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Region 5 Greener Cleanups Workshop
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# GREENER CLEANUPS IN ILLINOIS

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# GREENER CLEANUPS IN ILLINOIS

- The Matrix
- 5 Guiding Principles
- Strategy Mind Maps and Decision Trees
- Illinois EPA RCRA Pilot Study with USEPA Region 9
- Active in Task Group developing ASTM Standard Guide for Green and Sustainable Site Assessment and Cleanup

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# Greener Cleanups

Greener Cleanups are less polluting, more efficient cleanup activities and technologies designed to increase the environmental benefits of remediation. By performing greener cleanups, you can:

- Reduce carbon emissions and other greenhouse gases,
- Conserve natural resources,
- Improve energy efficiencies (and decrease costs), and
- Reduce waste material requiring off-site disposal.

Illinois EPA has developed a series of tools to help site owners, developers and their consultants in incorporating greener cleanup practices. This effort applies to every cleanup program in the Bureau of Land, though specific tools have been created for LUST sites.

## Five Guiding Principles for Greener Cleanups in Illinois

1. Ensure every cleanup protects human health and the environment.
2. Integrate site reuse plans into the cleanup strategy.
   a. Sequence work to improve efficiency.
   b. Make use of engineered barriers and institutional controls that are compatible with future site development.
3. Conserve raw materials such as soil and water; salvage building materials and other resources.
   a. Reduce waste disposal.
   b. Reduce the need for new materials, including clean fill and potable water.
   c. Use existing infrastructure.
4. Conserve energy.
   a. Reduce energy consumption.
   b. Use renewable energy sources to power cleanup activities where possible.
5. Consider the environmental effects of treatment technologies when choosing a site remedy.

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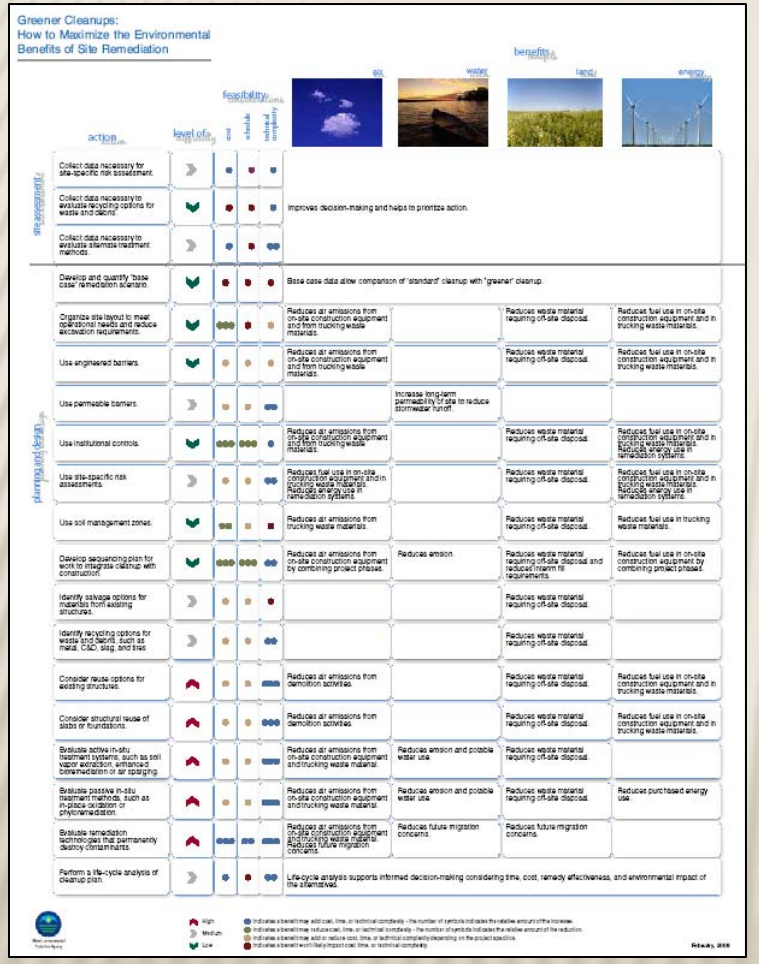
# THE MATRIX


