

PCE/TCE Groundwater Contamination Update

Budget Committee
October 17, 2006



Overview

- Recap of contamination/litigation
- Recap of rate increase
- Current status of litigation
- Current status of remediation
- Future plans

Recap (1)

- Contamination discovered in 1989
- Two rounds of State investigation
 - 1994 URS report – finds widespread contamination, recommends further investigation
 - 1996 NERI Study – identified a number of potential sources and recommended further work
- City involved due to leaking sewers and operation of municipal wells
- 1996 – City hires Michael Donovan with strategy to pursue responsible parties' insurance and recover all City costs
- 1999 – As money to pursue strategy runs out, City borrows funds from Lehman Bros.

Initial discovery of PCE in new water tank during testing following construction.

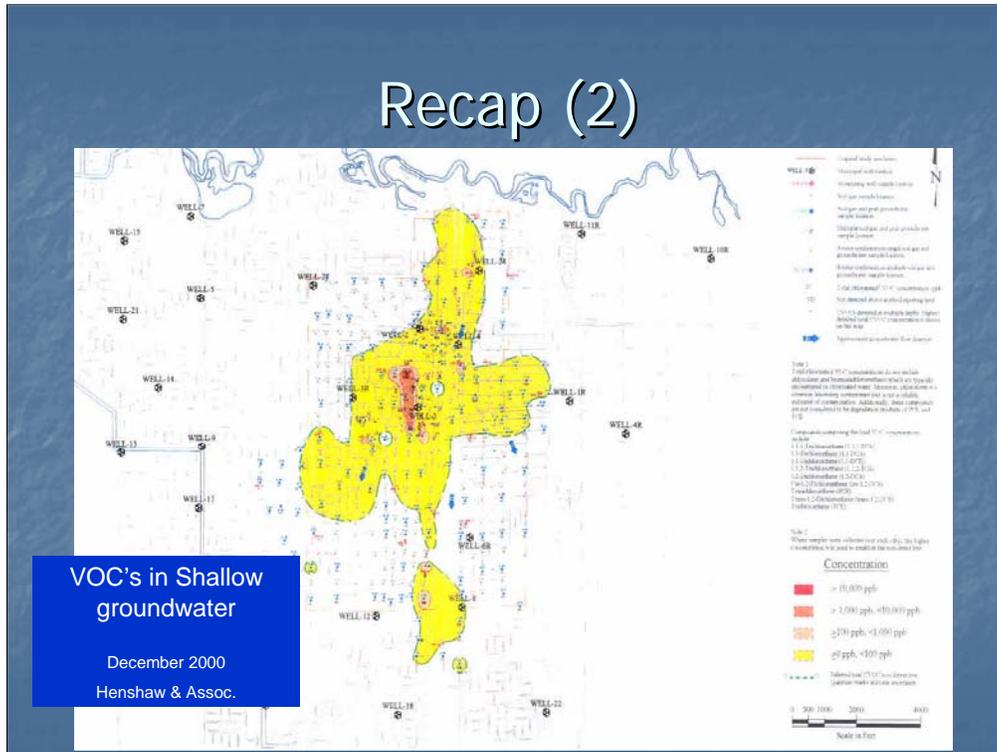
PCE typically used in dry cleaning. TCE used in various industrial cleaning and degreasing operations.

URS study done under contract with State Department of Toxic Substances Control and followed up on earlier work done by the State Regional Water Quality Control Board (RWQCB)

NERI study done under contract with the RWQCB and recommended additional source research and testing, sewer line investigation, perform vapor extraction, additional groundwater sampling and property title/business research.

Both studies identified “potentially responsible parties” including dry cleaners, printers and other industrial sites/businesses.

Recap (2)



VOC's – volatile organic compounds

Work by Donovan's consultants tried to show contamination as one co-mingled plume and did not investigate deeper groundwater.

Subsequent work and legal agreements divided the plume and litigation into 5 separate units. (Northern, Central, Eastern/Busy Bee, Southern and Southwest/Central.

In addition, investigation has shown greater depth of contamination.

