

Remediation of Petroleum Hydrocarbons Released to the Subsurface

Stephen G. Reuter
Geologist Manager

Petroleum Storage Tank Bureau
New Mexico Environment Department

stephen.reuter@state.nm.us

505-222-9577

Program Overview

- Petroleum Inspection Group
 - Prevention & Inspection
 - Funded by Federal UST, Tank Fees, Corrective Action Fund
- Remedial Action Technical Staff
 - Corrective Action at LUST sites
 - Funded by federal LUST, CAF

Remediation Universe

- Approximately 976 active LUST sites
- NFA an average 45 sites/year past 5 years
- Average 20 new releases/year past 5 years
- Average Cost to Clean-up \$350,000/site
- Larger sites can cost \$5,000,000+

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Case History Hobbs City Wells

Comparison

- KAFB-BFF

- GW Plume ~120 acres
- NAPL Plume 55 acres
- Depth to GW ~490'bgs
- Av Gas/Jet Fuel

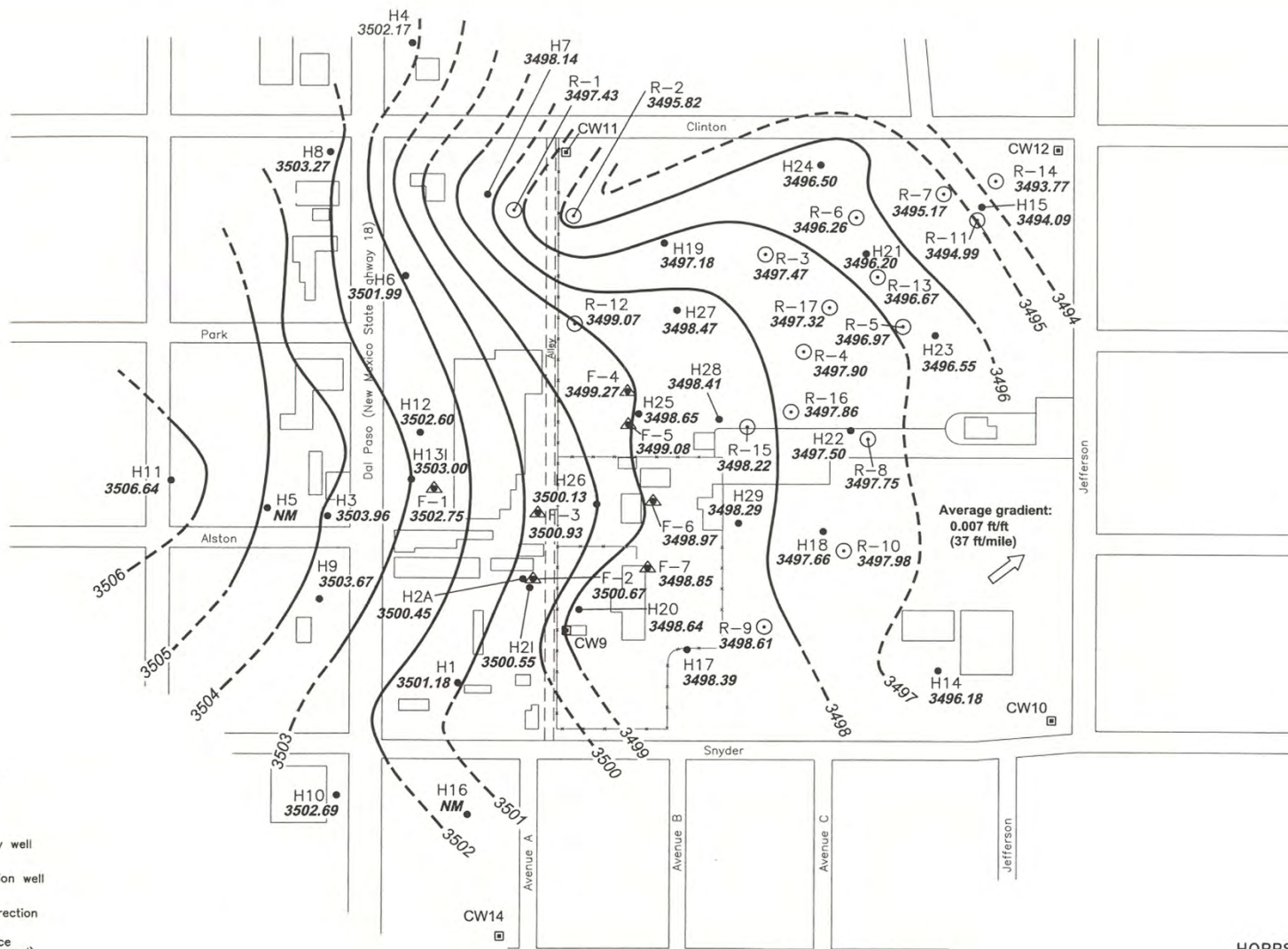
- Hobbs City Wells

- GW Plume 25 acres
- NAPL Plume 5 acres
- Depth to GW ~120'bgs
- Gasoline/diesel

Remediation System

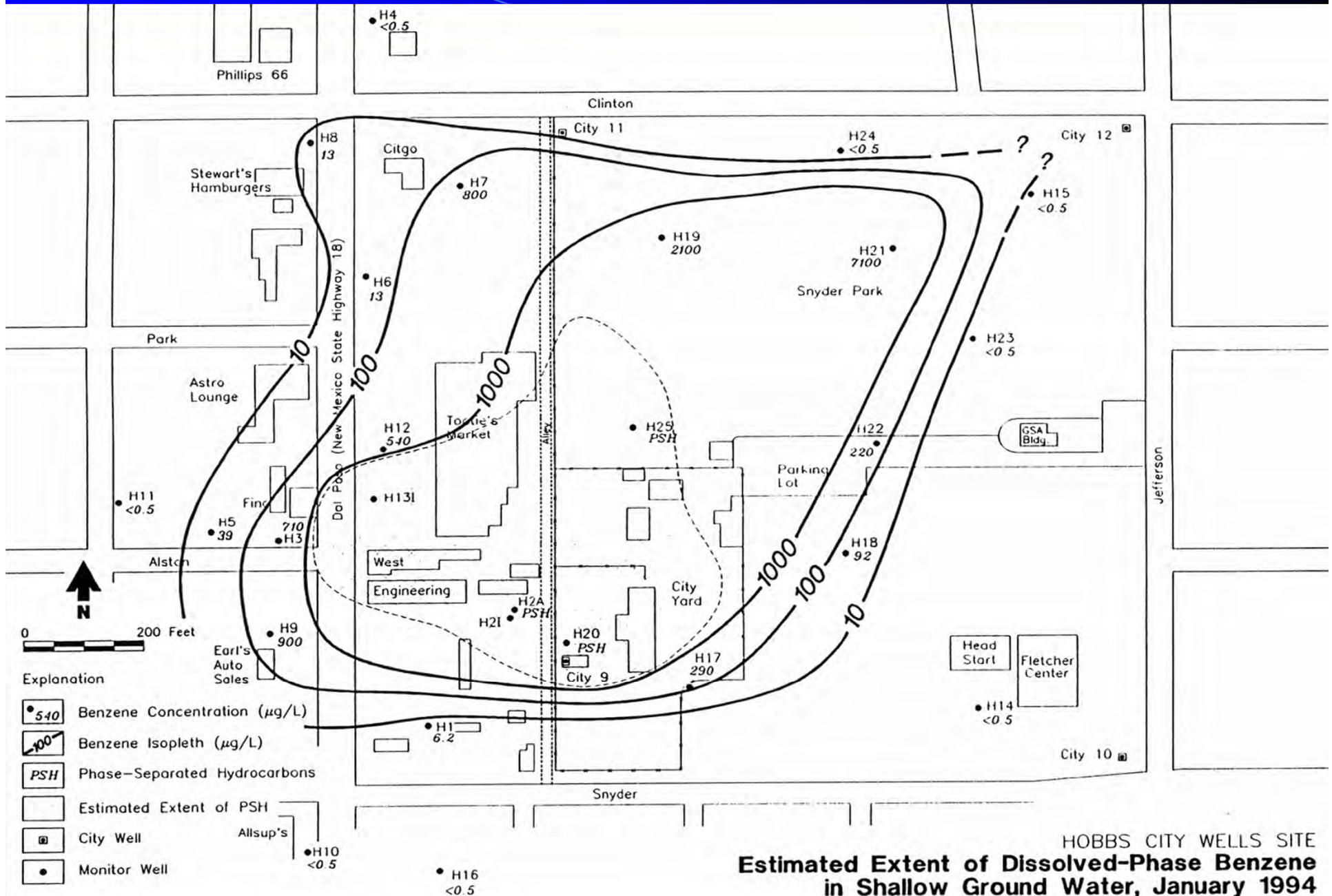
- 25 dual-phase and groundwater recovery wells
- Two independent SVE systems consisting of 63 vapor extraction wells
- Air stripper tower
- Two 1,300 cfm blowers

