

# **How Green is Dig and Haul?**

**David Morgan, Andrew Middleton and Laurie Winslow  
Corporate Environmental Solutions LLC**

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# Question

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- Which remedial alternative is “better” for the environment?
  - Big dig: Removal of all soil exceeding residential statewide health standards
  - Focused removal: Limited excavation of soil combined with engineering and institutional controls

# Answer

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- Both remedial alternatives can be designed to be protective of public health and the environment
- Thus, neither remedial alternative is “better” from this perspective
- The big dig remedial alternative can use significantly more resources than the focused removal alternative
  - Energy
  - Generation of greenhouse gases
- Is focused removal “greener” than the big dig?

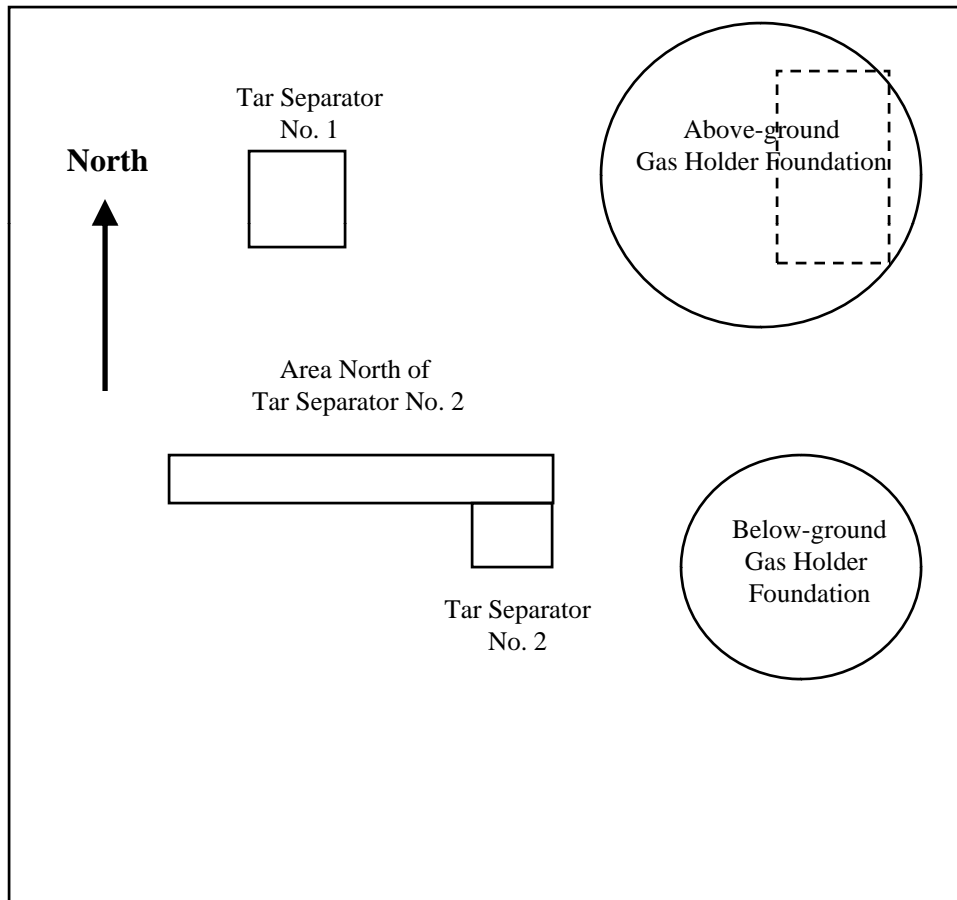
# Overview of Evaluation

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- Example site
- Remedial alternatives
- Results of conventional evaluation
- Results of evaluation of additional effects
- Institutional controls required
- Conclusions

# Example Site



Area: 0.7 acres  
Neighborhood: mix of industrial, commercial and residential uses

