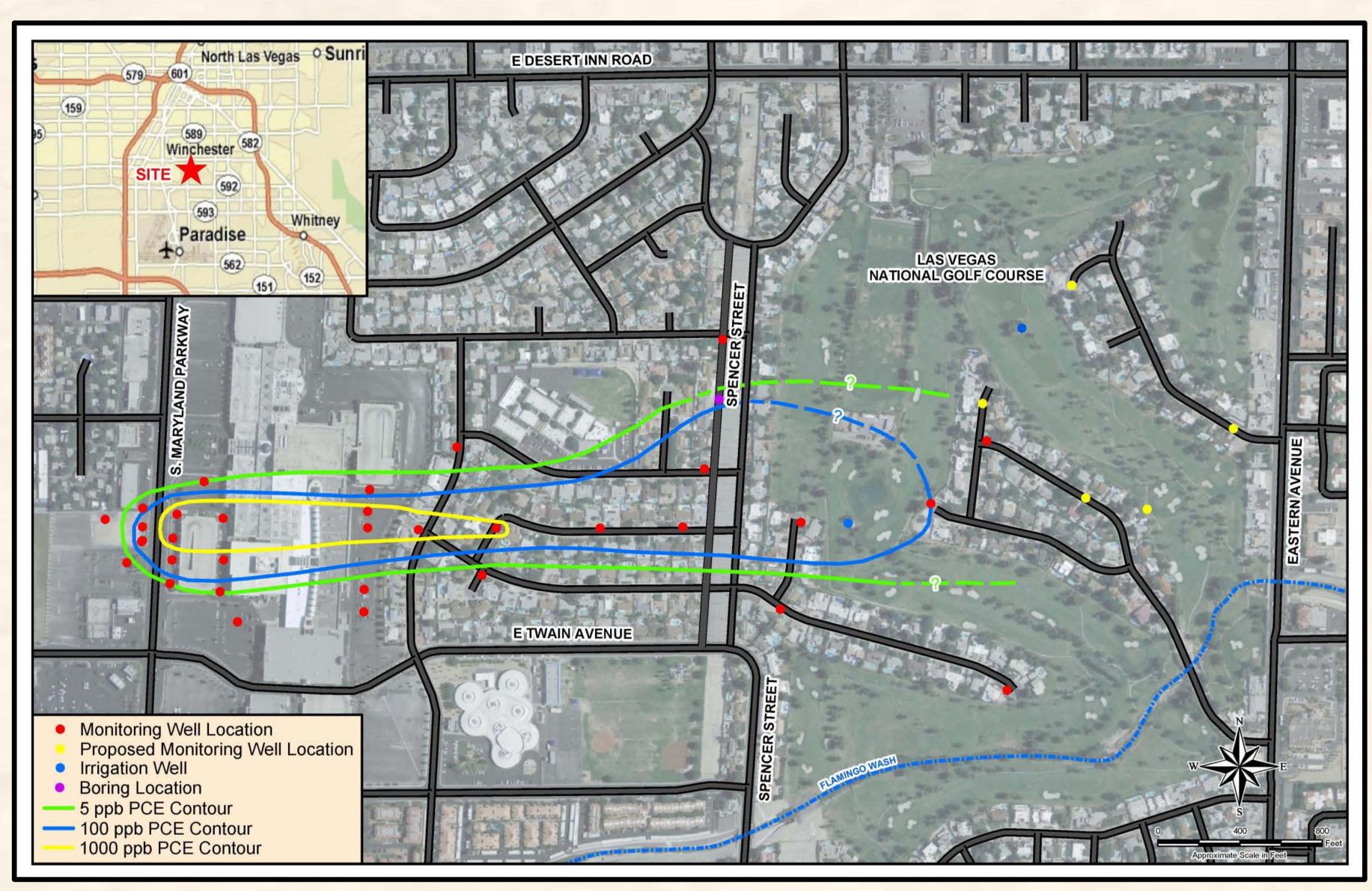
# **INVESTIGATION AND CLEANUP OF GROUNDWATER**



