Contaminated Soil Management Guide

COST-SAVING TIPS AND INDUSTRY BEST PRACTICES

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INTRODUCTION:

Without proper planning and due diligence, construction projects can become derailed with unforeseen environmental challenges, especially when contaminated soils are identified.

We get asked all the time:

"What can I do with my contaminated soil?"
"What are the options for soil disposal?"
"How can I save money and still effectively deal with this?"

Disposal is not the only option to deal with impacted soils. Every project has its own unique challenges. Proper planning can identify the tactics that could save time and money. In this guide we'll provide a high-level overview to help you...

- Recognize the soil contaminants that may be present
- Identify potential options for managing contaminated soil
- Save money and reduce schedule disruptions by selecting the right option for your project.

TIP: KNOWING IS HALF THE BATTLE.

If you know or suspect that your property will have contamination, don't skip the upfront due diligence (or go for the cheapest option). Knowing soil conditions ahead of time can help save time and money by creating a comprehensive soil management strategy.

COMMON CONTAMINANTS IN NEW ENGLAND:

New England certainly has its own unique environmental challenges: low-lying spots in urban areas were often filled with poor-quality soil (often containing ash and metals); arsenic and uranium are naturally-occurring contaminants common in the bedrock of some areas; and its long industrial history featured spills that predate environmental regulations.

Here are the top contaminants we see at New England sites:

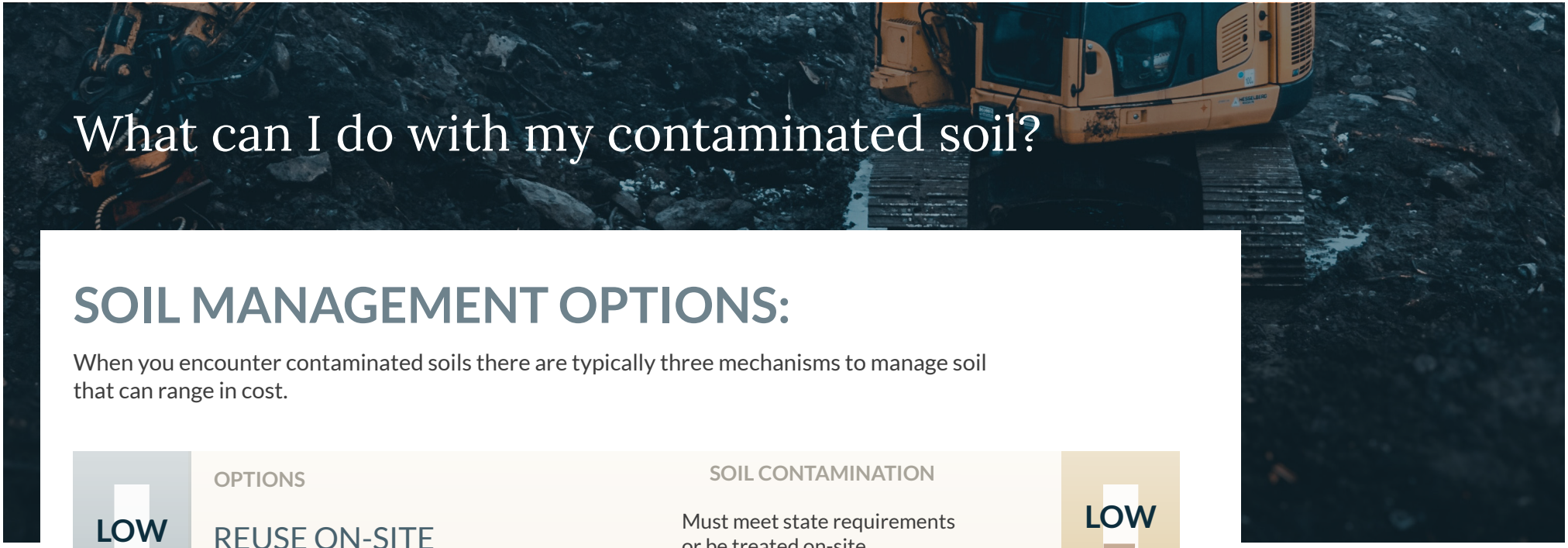
- LEAD (particularly in "urban fill" soils)
- POLYNUCLEAR AROMATIC HYDROCARBONS (commonly found in ash)
- ARSENIC
- OTHER METALS (e.g., nickel and beryllium)
- PESTICIDES AND HERBICIDES
- POLYCHLORINATED BIPHENYLS (PCBs)

Here are links to the local New England agencies for clarity on what is the latest for you:

Connecticut | Massachusetts | Maine | New Hampshire | Rhode Island | Vermont

TIP:
BE AWARE OF EMERGING CONTAMINANTS

As technology advances so does the ability to identify and determine new contaminants in our environment, The list of contaminants, and their regulatory limits, is constantly evolving. Always check with your consultant or your state department of environmental services to stay up-to-date.



