



# Naval Air Station Jacksonville

Installation Restoration Program

## Remedial Investigation at Operable Unit 2: An Overview

### ***The Remedial Investigation (RI)***

- ✓ Identified primary sources of contamination to support early cleanup of Operable Unit (OU) 2 (stage 1)
- ✓ Determined the type and amount of other hazardous waste contamination that resulted from past practices (stage 2)
- ✓ Evaluated potential effects of site contaminants on human health and the environment
- ✓ Assessed the need for additional cleanup actions

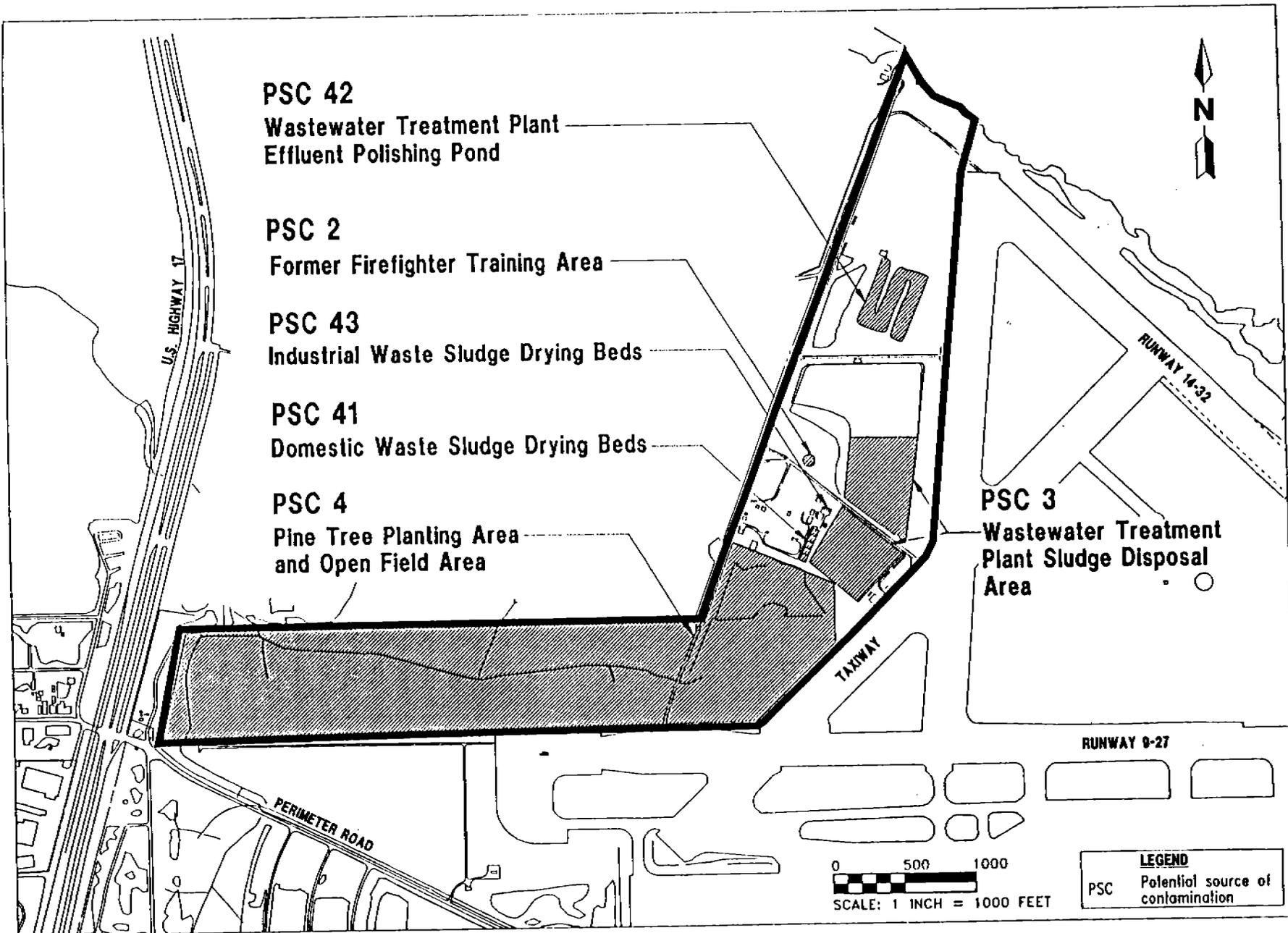
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*Individual sites studied during the RI at OU 2 are known as Potential Sources of Contamination (PSCs) and are shown above.*