**Approximate Extent of PCE Plume in Groundwater** 

# **Estimated Timeline for Cleanup of Groundwater**

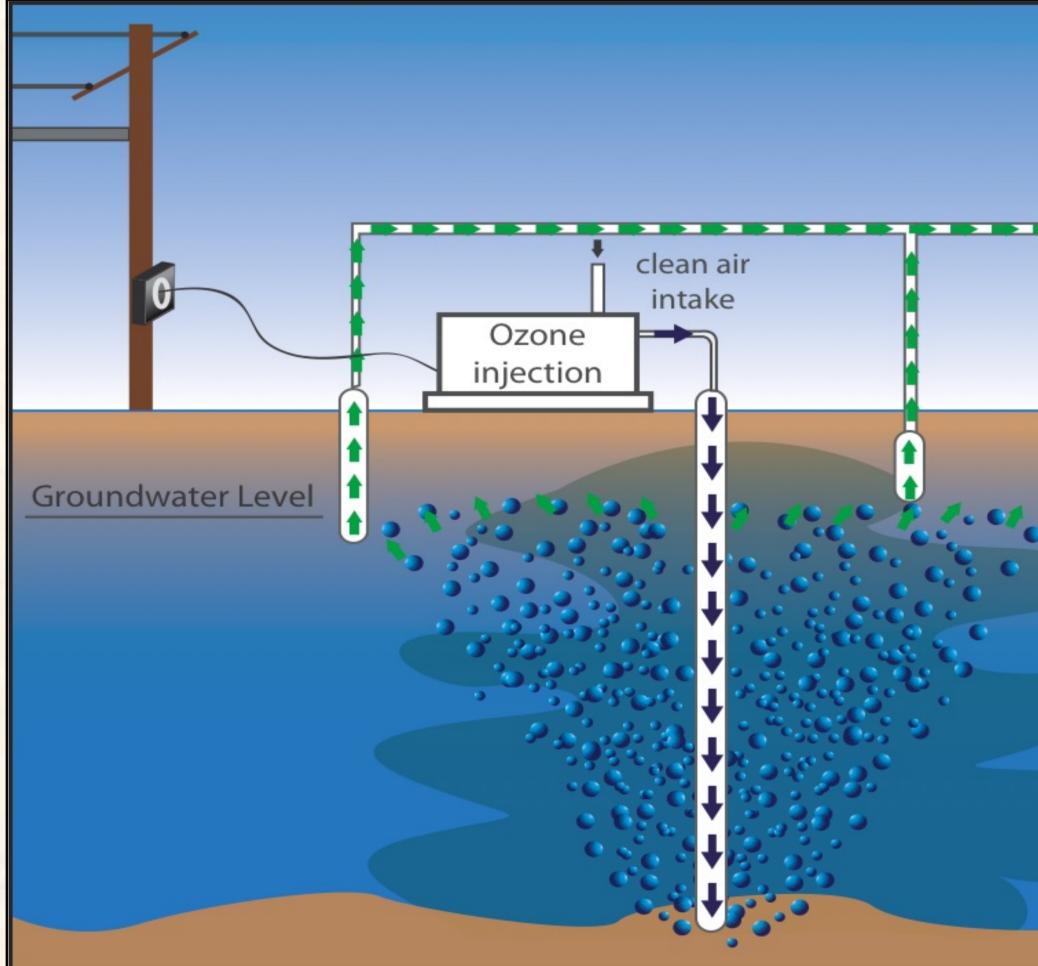
Fall 2011	- NDEP concurs with
Winter 2012	<ul> <li>Planning and pilot t</li> </ul>
Spring 2012	<ul> <li>— Pilot testing continu</li> </ul>
<b>Summer 2012</b>	— Draft Corrective Act
Fall 2012	— Final Corrective Act
Winter 2013	— Proposed Plan relea
Spring 2013	— Proposed Plan final
<b>Summer 2013</b>	— Remedial Design an

- revised CAP for Groundwater
- testing begin
- nues, data evaluated
- ction Report submitted
- ction Report, begin Proposed Plan
- eased for public review and comment
- alized; Record of Decision prepared
- nd Remedial Action

The contaminant of concern is tetrachloroethylene (PCE). It is a degreaser used by dry cleaners and is also found in some consumer household products. Discharges of PCE by the dry cleaner resulted in soil contamination at the site of the former dry cleaners.

