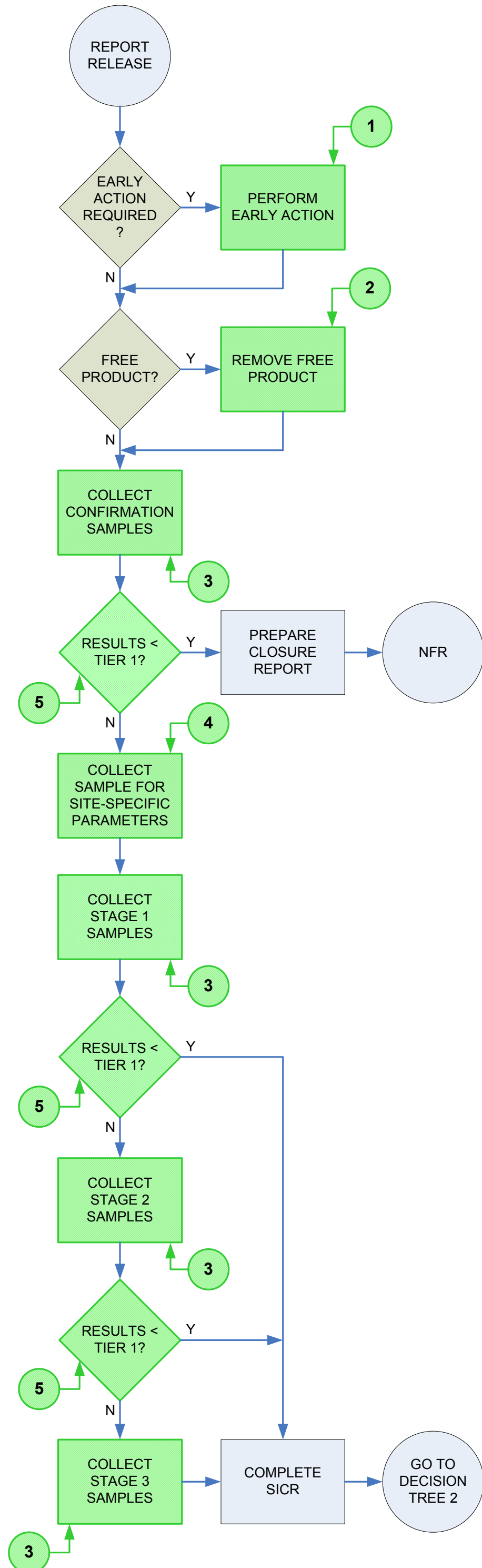


# DECISION TREE 1: EARLY ACTION, FREEPRODUCT REMOVAL, AND SAMPLING



## GREENER CLEANUP STRATEGIES

### 1. EARLY ACTION

Early Action provides many opportunities to implement green approaches, such as:

- Imposing idling restrictions on construction equipment
- Using low-sulfur diesel fuel
- Using alternate fuels, such as E85 or biodiesel
- Using construction equipment with enhanced emissions controls
- Sequencing work to minimize double-handling of materials
- Covering stockpiles with tarps
- Collecting rain-water for on-site use, such as dust control
- Using recycled materials for fill

### 2. FREE PRODUCT REMOVAL

Some free product recovery systems can be powered by renewable energy sources, such as solar panels. Depending on the quantity and quality of the free product being recovered, in some cases it may be recyclable or suitable for use as an alternative energy source.

### 3. SAMPLE LOCATIONS

Sample locations should be carefully selected to efficiently identify the extents of contamination. In some cases, phasing sampling events could help reduce costs by eliminating unnecessary samples.

### 4. SITE-SPECIFIC PARAMETERS

Site-specific parameters are needed to determine site-specific remediation objectives under a Tier 2 analysis. A Tier 2 analysis could help reduce the amount of contaminated soil requiring removal and disposal, thereby saving time, money, and the environmental impacts associated with excavating and transporting the contaminated soil. Site-specific parameters include hydraulic conductivity, soil bulk density, soil particle density, moisture content, and organic carbon content.