Recap (3)

- 2004 – After some early apparent success, strategy ends with various court rulings and City Council action to terminate attorneys and consultants involved; new attorneys and consultants hired
- 2004 – Settlements reached with:
 - Busy Bee defendants who will pursue cleanup
 - USF&G (one of City's insurers) for \$9 million and City assumed future defense costs
 - Lehman - \$32 million claim for principal & interest settled with \$6 million payment to Lehman

Busy Bee remediation estimated at \$500,000; their insurer paying for performance contract; City potentially liable for up to \$100,000 in excess costs under some circumstances.

USF&G settlement was on a \$100,000 indemnity policy and shows the potential value of defense obligations.

City had previously repaid \$1.9 million to Lehman.

Recap (4)

- 2005 – Central Plume Settlement
 - \$7.375 million received from other parties
 - \$2.2 million added by City to establish C.P. trust fund
 - total cost (including operations & maintenance for 30 years) for cleanup method proposed by City estimated at \$15.8 million
- 2006 – Settlement (in concept) Southern Plume; needs court approval
- 2006 – Northern and SW/Central Plume joint defense work nearly completed and settlement mediations underway
- City still in litigation with Donovan and other City insurers

Settlements also include rights to access to land for future remediation facilities and other terms which have value, but were not quantified.

Southern Plume remediation estimated at \$3.2 million. Settlements include \$1.51 million in cash from other parties, plus an earlier settlement of \$1 million.

2004 Rate Increase Criteria

- No General Fund Impact
- Pay all costs (net of settlements) including past expenses
- Pay past expenses over 15 years, starting in year 3 of program
- Pay out of water fund, not sewer fund
- Maintain reserve in water fund
- Maintain water capital program, with allowance for water meters
- Modified "pay as you go" approach

Slide from 2004 rate presentation

2004 Cost Estimate

- Net cost of implementing remediation plan is estimated to be \$45.7 million and includes capital, operating, and legal expenses, and settlements due to other parties less settlement revenues due to the City
- Above costs include pay back of past expenses (total \$12.2 million, which includes \$1.9 million of expenses owed to the sewer utility)

Slide from 2004 rate presentation

Remediation Techniques

- Soil Vapor Extraction (SVE) – vacuum fans remove vapors from soil above groundwater via special wells; vapors removed from air with carbon or other methods
- “Sparging” – Injection of air bubbles or ozone in groundwater to trap vapor and carry PCE to the soil above where it is removed by SVE

Remediation Techniques

- Groundwater Extraction – pumping groundwater containing PCE and removing from the water with carbon or other methods
- Ongoing monitoring and reporting
- SVE/Sparge could run for five years
- Groundwater extraction will take 30 +/- years

Drilling



Two types of drilling rigs:

At left, rotary drill used for deep samples and for monitoring or extraction wells

At right, cone penetrometer rig used for shallower samples; provides accurate lithology data as well as samples.

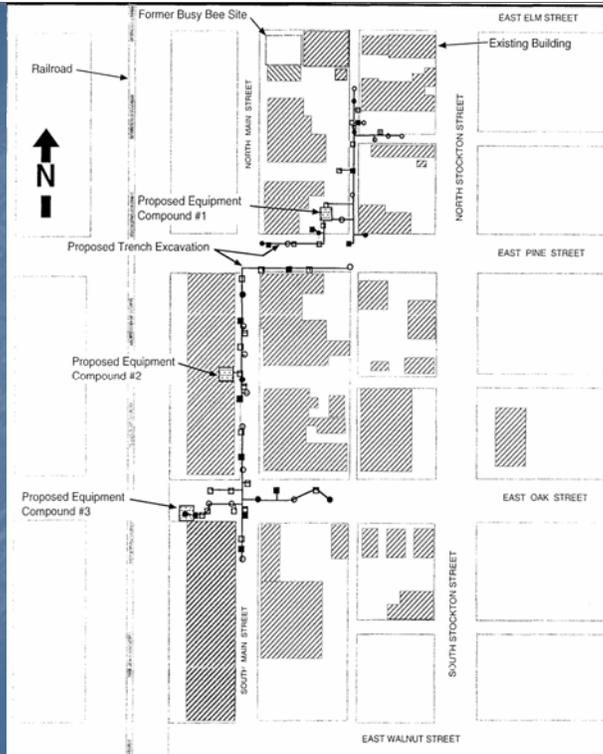
Sampling



Hollow core auger, sample tubes

Busy Bee Remediation

- Source located at Elm/Main
- Air sparging wells located to south
- Treatment units located on Pine and Oak streets



2 treatment units, not 3 as shown on plan.