### Potential remedies for cleanup of the PCE-contaminated groundwater must take into consideration the following criteria:

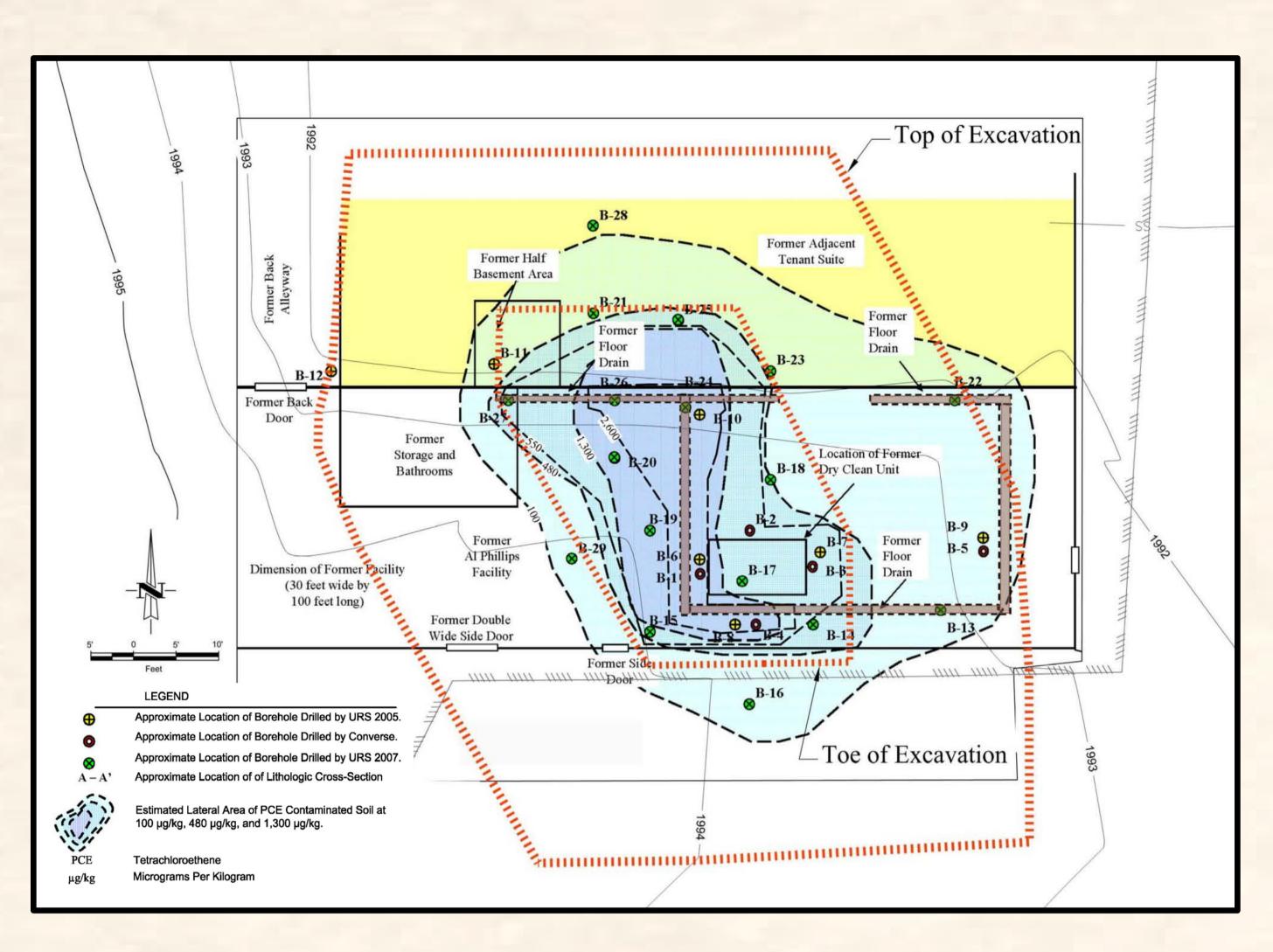
- 1. The potential for achieving interim cleanup goals
- The technology's ability to control, reduce, or eliminate the groundwater to vapor 2. intrusion pathway
- 3. The technology's ability to remove contaminant mass under controlled conditions.
- 4. Public health and safety concerns associated with implementing the technology in or near a residential area.
- 5. Public perception and acceptance issues.
- 6. Relative cost of implementation.