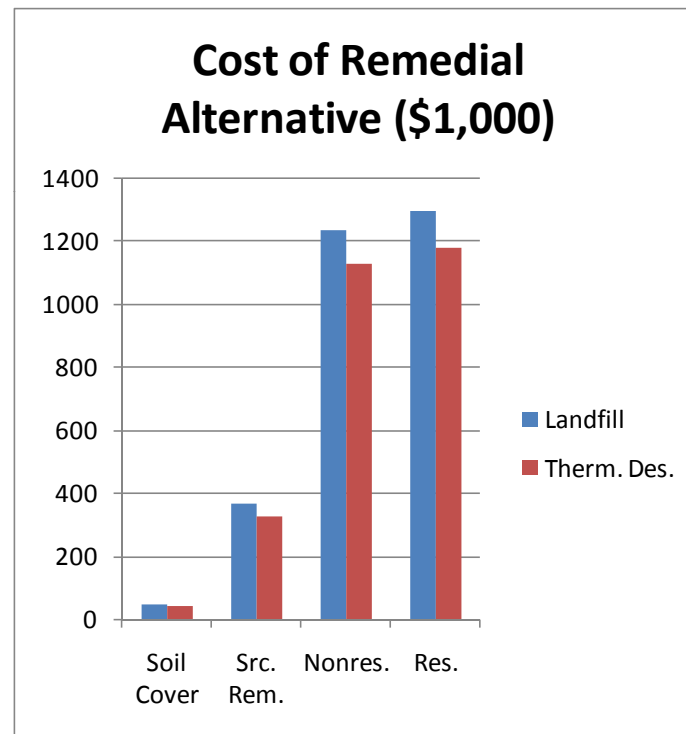
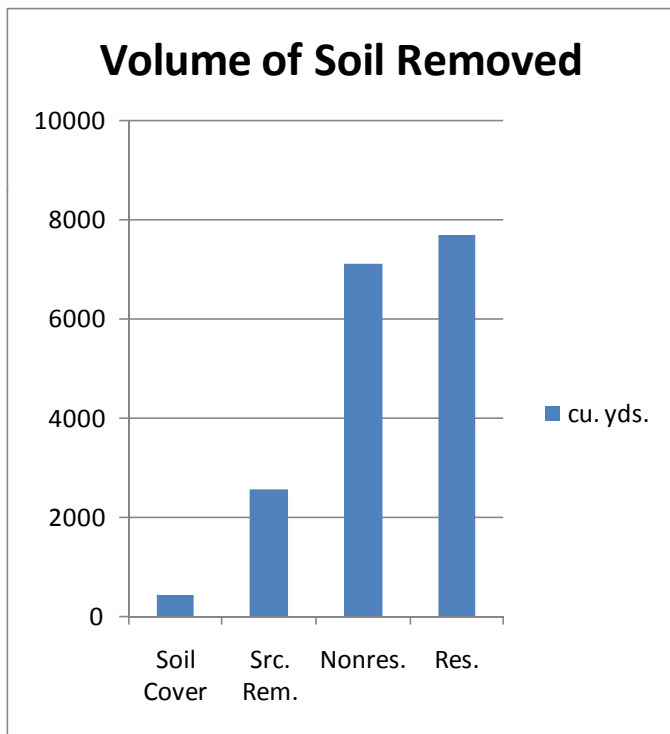
# Remedial Alternatives

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- RA1: Soil cover
- RA2: “Source” removal and soil cover
- RA3: Removal of soil exceeding nonresidential criteria
- RA4: Removal of soil exceeding residential criteria
- Soil disposal options:
  - Landfill
  - Thermal desorption

# Results of Conventional Evaluation of Remedial Alternatives



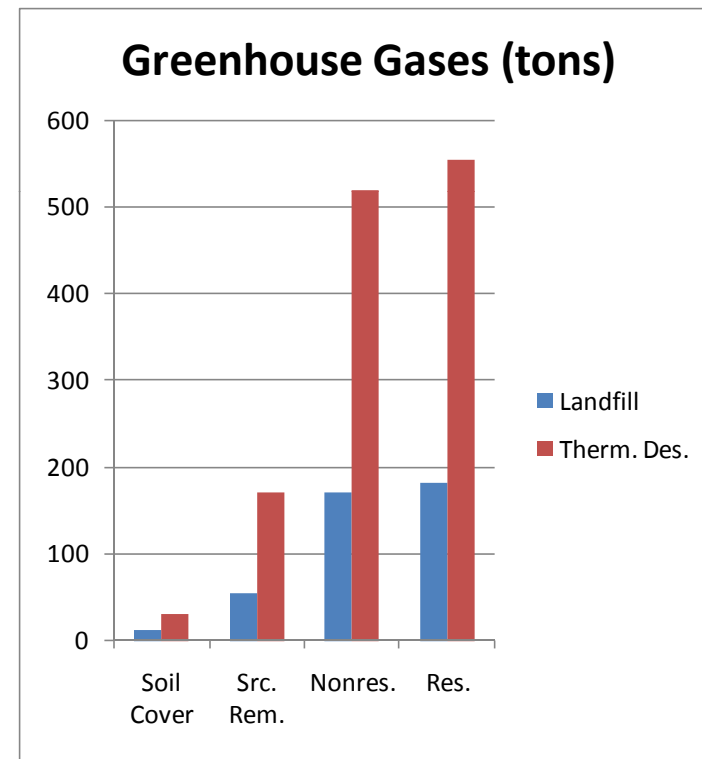
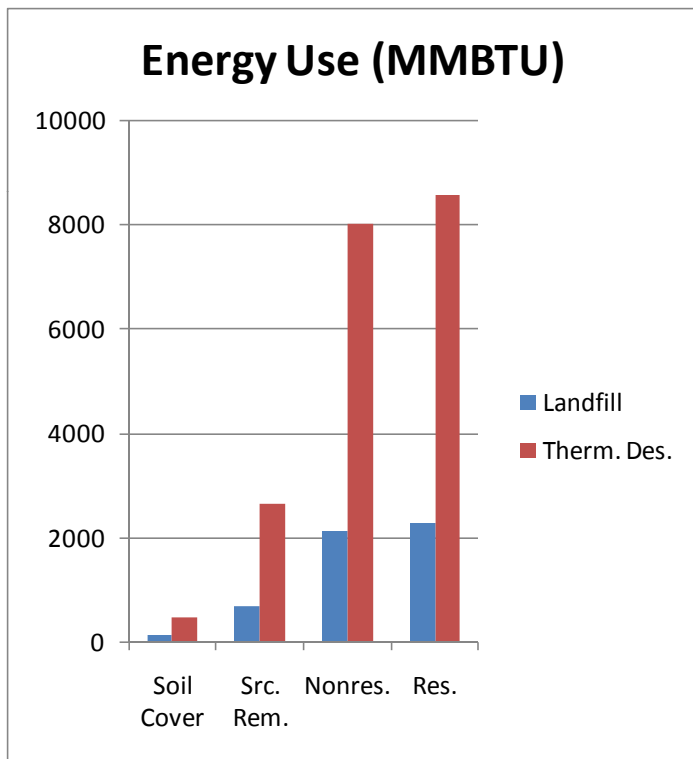
# Evaluation of Additional Effects