Busy Bee System

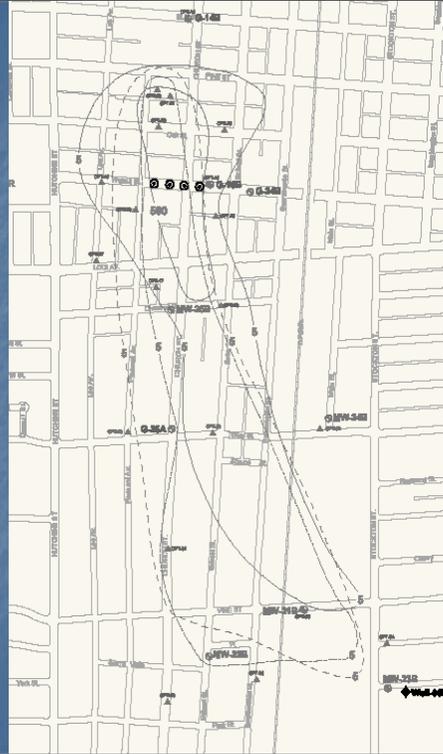


Top right – Pine St. in Adopt-A-Child parking lot
Lower right – Oak St. at railroad tracks W/Main
Top – Interior of Pine St. system

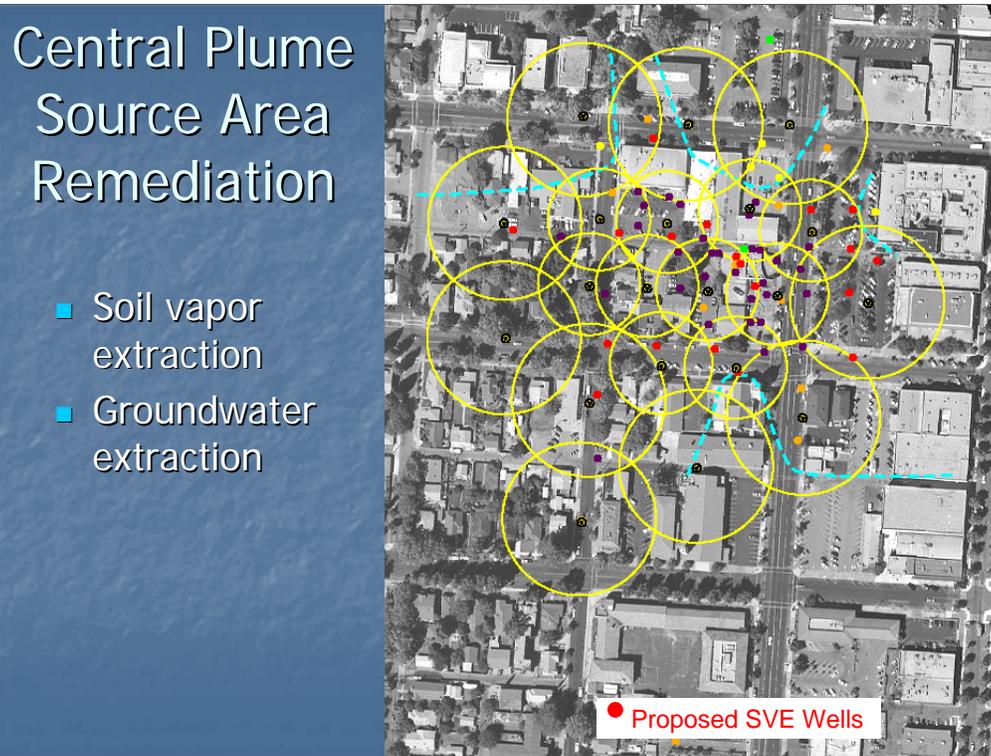
Busy Bee system installed and being operated by responsible party and their insurance company per terms of settlement agreement.

Central Plume Remediation

- Source area at alley south of Pine between Church & Pleasant
- Plume extends nearly one mile south, with eastern movement at southern end
- Wellhead treatment planned at City Well 6 in Blakely Park
- Groundwater extraction planned at Walnut Street at southern part of high concentration area



Map of Central Plume PCE in groundwater.