Site Groundwater Elevations



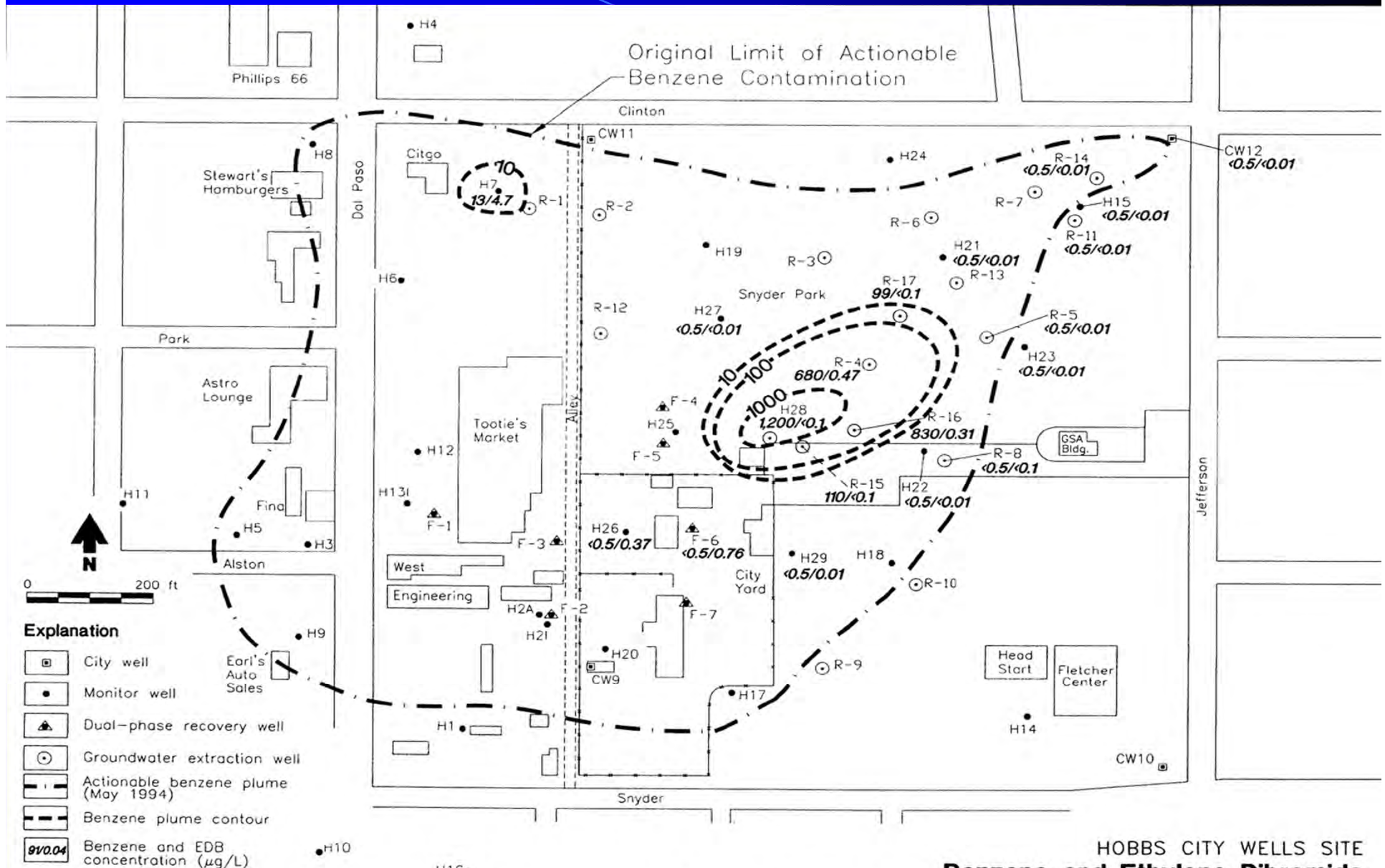
- Explanation**
- City well
 - Fence or block wall
 - Monitor well
 - Dual-phase recovery well
 - Groundwater extraction well
 - Groundwater flow direction
 - Potentiometric surface elevation contour (ft msl) (dashed where inferred)