Location of PSCs at Operable Unit 2





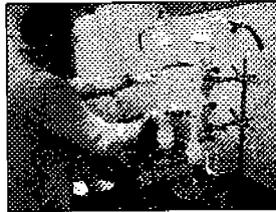
# Naval Air Station Jacksonville

## Installation Restoration Program

### Remedial Investigation (RI) at Operable Unit (OU) 2: The Process



Groundwater sampling



Sample analysis gives a clear understanding of environmental conditions.



Sediment sampling

RI field studies assessed

- groundwater,
- surface water,
- soil,
- sediment contamination, and
- other environmental conditions.



Record keeping is an important part of field work.

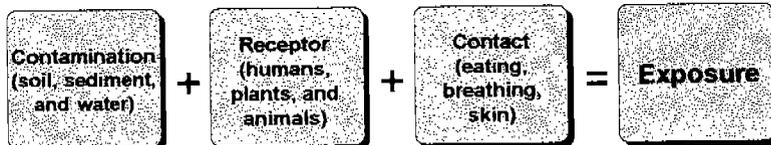


Soil sampling



Surface water sampling

Risk assessments used field study findings to estimate risks to human health and the environment. Risk assessment findings form the basis for cleanup decisions at a site. At OU 2, existing and potential future risks were found to be within USEPA guidelines that are protective of human health and the environment.



Exposure assessment (one step of a risk assessment) evaluates current and future potential contact with contamination by humans and wildlife.

### What Happens Next?

- ✓ Complete the RI
- ✓ Develop the Proposed Plan
- ✓ Hold the Proposed Plan public meeting and comment period
- ✓ Publish the Record of Decision



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### Remedial Investigation (RI) at Operable Unit (OU) 2: Completed Actions

#### Interim Cleanups at OU 2

The first stage of the RI

- identifies primary contaminant sources
- shows that early cleanups known as Interim Remedial Actions (IRAs) were needed at four source areas.



Contaminated soil removal at PSC 41.

- Contaminated soil and other material removed
- Mixed material with cement dust and water to stabilize
- Stabilized material added to backfill at PSC 42



Thermal desorption unit at PSC 2.

- Contaminated soil removed
- Soil treated with heat to remove contaminants (thermal desorption)
- Excavated area backfilled with treated soil, graded, and replanted

- *In situ* stabilization to control contaminant sources
- Contaminated material from PSCs 3, 4, 41, and 43 added to cleanup at PSC 42
- Waste consolidation for a faster, more cost-effective cleanup



Cleanup operations at PSC 42.

#### **Continued Actions**

- ✓ PSCs 41, 42, and 43 in closure documentation process
- ✓ PSC 2 transferred to the petroleum program
- ✓ PSCs 3 and 4 will be placed in "No Further Action Required" status



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## Installation Restoration Program

### Natural Attenuation in Environmental Cleanup

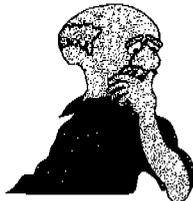
#### Webster's Definitions

**nat-u-ral** *adj.* 1. Present in or produced by nature. 2. Of, relating to, or concerning nature. 3. Conforming to the usual or ordinary course of nature.

**at-ten-u-ate** *v.* 1. To reduce in force, value, or amount: weaken. 2. To lessen the density of.

#### Environmental Definition

*Natural attenuation is the reduction in mass, concentration, or mobility of contaminants in the environment by physical, chemical, and biological processes.*