Schematic layout of proposed Central Plume Soil Vapor Extraction wells.

Guild Soil Vapor Extraction System



System turned over to City as part of settlement

Soil Vapor Extraction Plumbing & Valves



Vacuum blowers in plywood enclosure to reduce noise

Soil Vapor Extraction



Carbon vessels remove PCE from air stream

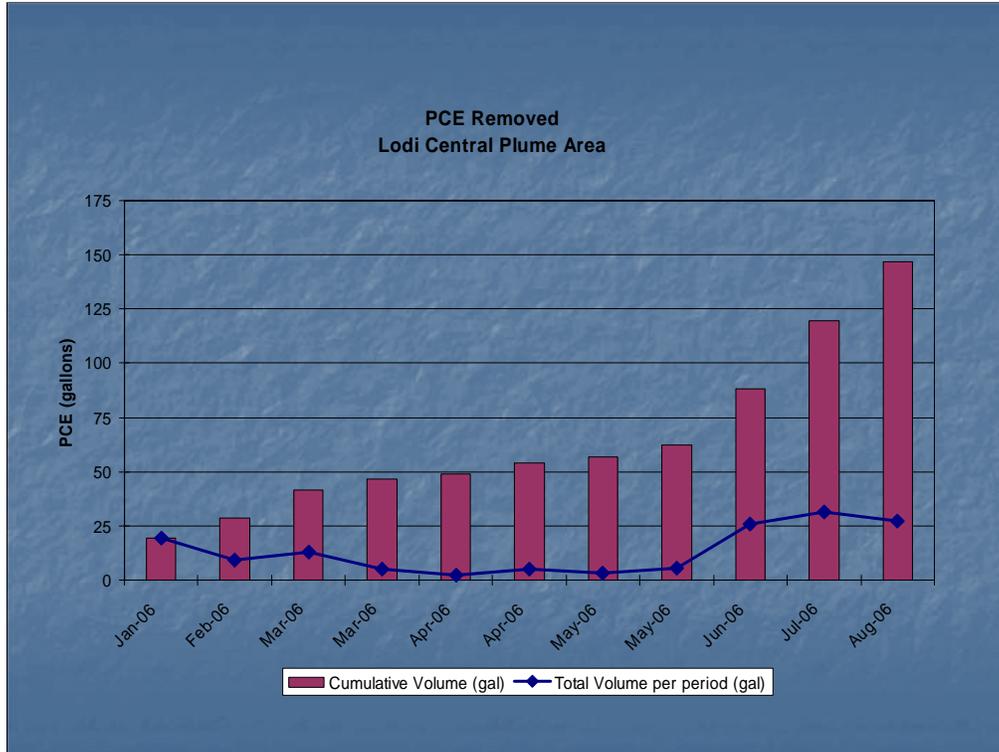
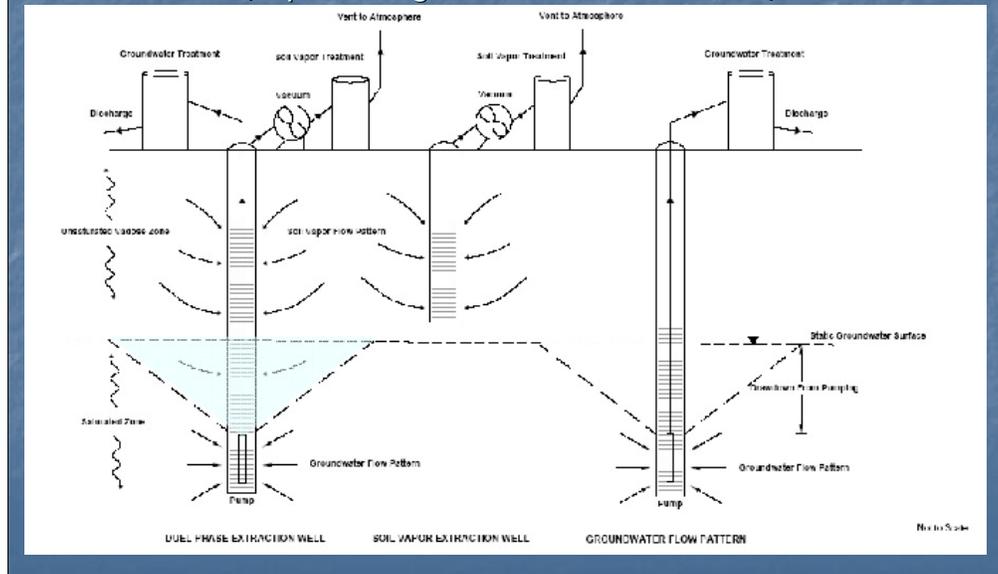