### 5. TIER 1 COMPARISON

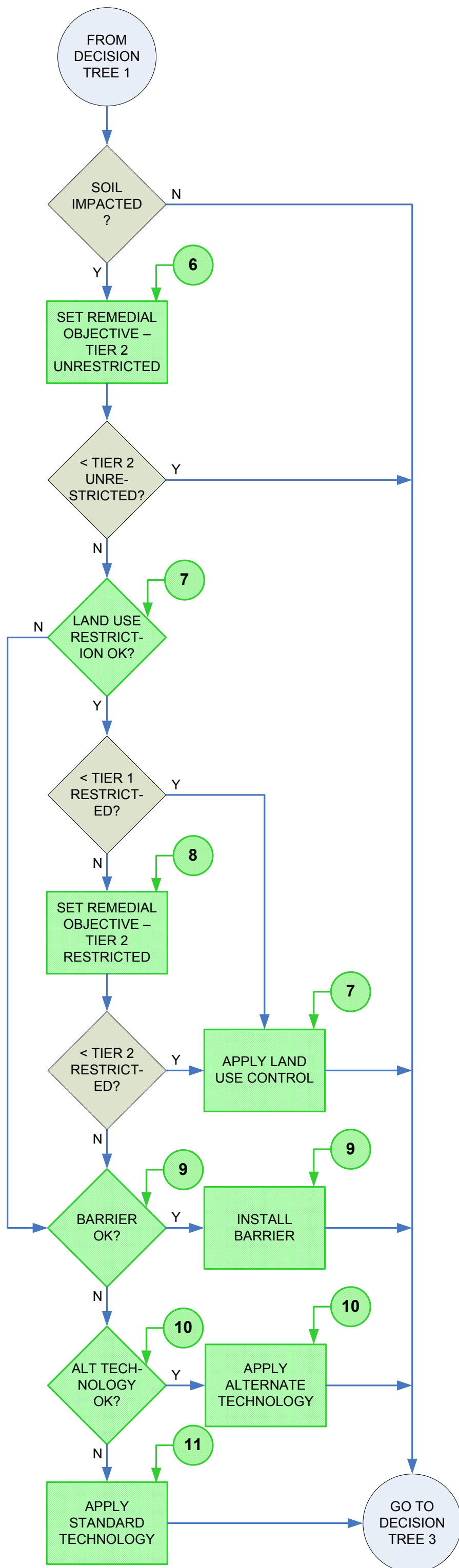
The Illinois EPA requires that the results of sampling performed to delineate the extents of contamination be compared to the most stringent Tier 1 remediation objectives. This does not limit the use of a Tier 2 or Tier 3 analysis to set remediation objectives after the contamination has been fully delineated, however. In fact, failure to use site-specific remediation objectives may result in certain corrective action costs being ineligible for reimbursement from the Fund.

Greener Cleanups: How to Maximize the Environmental Benefits of Site Remediation  
Leaking Underground Storage Tank Program

January 2009



# DECISION TREE 2: SOIL REMEDIATION



## GREENER CLEANUP STRATEGIES

### 6. TIER 2 ANALYSIS - UNRESTRICTED

A Tier 2 Analysis determines site-specific remediation objectives based on site-specific parameters, described in more detail in Decision Tree 1. In some cases a Tier 2 Analysis under an unrestricted, residential scenario could produce remediation objectives that minimize the amount of contaminated soil requiring cleanup.

### 7. LAND USE RESTRICTIONS

If the future use of a site is industrial or commercial, a land use restriction allows Tier 1 remediation objectives for industrial/commercial properties to be referenced. These remediation objectives may be less stringent than the Tier 1 residential objectives, thereby reducing the amount of contaminated soil requiring cleanup.

### 8. TIER 2 ANALYSIS - RESTRICTED

A restricted Tier 2 Analysis determines site-specific remediation objectives for industrial/commercial and construction worker scenarios. These remediation objectives may be less stringent than the Tier 2 residential objectives, thereby reducing the amount of contaminated soil requiring cleanup.

### 9. ENGINEERED BARRIERS

In certain cases an engineered barrier can be placed over contaminated soil to prevent users of the site from being exposed to the contamination. Engineered barriers can include asphalt, concrete, buildings, and three feet of clean fill. Placing an engineered barrier will likely reduce the amount of contaminated soil requiring cleanup. Engineered barriers can help save time and money, especially if they are coordinated with the redevelopment of the site, such as placing a planned parking lot over contaminated soil.

### 10. ALTERNATE CLEANUP TECHNOLOGIES

While excavation and off-site disposal is often the quickest cleanup strategy, it is also often the most expensive. If a cleanup doesn't have to be completed right away, an alternate cleanup technology could save money while reducing the environmental impacts of excavating and transporting contaminated soil. Alternate cleanup technologies include in-place oxidation, in-place reduction, bioremediation, and dual-phase vapor extraction.

### 11. STANDARD CLEANUP TECHNOLOGIES

If standard cleanup technologies are planned for a site, specifically excavation and off-site disposal, then the green approaches under "Early Action" on Decision Tree 1 should be considered. In addition, cleanup work should be sequenced to integrate with redevelopment activities. This will minimize the need to fill excavations that may not need to be filled if cleanup is coordinated with the redevelopment activities.

Greener Cleanups: How to Maximize the Environmental Benefits of Site Remediation  
Leaking Underground Storage Tank Program

January 2009