Greener Cleanups:
How to Maximize the Environmental
Benefits of Site Remediation
benefits
air
water
land
energy
feasibility
action
level of effort
cost
schedule
technical complexity
site assessment
Collect data necessary for site-specific risk assessment.
Collect data necessary to evaluate recycling options for waste and debris.
Collect data necessary to evaluate alternate treatment methods.
Improves decision-making and helps to prioritize action.
planning and design
Develop and quantify "base case" remediation scenario.
Base case data allow comparison of "standard" cleanup with "greener" cleanup.
Organize site layout to meet operational needs and reduce excavation requirements.
Reduces air emissions from on-site construction equipment and from trucking waste materials.
Reduces waste material requiring off-site disposal.
Reduces fuel use in on-site construction equipment and in trucking waste materials.
Use engineered barriers.
Reduces air emissions from on-site construction equipment and from trucking waste materials.
Reduces waste material requiring off-site disposal.
Reduces fuel use in on-site construction equipment and in trucking waste materials.
Use permeable barriers.
Increase long-term permeability of site to reduce stormwater runoff.
Use institutional controls.
Reduces air emissions from on-site construction equipment and from trucking waste materials.
Reduces waste material requiring off-site disposal.
Reduces fuel use in on-site construction equipment and in trucking waste materials. Reduces energy use in remediation systems.
Use site-specific risk assessments.
Reduces fuel use in on-site construction equipment and in trucking waste materials. Reduces energy use in remediation systems.
Use soil management zones.
Reduces air emissions from trucking waste materials.
Reduces waste material requiring off-site disposal.
Reduces fuel use in trucking waste materials.
Develop sequencing plan for work to integrate cleanup with construction.
Reduces air emissions from on-site construction equipment by combining project phases.
Reduces erosion.
Reduces waste material requiring off-site disposal and reduced interim fill requirements.
Reduces fuel use in on-site construction equipment by combining project phases.
Identify salvage options for materials from existing structures.
Reduces waste material requiring off-site disposal.
Identify recycling options for waste and debris, such as metal, C&D, slag, and tires
Reduces waste material requiring off-site disposal.
Consider reuse options for existing structures.
Reduces air emissions from demolition activities.
Reduces waste material requiring off-site disposal.
Reduces fuel use in on-site construction equipment and in trucking waste materials.
Consider structural reuse of slabs or foundations.
Reduces air emissions from demolition activities.
Reduces waste material requiring off-site disposal.
Reduces fuel use in on-site construction equipment and in trucking waste materials.
Evaluate active in-situ treatment systems, such as soil vapor extraction, enhanced bioremediation or air sparging.
Reduces air emissions from on-site construction equipment and trucking waste material.
Reduces erosion and potable water use.
Reduces waste material requiring off-site disposal.
Evaluate passive in-situ treatment methods, such as in-place oxidation or phytoremediation.
Reduces air emissions from on-site construction equipment and trucking waste material.
Reduces erosion and potable water use.
Reduces waste material requiring off-site disposal.
Reduces purchased energy use.
Evaluate remediation technologies that permanently destroy contaminants.
Reduces air emissions from on-site construction equipment and trucking waste material. Reduces future migration concerns.
Reduces future migration concerns.
Reduces future migration concerns.
Perform a life-cycle analysis of cleanup plan.
Life-cycle analysis supports informed decision-making considering time, cost, remedy effectiveness, and environmental impact of the alternatives.
High
Medium
Low
Indicates a benefit may add cost, time, or technical complexity - the number of symbols indicates the relative amount of the increase.
Indicates a benefit may reduce cost, time, or technical complexity - the number of symbols indicates the relative amount of the reduction.
Indicates a benefit may add or reduce cost, time, or technical complexity depending on the project specifics.
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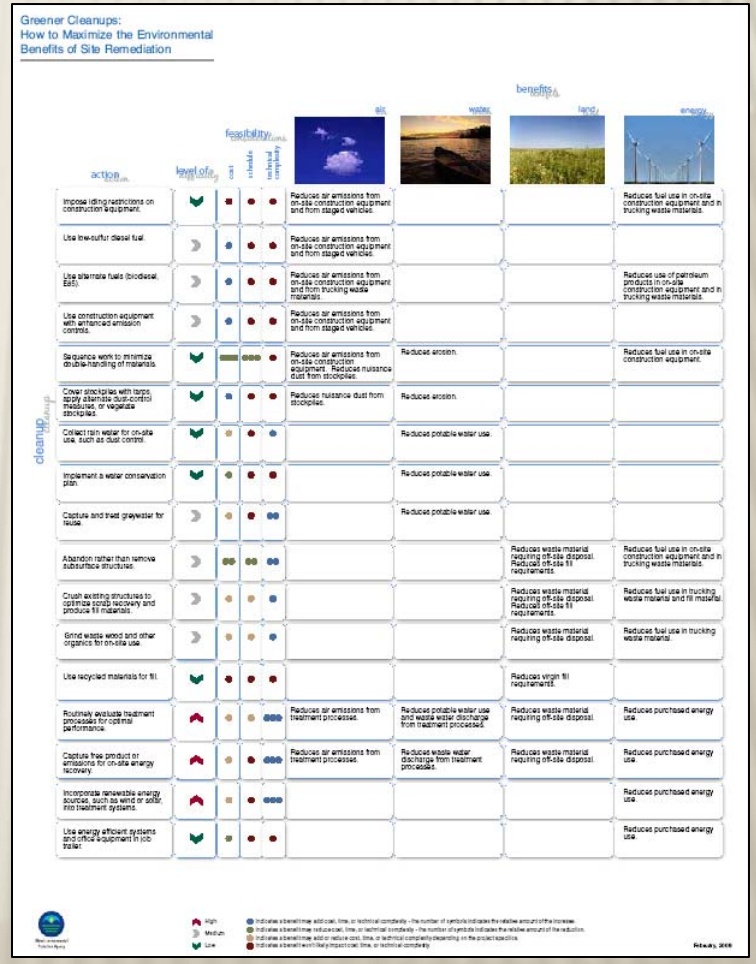
Rev. January 2009