Chart shows PCE removed with the City reoperation of Guild system in 2006 – nearly 150 gallons (about 2,000 pounds) has been removed. The extended pilot test of the Guild system removed an estimated 7,200 pounds and the short pilot test at Oddfellows removed an estimated 1,050 pounds. (PCE weighs 13.6 pounds per gallon) Thus, an estimated total of 750 gallons of PCE has been removed to date. However, one gallon of PCE can contaminate 200 million gallons of water at the drinking water limit. As a point of reference, the entire City uses just over 5 billion gallons of water per year.

New Approach – Dual Phase Extraction (vapor and groundwater in one well)



Schematic drawings of:

At right, groundwater extraction well which pumps contaminated water and equipment removes contaminant at surface.

At center, soil vapor extraction well in which vacuum blowers at surface pull contaminated vapor from soil and equipment removes contaminant at surface.

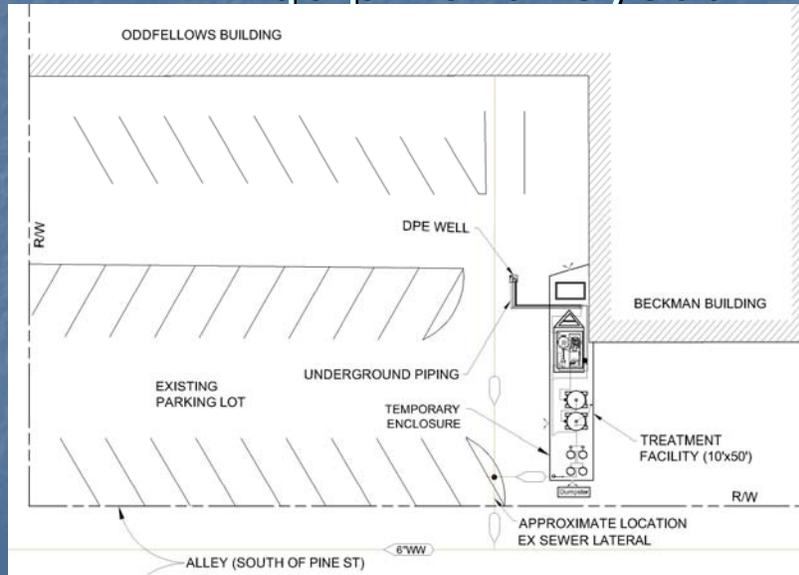
At left, combined dual phase extraction well does both above removals in one well. Saturated soil dewatered by groundwater pump (shaded area) expose more soil to vacuum which removes more contaminant in less time.

DPE Well at Oddfellows Parking Lot



Well (white, round cover at center) has been drilled. Equipment has been ordered and installation permits are being obtained. Soil and water drums will be removed.

DPE Equipment Layout



Equipment is temporary; once data is obtained, final system will be designed to optimize use of existing underground pipe and available land and equipment. Final system will be installed in 2007.

Future Plans (2006/7)

- Central Plume –
 - Finish DPE test design & install full system
 - Install down-gradient capture & treatment system at Well 6R (2007/8)
- Southern Plume
 - Issue Request for Proposals for remediation
- Northern & Southwest/Central Plume
 - continue settlement negotiations
 - hope to complete in early 2007
 - begin remediation work afterwards

Future Plans (2007+)

- Ongoing monitoring
 - consolidate monitoring & reporting to city-wide rather than individual plumes
 - simplify reporting
 - bid work directly rather than through other consultants
- Revisit 2004 rate increase criteria when:
 - most capital costs are known
 - we have better O&M cost estimates
 - significant legal costs are over

Ongoing monitoring costs should go down over time.

2004 rate increase should be reconsidered in the future as costs are finalized.

Questions/Comments?

- Information being posted on City website
- Older reports available at Library
- Website includes e-mail address for inquiries