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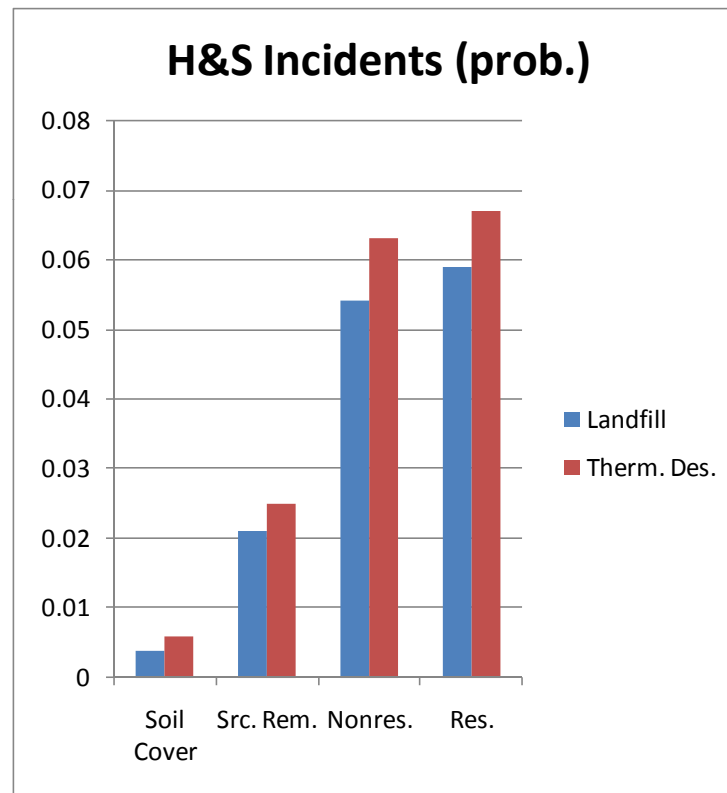
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- Energy consumption
- Greenhouse gas emissions
- Health and safety incidents

# Energy Use and Greenhouse Gas Emissions



# Health and Safety Incidents



# Institutional Controls

| <b>Remedial Alternative</b> | <b>Nonresid. Land Use Only</b> | <b>Maintain Surface Cover</b> | <b>Vapor Intrusion</b> | <b>Manage Soil Excavations</b> | <b>Prohibit GW Use</b> |
|-----------------------------|--------------------------------|-------------------------------|------------------------|--------------------------------|------------------------|
| Soil cover                  | Yes                            | Yes                           | Yes                    | Yes                            | Yes                    |
| Source removal              | Yes                            | Yes                           | Yes                    | Yes                            | Yes                    |
| Nonresidential              | Yes                            | No                            | No                     | No                             | Yes                    |
| Residential                 | No                             | No                            | No                     | No                             | Yes                    |

# Tradeoffs: Focused Removal Versus the Big Dig

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- Cheaper
- Uses less energy
- Generates less greenhouse gases
- More restrictions on future uses of the site
- Requires a commitment to long term management of the site

# Conclusion

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- When it comes to being “green”:  
Less is more