Vapor-extraction wells create a vacuum in the subsurface to direct the flow of liberated vapors to recovery or monitoring wells.



	ean air charge
	Fugitive ozone collection and off-gas treatment
Va	dose Zone
	Saturated Soil
	Clave
	Clay



## **Excavation Plan with Approximate Extent of PCE Soil Contamination**



**Backfilling after Excavation of PCE Contaminated** Soil

# CLEANUP OF SOURCE AREA SOIL

Fall 2010 Winter 2 Spring 20 Summer

Fall 2011

Potassium Permanganate Added to Bottom of Excavation The cleanup of source area soil began in August, 2011 and finished in October, 2011. The cleanup consisted of:

- 2)

# **Timeline for Cleanup of Soil**

)	<ul> <li>Draft CAP for Soil submitted to NDEP for rev</li> </ul>
2011	- Revised CAP for Source Area Soil submitted
011	— Permitting, contracting for implementation
2011	<ul> <li>Excavation site marked, utilities cleared. ISC waste management plans submitted</li> </ul>
L	<ul> <li>Excavation of contaminated soil, ISCO, backs</li> <li>preparation of Corrective Action Report</li> </ul>



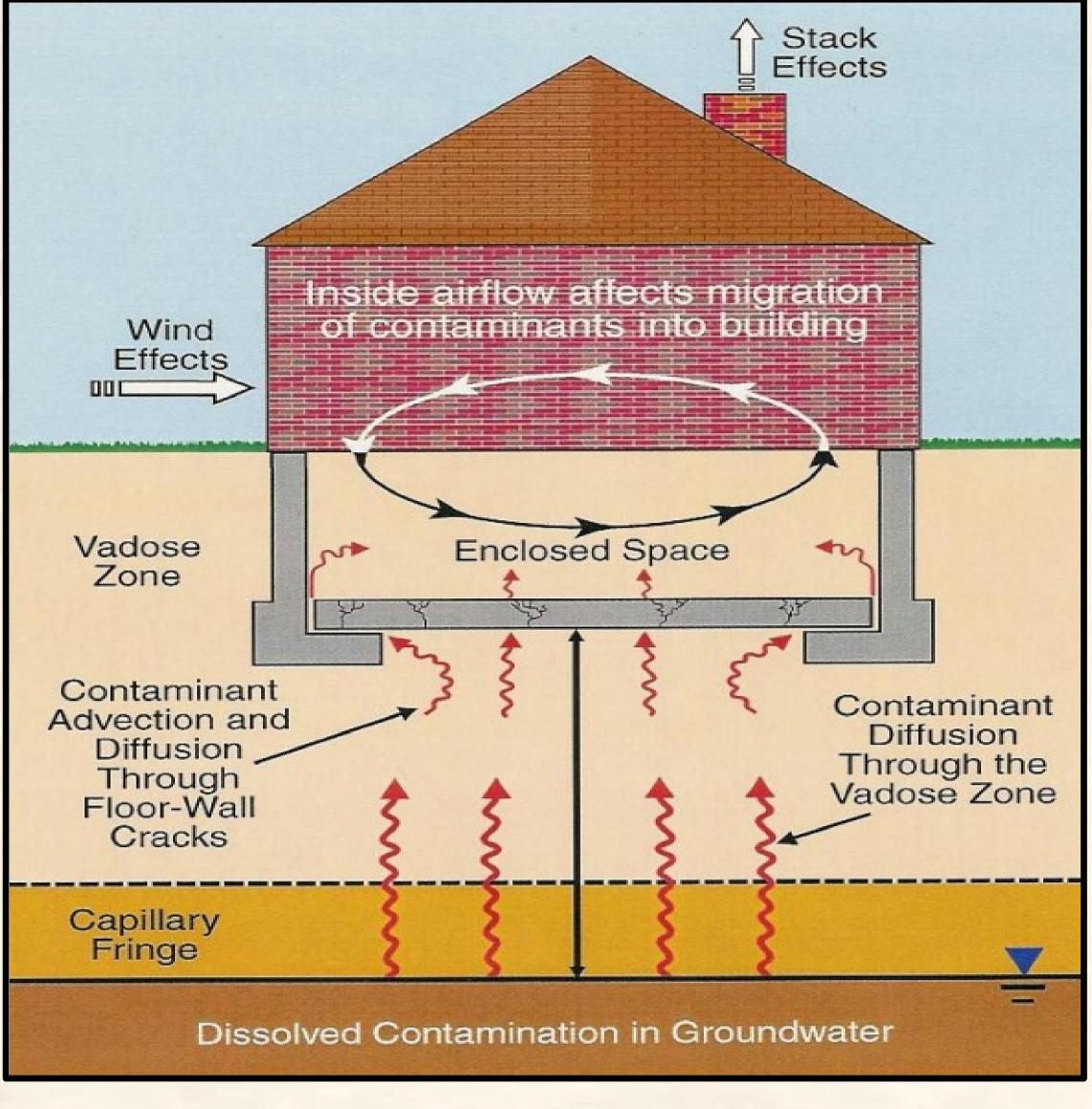
1) Excavation of soil and disposal of PCE-contaminated soil at a permitted hazardous waste facility Chemical oxidation at base of excavation (see photo above) using potassium permanganate to treat soil and shallow groundwater; the permanganate oxidizes and destroys PCE 3) Backfill and grading of soils at the former dry cleaners