What can I do with my contaminated soil?

SOIL MANAGEMENT OPTIONS:

When you encounter contaminated soils there are typically three mechanisms to manage soil that can range in cost.

LOW

COST

HIGH

OPTIONS	SOIL CONTAMINATION
REUSE ON-SITE	Must meet state requirements or be treated on-site.
TRANSPORT OFF-SITE FOR REUSE	Must meet state and/or reclamation requirements.
TRANSPORT TO PERMITTED RECEIVING FACILITY FOR DISPOSAL OR TREATMENT	Soil exceeds state requirements for oil and/or hazardous materials
LANDFILL (DAILY COVER) →	Soil with relatively low contaminant concentrations
ASPHALT RECYCLING →	Soil with petroleum contamination
THERMAL INCINERATION →	Soil with a mix of different contaminants at moderate concentrations
LANDFILL (DISPOSAL) →	Soil with high contaminant concentrations, or special wastes (e.g., asbestos)

LOW

CONTAMINATION

HIGH

TIP: ASBESTOS

Soil that contains building debris can pose special challenges when asbestos-containing material (ACM) is present. Discovering ACM in the middle of a project can significantly affect schedules and costs. Consider testing for asbestos in advance at locations where building debris is present.

When is reusing soil on-site a good option?

SOIL REUSE ONSITE:

On-site reuse of soil is often the most economical approach for a redevelopment project.

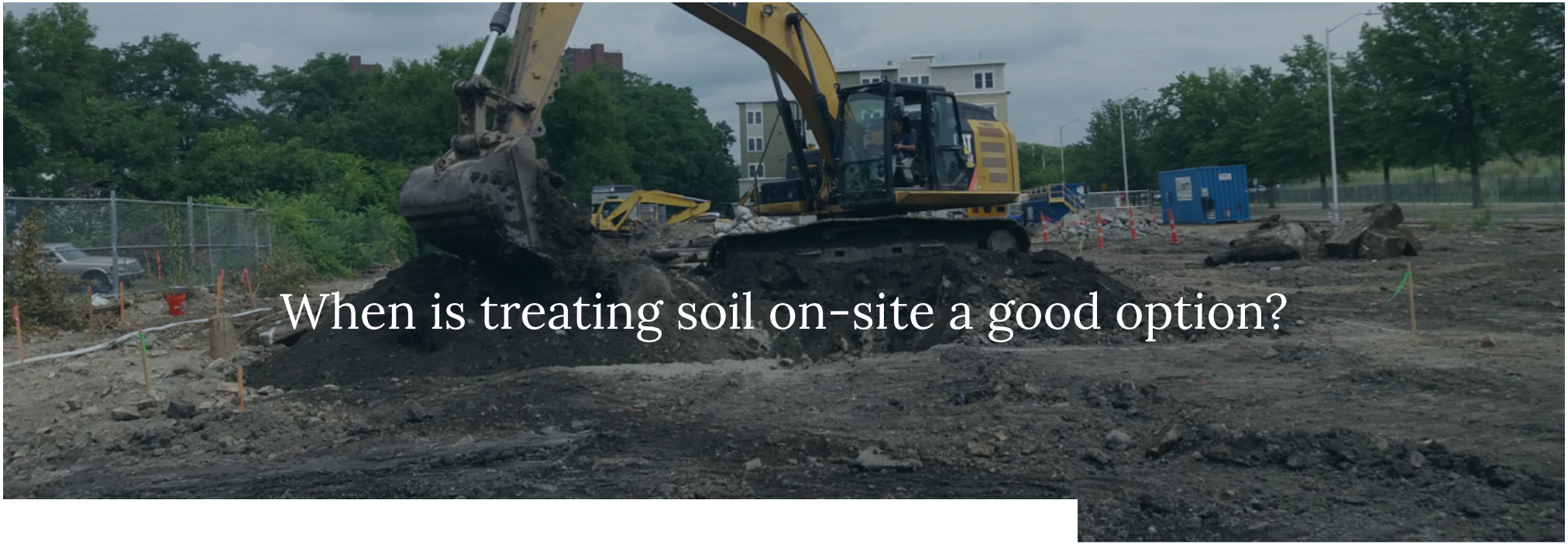
Granular soils with a minor component of fine-grained material (silt and clay) are the most suitable for reuse; soils with higher percentage of fines can typically still be re-used, provided there is willingness throughout the project team.