Greener Cleanups:
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benefits
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cleanup
Impose idling restrictions on construction equipment.
Reduces air emissions from on-site construction equipment and from staged vehicles.
Reduces fuel use in on-site construction equipment and in trucking waste materials.
Use low-sulfur diesel fuel.
Reduces air emissions from on-site construction equipment and from staged vehicles.
Use alternate fuels (biodiesel, E85).
Reduces air emissions from on-site construction equipment and from trucking waste materials.
Reduces use of petroleum products in on-site construction equipment and in trucking waste materials.
Use construction equipment with enhanced emission controls.
Reduces air emissions from on-site construction equipment and from staged vehicles.
Sequence work to minimize double-handling of materials.
Reduces air emissions from on-site construction equipment. Reduces nuisance dust from stockpiles.
Reduces erosion.
Reduces fuel use in on-site construction equipment.
Cover stockpiles with tarps, apply alternate dust-control measures, or vegetate stockpiles.
Reduces nuisance dust from stockpiles.
Reduces erosion.
Collect rain water for on-site use, such as dust control.
Reduces potable water use.
Implement a water conservation plan.
Reduces potable water use.
Capture and treat greywater for reuse.
Reduces potable water use.
Abandon rather than remove subsurface structures.
Reduces waste material requiring off-site disposal. Reduced off-site fill requirements.
Reduces fuel use in on-site construction equipment and in trucking waste materials.
Crush existing structures to optimize scrap recovery and produce fill materials.
Reduces waste material requiring off-site disposal. Reduced off-site fill requirements.
Reduces fuel use in trucking waste materials and fill material.
Grind waste wood and other organics for on-site use.
Reduces waste material requiring off-site disposal.
Reduces fuel use in trucking waste materials.
Use recycled materials for fill.
Reduces virgin fill requirements.
Routinely evaluate treatment processes for optimal performance.
Reduces air emissions from treatment processes.
Reduces potable water use and waste water discharge from treatment processed.
Reduces waste material requiring off-site disposal.
Reduces purchased energy use.
Capture free product or emissions for on-site energy recovery.
Reduces air emissions from treatment processes.
Reduces waste water discharge from treatment processes.
Reduces waste material requiring off-site disposal.
Reduces purchased energy use.
Incorporate renewable energy sources, such as wind or solar, into treatment systems.
Reduces purchased energy use.
Use energy efficient systems and office equipment in job trailer.
Reduces purchased energy use.
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# 5 GUIDING PRINCIPLES IN ILLINOIS

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2. Integrate site reuse plans into the cleanup strategy.
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# 5 GUIDING PRINCIPLES IN ILLINOIS

5. Consider the environmental effects of treatment technologies when choosing a site remedy.
   a. Compare options for contaminant disposition (permanent destruction, pollutant transfer or management in place).
   b. Evaluate resource demands.
   c. Assess long-term stewardship responsibilities.

# CHALLENGES TO IMPLEMENTATION

- How do we apply big picture thinking to small sites?
- Can we overcome the perception that conventional practices are easier, faster, cheaper and more effective?
- Are we competing for attention with another emerging science? (vapor intrusion rulemaking underway in IL)
- How do we persuade site owners and consultants to incur learning curve costs when this is a voluntary initiative?
- What impact will this have on project manager workloads?

# FOR MORE INFORMATION

www.epa.state.il.us/land/greener-cleanups