Contaminant Plume Initial



HOBBS CITY WELLS SITE
**Estimated Extent of Dissolved-Phase Benzene
 in Shallow Ground Water, January 1994**

Contaminant Plume after 6 Yrs



HOBBS CITY WELLS SITE
Benzene and Ethylene Dibromide
Concentrations in Groundwater, February/March 2000

Contaminant Plume after 8 yrs

0.41 acres



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Case History

Burrows Site-Milan, NM

Comparison

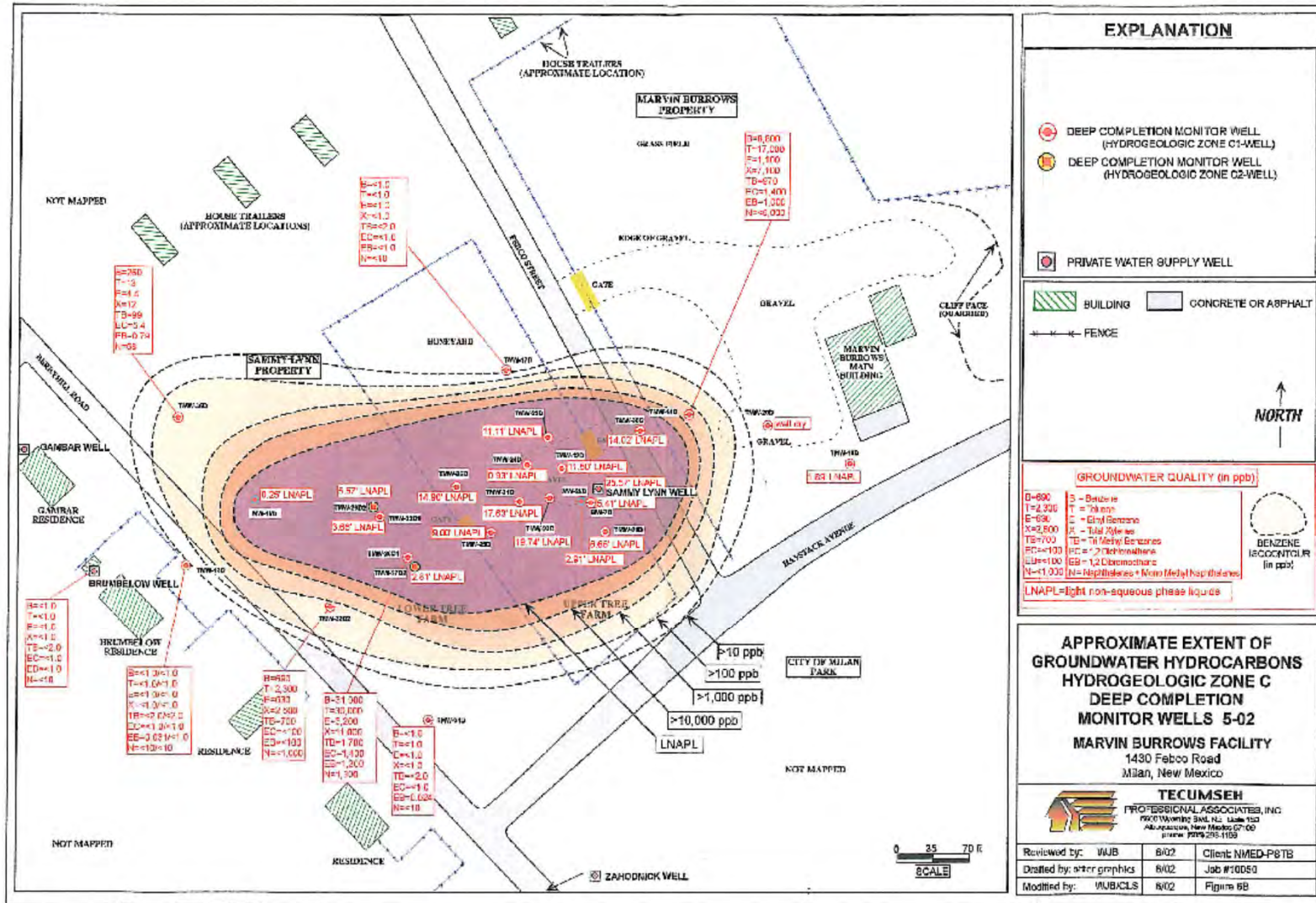
KAFB

- GW Plume 120 acres
- NAPL Plume 55 acres
- Depth to GW ~490' bgs
- Simpler geology