Soils can often be reused on-site provided the team properly plans in advance. Considerations include:

1. **PROVIDING A SUITABLE AREA FOR PLACEMENT:**
   - Materials of good structural quality, such as sand-gravel-durable debris materials, could potentially be reused below structures
   - Materials of moderate structural quality could potentially be reused below pavement areas
   - Materials of poor structural quality could be used in "greenspace" areas
2. **CONSIDER SITE GRADES EARLY:** Make sure to identify a reuse location that will work for the longevity of the project. For instance, it could be necessary to raise overall site grades to accommodate keeping soil on-site.
3. **DEVOTE RESOURCES:** The contractor must be willing and able to devote sufficient resources to soil reuse. This could include covering soils during rainy days to prevent over-saturation, using soil additives or devoting resources to allow soils to "air dry" when soils become over-saturated, phasing excavations to minimize the quantity of soil generated at a given time, etc.

TIP: PLANNING SAVES

GeoInsight's involvement in a successful school redevelopment project resulted in saving the project over $400,000 by developing a detailed soil reuse approach, conducting periodic site visits to inspect contractor efforts, and coordinating with the project parties.



When is treating soil on-site a good option?

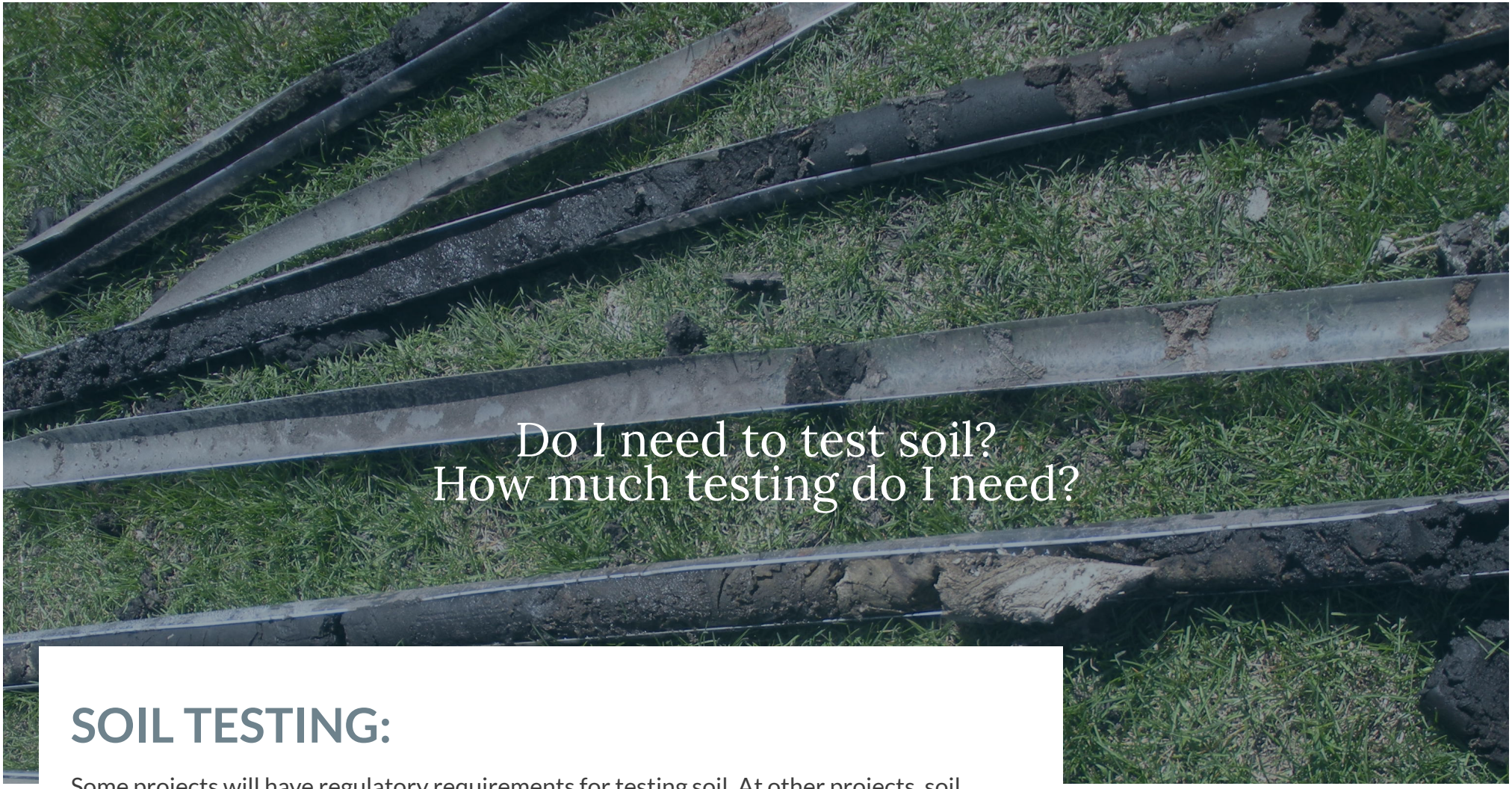
SOIL STABILIZATION:

Soil stabilization is a technique used when contaminants (typically metals) in soil have the potential to leach into groundwater resulting in exceedances above permissible limits. Soil with these characteristics is considered to be a hazardous waste (which has very high costs for disposal), unless it can be stabilized to prevent the metals from leaching. Stabilization allows soil to be managed as a non-hazardous waste, resulting in substantial cost savings for disposal.

PRIMARY USE:	Soil with lead contamination above the leaching limit
SECONDARY USE:	Soil with other metals contamination above the leaching limit (e.g., arsenic, selenium).
NOT FOR USE WITH:	Petroleum-contaminated soil Soil with other organic contaminants (e.g., pesticides, herbicides); Soil containing asbestos or ACM.

TIP: CHECK YOUR STATE REQUIREMENTS

Each state treats contaminated soil differently. You need to know the right questions to ask to ensure you get what you need, and when in doubt, ask an expert.



Do I need to test soil? How much testing do I need?

SOIL TESTING:

Some projects will have regulatory requirements for testing soil. At other projects, soil testing isn't required (but could be done proactively). Get an expert to review your options with you to select a testing program that is appropriate for your project.

CASE STUDY:

GeoInsight had the pleasure of helping a developer manage soil at a project in the greater Boston area. Historical contamination was previously identified at parts of the property, and the developer wanted to reduce potential costs associated with managing over 10,000 tons of soil.

GeoInsight worked closely with the development and construction team and, through a combination of carefully reviewed historical data to identify the areas of contamination followed by confirmatory field testing, almost 7,000 tons of soil were able to be reused on-site. The remaining soil was not contaminated and was reused at other construction projects in the area **at no cost to the developer.** Properly managing the soil at this project saved the developer several hundred thousand dollars in soil disposal costs.

