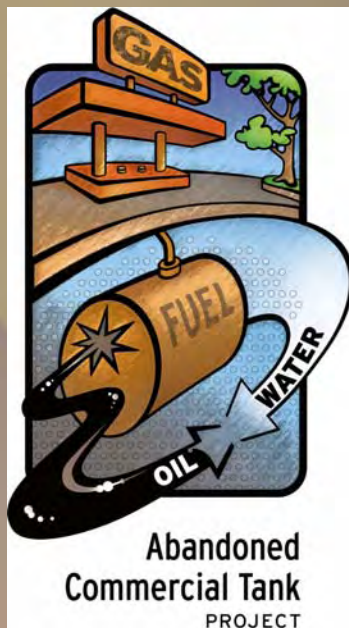


Petroleum Brownfields Management Tools: A Site Inventory Case Study

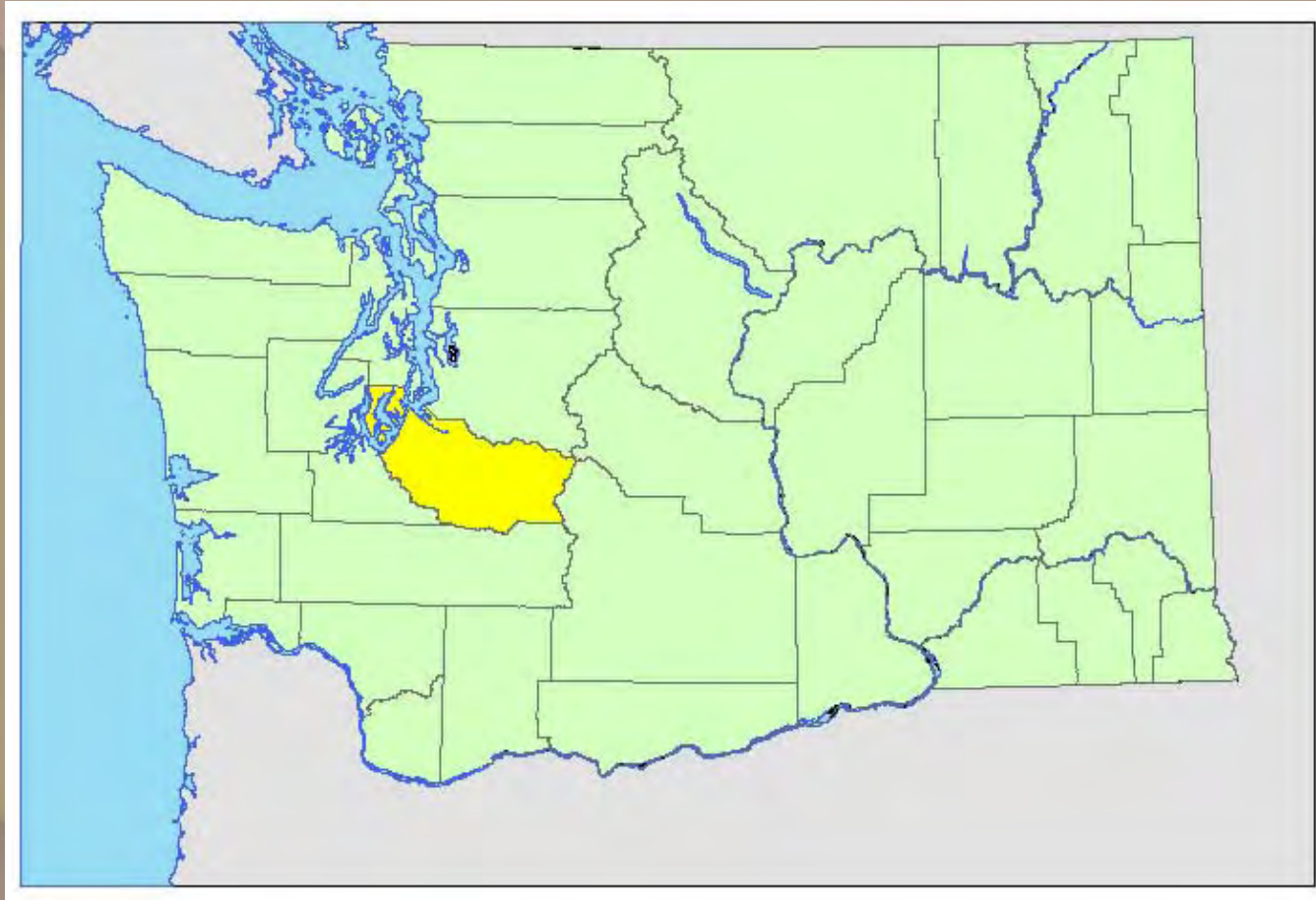


J. Ryan Kellogg, M.A., R.E.H.S.
Tacoma-Pierce County Health Department

17th Annual UST/LUST National Conference
March 15, 2005



Pierce County, Washington



Pierce County, Washington

- Population 730,000, includes City of Tacoma and Mt. Rainier National Park;
- Most of county is EPA-designated Sole Source Aquifer;
- Groundwater is primary drinking water source; and
- UST/LUST Removal Permitting/Oversight program that predates state program.

Gas Stations: Then & Now

2520 Jefferson St., Tacoma

In 1954...



In 2005...



Gas Stations: Then & Now