eview

of CAP SCO contingency plan and

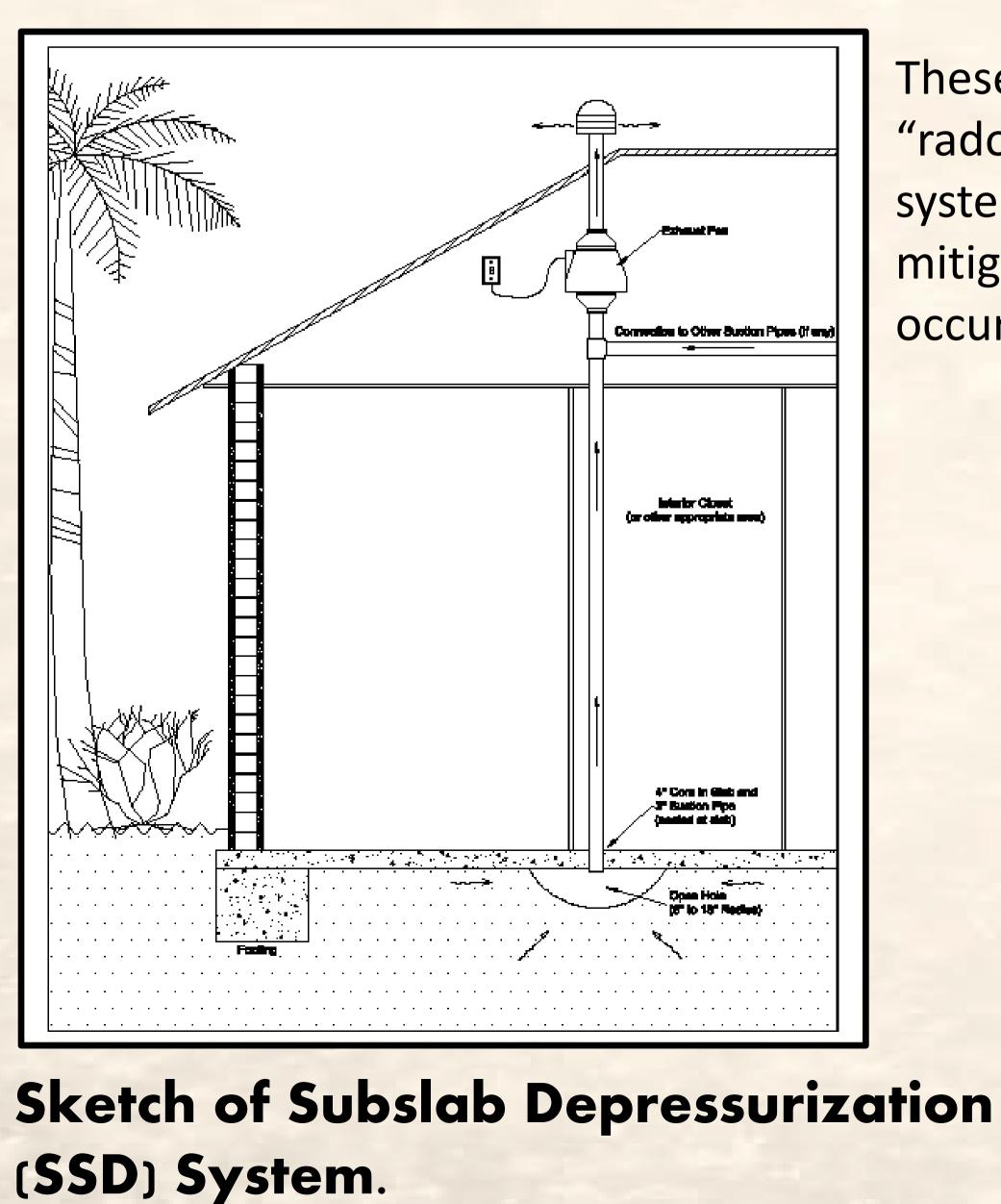
kfilling and site restoration,





## **The Vapor Intrusion Process**

As PCE in groundwater evaporates, it creates vapors that fill spaces in subsurface soil. Vapors in the soils above the contaminated groundwater can migrate upward and into buildings that overlie the plume. Your house