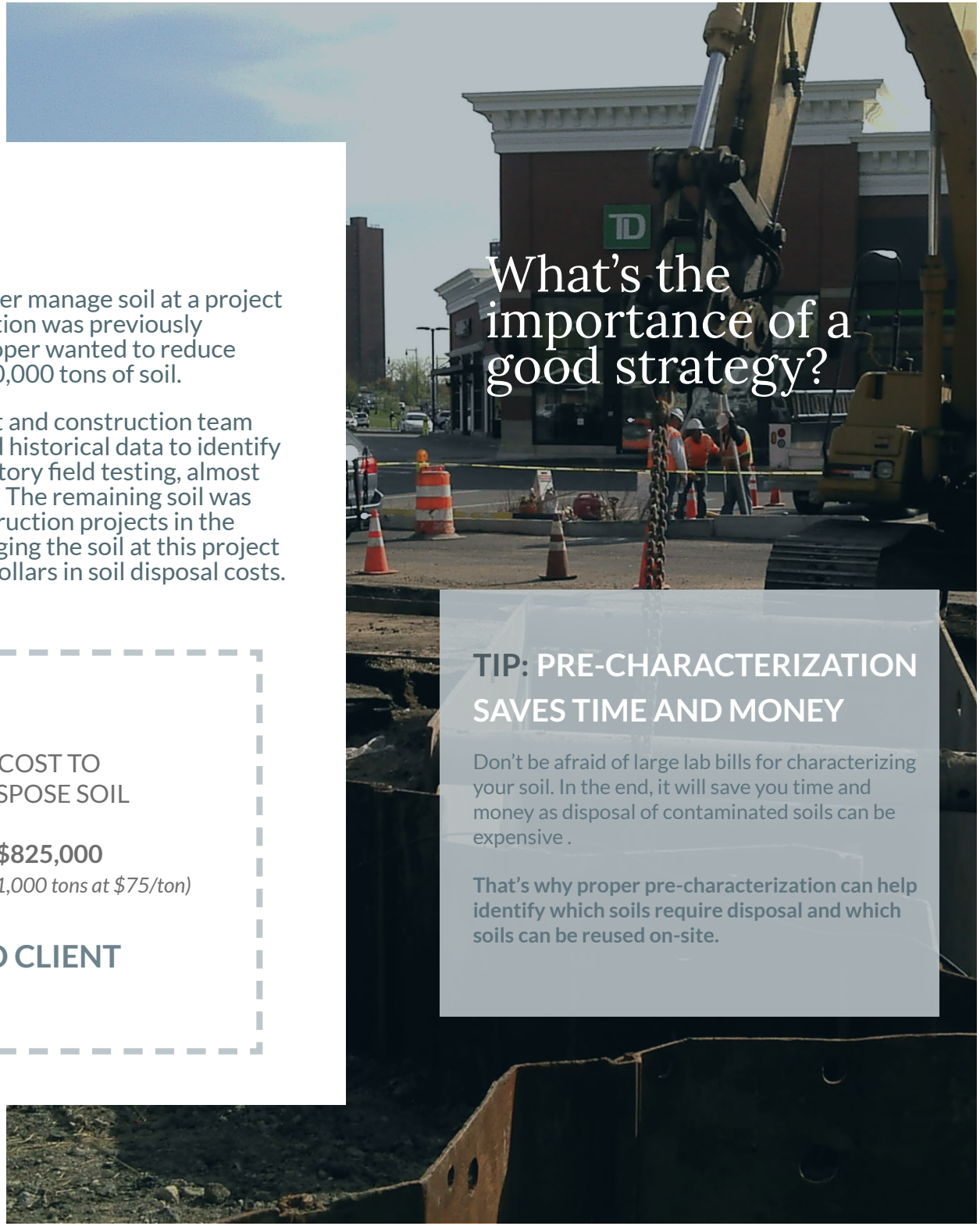
EXAMPLE COST COMPARISON:

COST TO PROPERLY MANAGE SOIL	COST TO DISPOSE SOIL
$25,000	**$825,000**
(Historical review and lab costs)	*(Approx. 11,000 tons at $75/ton)*

TOTAL COST SAVINGS TO CLIENT

$800,000

View Full Case Study



TIP: PRE-CHARACTERIZATION SAVES TIME AND MONEY

Don't be afraid of large lab bills for characterizing your soil. In the end, it will save you time and money as disposal of contaminated soils can be expensive .

That's why proper pre-characterization can help identify which soils require disposal and which soils can be reused on-site.

CUTTING THE RED TAPE:

Experts can help clarify your available soil management options and assist with the navigation of regulatory requirements. Key considerations for managing soil at construction projects include:

1. **KNOW WHAT YOU'RE DEALING WITH —** contaminants are often found in soil and identifying the levels and locations of contamination before construction begins can save time and money later
2. **CONSIDER THE DIFFERENT SOIL MANAGEMENT OPTIONS —** each project is unique and what may work well at one location may not work at another location
3. **GET AN EXPERT INVOLVED EARLY —** reach out to an expert have them help guide you through the process

ADDITIONAL RESOURCES:

Here are some additional resources that can help your next (re)development project.

Rising Above: Supporting Southern New Hampshire University (SNHU)'s New Millyard Parking Garage

Navigating the MCP for Complex Brownfields Redevelopment - Case Study

Redevelopment Project at the Site of Former Stark Manufacturing Co. Textile Mills in Manchester, NH

About GeoInsight

With 25+ years of experience, we've seen a thing or two. That's why our clients rely on us to solve their complex environmental challenges. Our experts manage soil at projects all over New England, and can guide you through the regulatory requirements for each state. Our experience navigating the evolving and complex universe of state and federal environmental regulation, helps us support our clients across New England.

LOCATIONS

MANCHESTER, NH
MIDDLETOWN, CT
LITTLETON, MA
YORK, ME

MULTIDICIPLINARY

ENVIRONMENTAL REMEDIATION
SITE ASSESSMENT
GEOTECHNICAL + CIVIL ENGINEERING
EHS COMPLIANCE
WATER RESOURCES

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