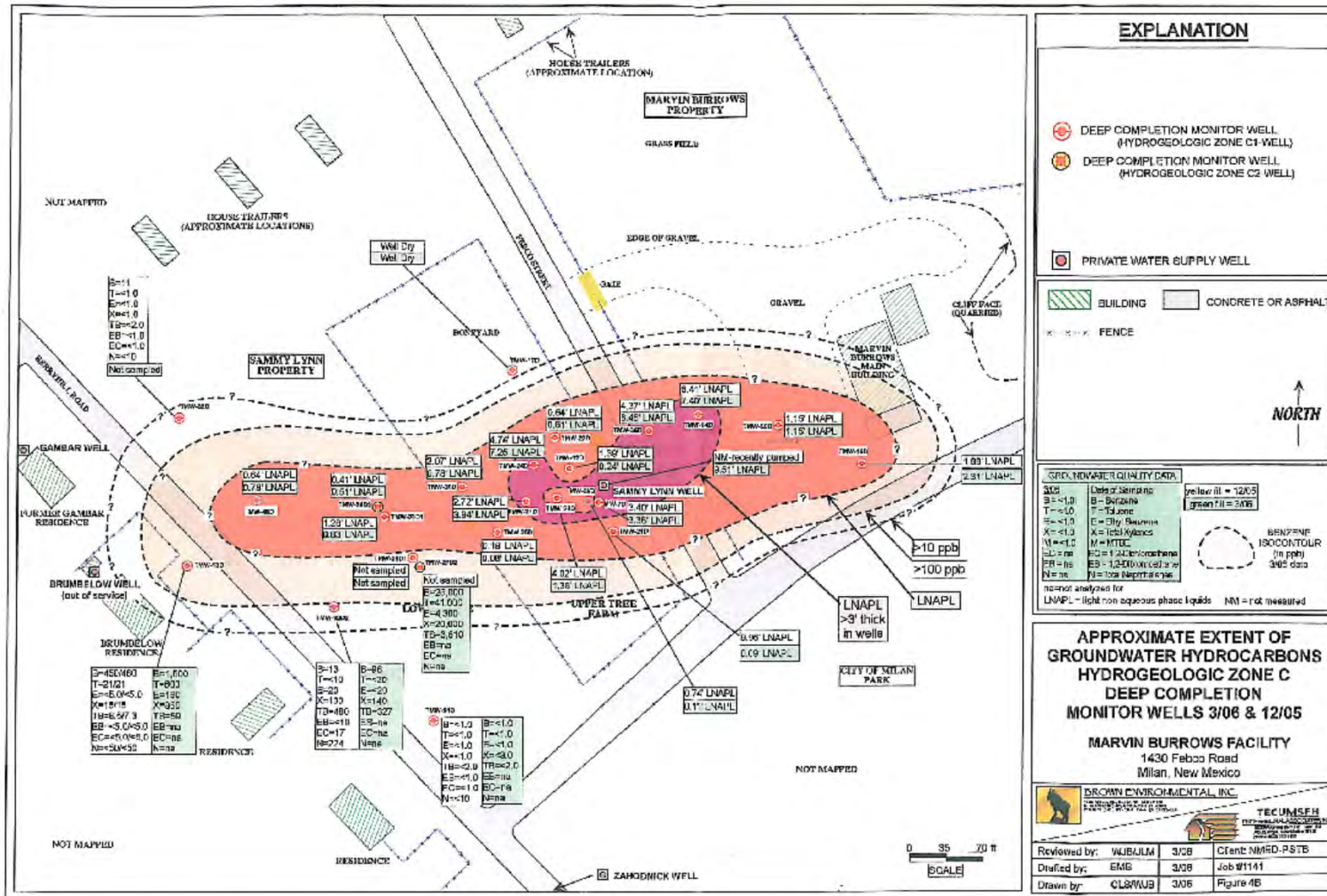
Burrows

- GW Plume 4 acres
- NAPL Plume 2 acres
- Depth to GW ~150' bgs
- Complex geology