acts like a vacuum, drawing vapors into the house through foundation cracks and other openings.



# **INDOOR AIR SAMPLING AND MITIGATION PROGRAM**

# **Estimated Timeline for Indoor Air Sampling and Additional Mitigation**

2007-2008

**Summer 2011** 

Fall 2011

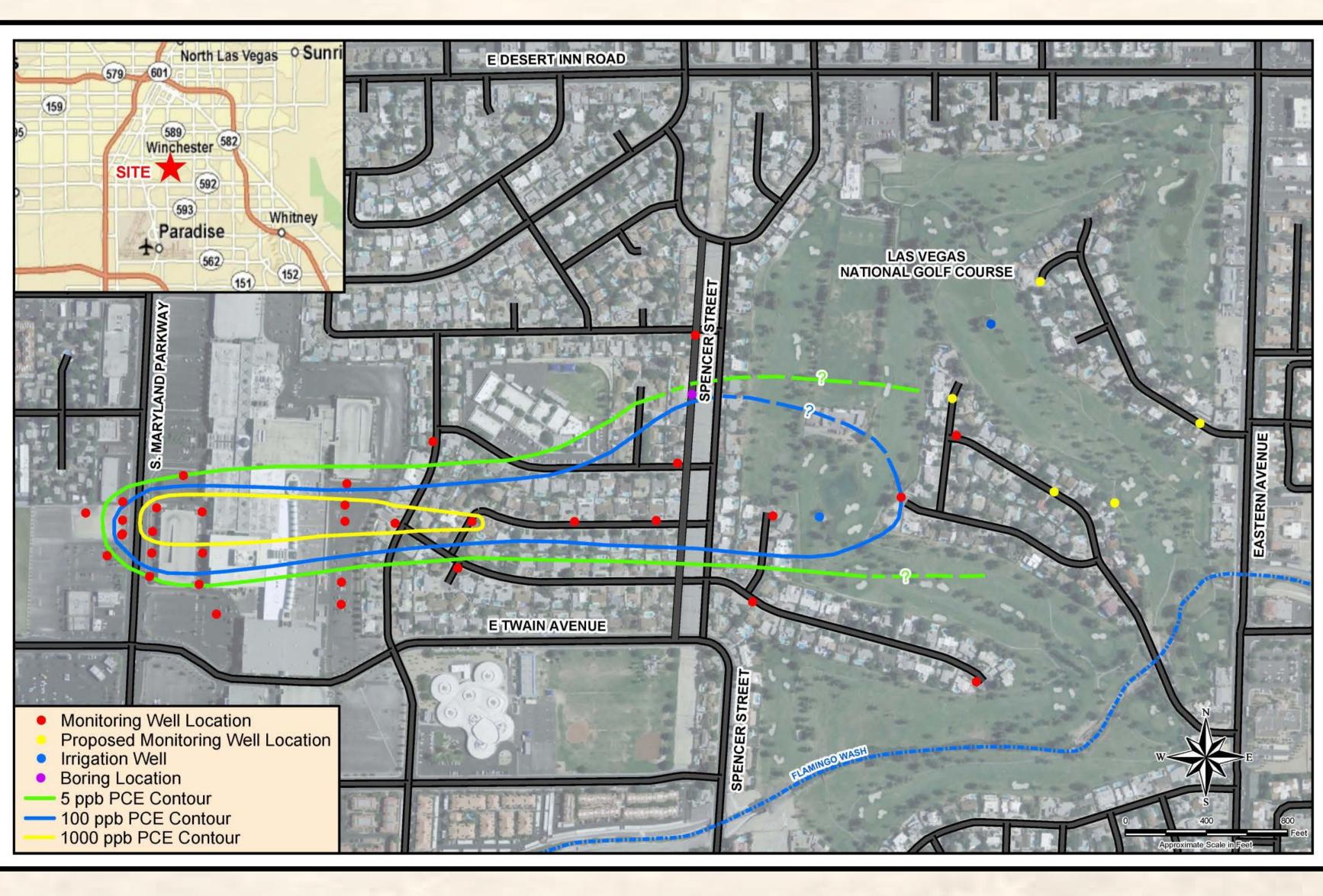
**Winter 2012** Spring 2012 **Summer 2012 Fall/Winter 2012/13** 