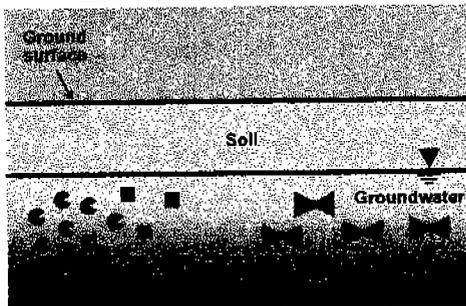


### Now, what does that mean?

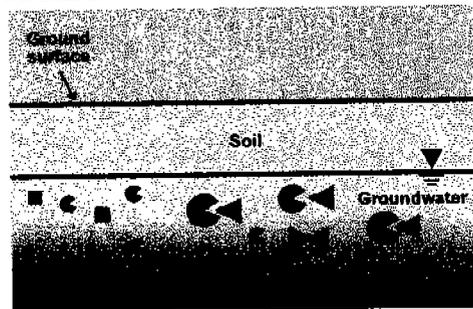


- Soil, sediment, or groundwater contaminants are left undisturbed
- Natural processes reduce amount of contaminants
- Not a "do-nothing" solution
- Requires monitoring to measure effectiveness
- Specific conditions must be met for natural attenuation to be used
- Cost-effective, nonintrusive method of environmental cleanup

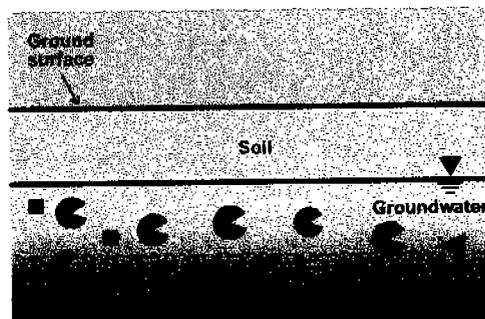
#### Current Conditions



#### Natural Attenuation at Work



#### Future Results



- ◀ Contaminants
- Food and Growth Sources (carbon dioxide, hydrogen, oxygen, and nitrogen)
- Natural Organisms (bacteria, for example)

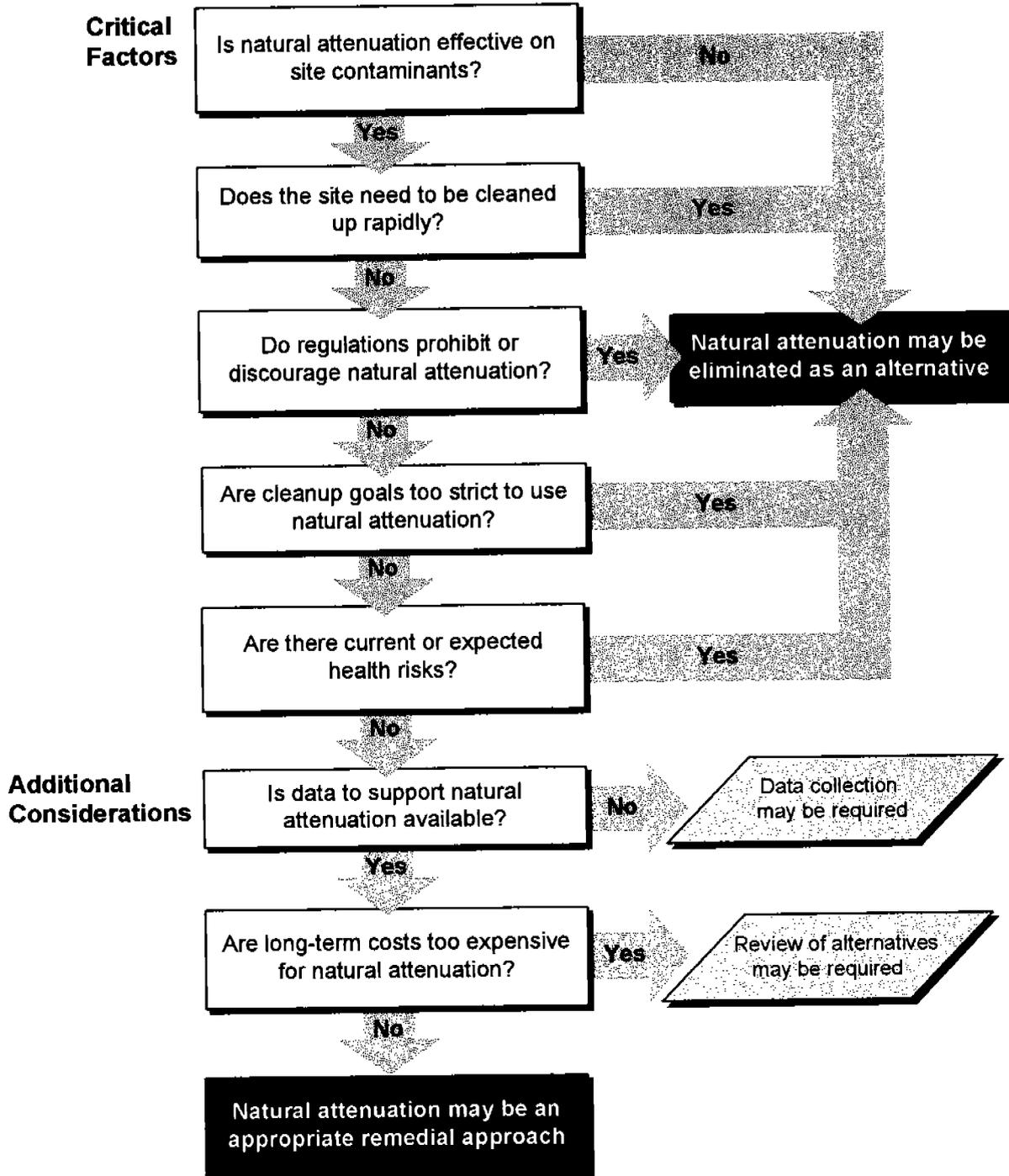
*Natural attenuation at work on groundwater contaminants.*