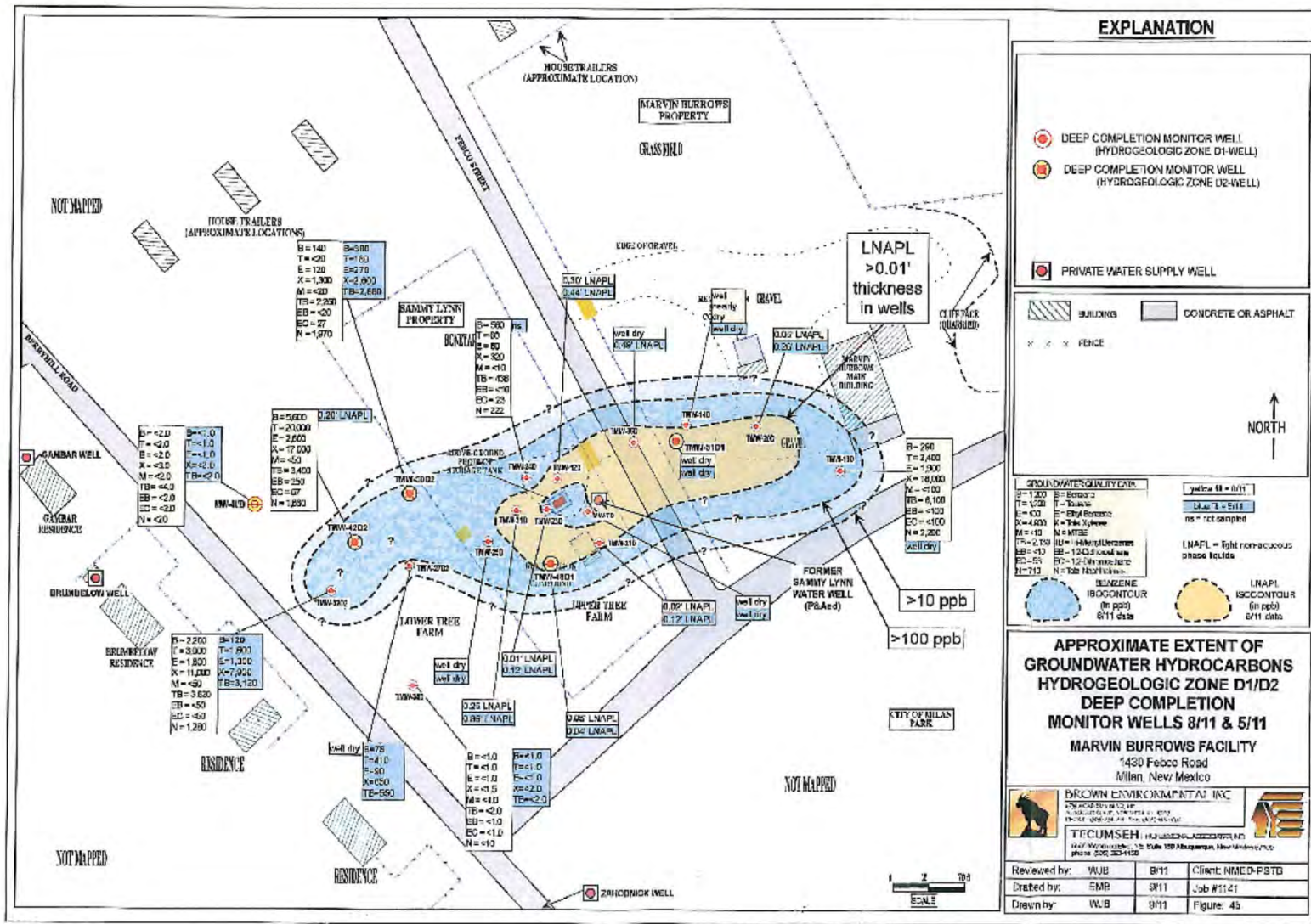
Contaminant Plume-Initial



Contaminant Plume after 4 years



Contaminant Plume Today (11 yrs)









Summary

- Problem is not new
- Remedial technology has/will improve
- Innovative solutions can be applied