- sampling

These systems are also known as "radon systems" because these systems were developed to mitigate homes for naturally occurring radon intrusion.









— NDEP tests indoor air in 97 homes; 14 SSD systems installed

— Revised "Work Plan for Mitigating Indoor Air and Well Water" submitted to NDEP; NDEP comment letter issued; addendum to Work Plan submitted

— Installation of additional monitoring wells to help determine which homes will be offered indoor air

- Residents notified and offered IA sampling. Sample homes using "real-time" and offsite laboratory analysis Plan for and install additional SSD systems if needed

— Sampling and modification to SSD systems, if needed to achieve NDEP's interim-action level for indoor air Residents notified and offered IA sampling.



**Approximate Extent of PCE Plume in Groundwater** 

The sampling devices on the right are called "Summa canisters" which are placed in the homes for a period of approximately 24 hours. Tedlar bags and sampling syringes (left) can be used to collect an instantaneous sample.

Indoor air will be sampled in homes based on groundwater sampling conducted in November and December 2011.

### Initial Investigation, Spill Report, and Follow-on Investigations.

Samples of soil and groundwater are collected as part of an environmental site assessment. Evaluate whether the site poses a threat to human health and the environment and whether further investigation is needed.

### **Corrective Action Report.**

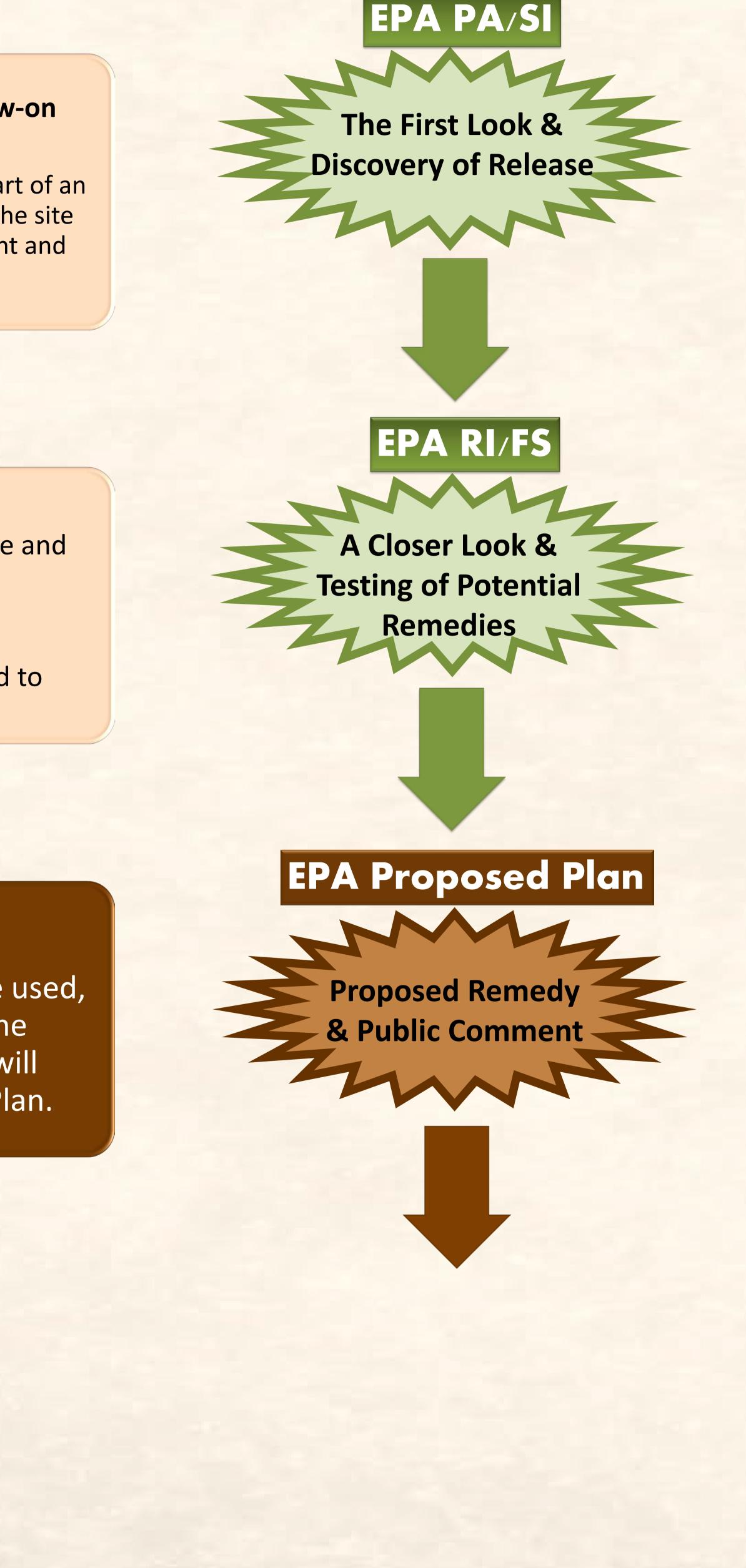