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## Installation Restoration Program

### Is Natural Attenuation the Right Cleanup Approach?





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## Installation Restoration Program

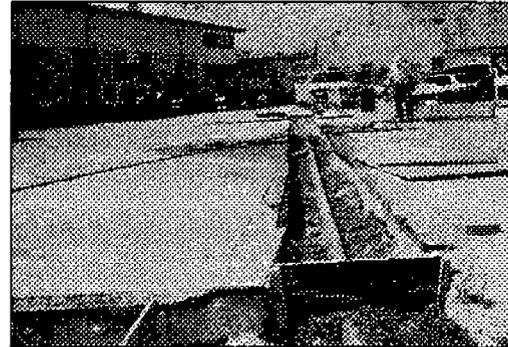
### Cleanup Moves Forward at Building 106

#### History

- Base dry-cleaning facility since 1962
- Dry-cleaning solvent used in operations

#### Investigations

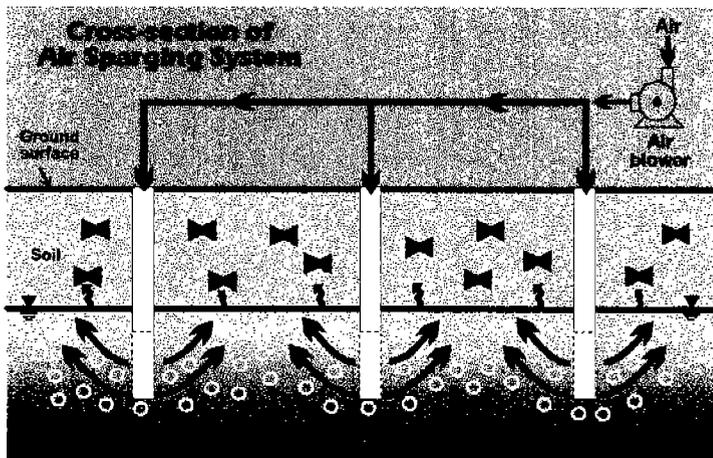
- Sampling showed solvent contamination
- Pilot study to predict effectiveness of cleanup technologies
- Interim cleanups are underway



Building 106

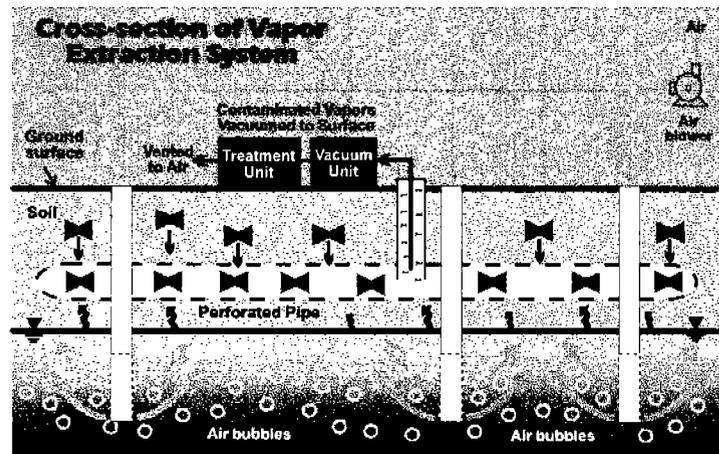
### Cleanup Technologies

#### Air Sparging Working With Soil Vapor Extraction



- Air pumped into groundwater
- Bubbles form, carrying contaminants into soil above groundwater

