land)
- •US EPA (Office of Superfund Remediation and Technology Innovation)
- EURODEMOplus
- •CL:AIRE (Contaminated Land: Applications in Real Environments)
- •Chinese Academy of Sciences (Institute of Soil Science)

#### **FURTHER PARTNERS (tbc)**

•RELASC (Latin America), CRC Care (Australia)

#### **REGIONAL ORGANISERS**

•EAA (Environment Agency Austria)







•BOKU (University of Natural Resources and Life Sciences, Austria)

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# **Resources & Feedback**

- To view a complete list of resources for this seminar, please visit the <u>Additional Resources</u>
- Please complete the <u>Feedback Form</u> to help ensure events like this are offered in the future