This phase of the process determines the nature and extent of contamination at the site, tests which technologies are capable of treating the contamination, and evaluates the cost and performance of technologies that could be used to clean up the site.

### **Proposed Plan**

Explains which cleanup alternative will be used, and describes the response actions and the remedy selected for cleanup. The NDEP will solicit public comment on the Proposed Plan.

# THE CLEANUP PROCESS

## NDEP Process Analogous to "Superfund" Cleanup Process





### **Record of Decision (ROD)**

Explains which cleanup alternative will be used. It summarizes site history, site description, site characteristics, community participation, past and present activities, contaminated media, the contaminants present, description of the response actions and the remedy selected for cleanup.

### **Remedial Design/Remedial Action (RD/RA).**

**N**DEP reviews and approves the final design for the cleanup. Throughout this phase, NDEP will keep community members and leaders advised about the progress of the cleanup

# **Community Participation**

Community meetings will be held at various stages of the investigation and cleanup process. Comments from community members and other stakeholders will be solicited on the Proposed Plan; these comments will be documented in the ROD. You may also contact the NDEP by e-mail or telephone.

The NDEP maintains an on-line Administrative Record for this Site at: http://ndep.nv.gov/pce/foia.htm

Maryland Square Resident Call-in Line (702) 486-0975. Leave a message and we will return your call within one to two work days.