▼ Contaminated Vapor



- Horizontal perforated pipe in soil
- Vacuum extracts contaminated vapor from soil
- Vapor routed through treatment unit on surface
- Treatment unit removes contaminants
- Treated vapor vented into the air



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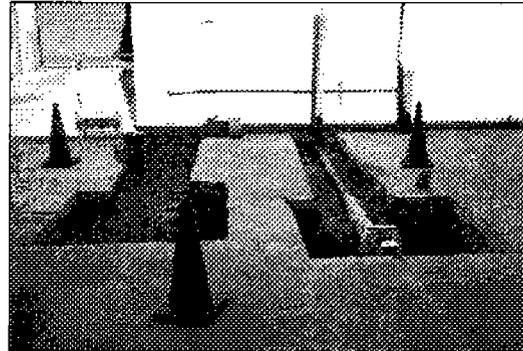
### Cleanup Moves Forward at Building 780

#### History

- Houses aircraft maintenance operations
- Activities included chemical stripping of aircraft parts, and other items using industrial cleaning solvents
- Waste liquids (including solvents) discharged into sewer systems

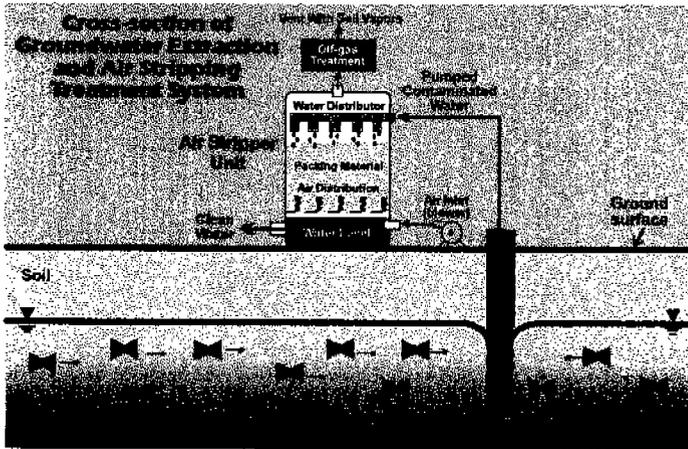
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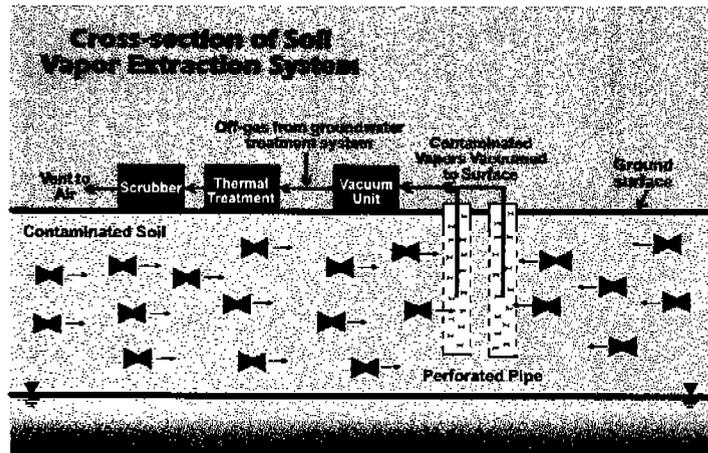
Building 780

### Cleanup Technologies



▶ Contaminants

- Contaminated groundwater pumped from a well
- Contaminated groundwater pumped to air stripper for treatment
- Treated water to sanitary sewer
- Vapors from air stripper process added to soil vapors already collected for treatment



- Vertical perforated pipe in soil
- Vacuum extracts contaminated vapors from soil
- Vapors routed to surface for heat treatment, and through scrubber for acid gas removal