3800 Pacific Ave., Tacoma

In 1937...



In 2005...



Gas Stations: Then & Now

2523 Pacific Ave., Tacoma

In 1948...



In 2005...



Gas Stations: Then & Now

4801 S. Park Ave., Tacoma

In 1955...



In 2005...



Gas Stations: Then & Now

3640 Pacific Ave., Tacoma

In 1954...



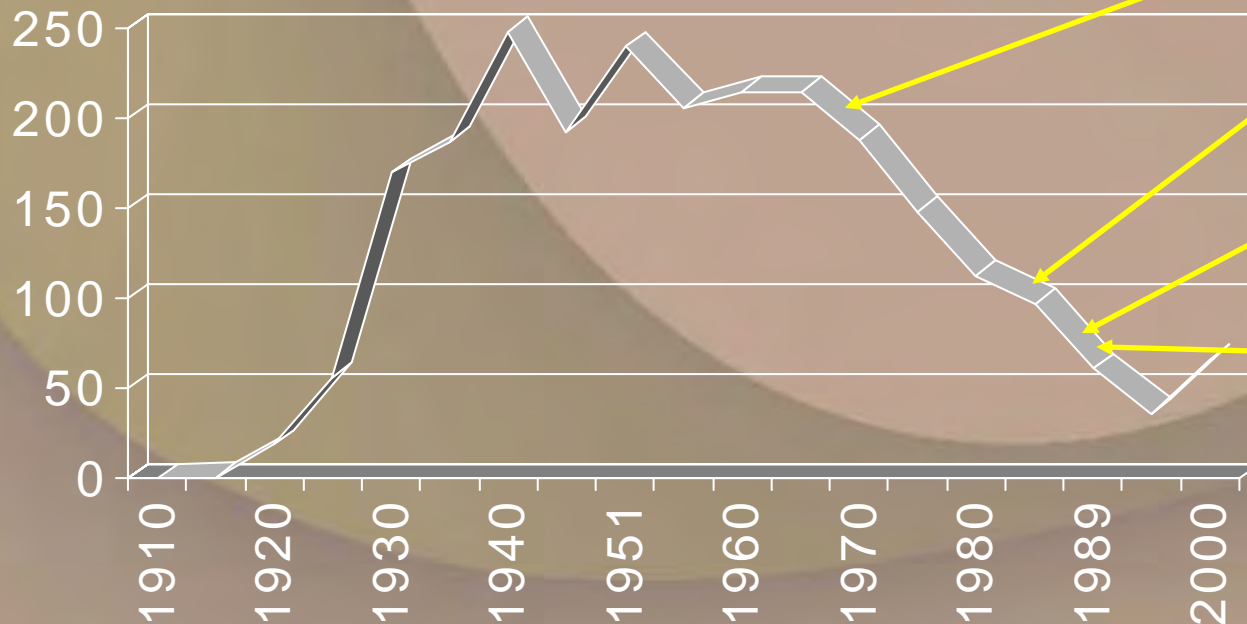
In 2005...



A Century of Growth...

From the “Lean and Many”, to the “Few and Fat”

Tacoma City Directory “Gas Station” Listings



1972: Fire Code Tank Requirements

1984: Federal UST Rules (RCRA Sub. 1)

1988: TPCHD UST Ordinance

1989: State UST Law (WAC 173-360)

What we knew then...

- Gas stations have a 100 year history;
- Until the mid-80's, agency records for underground storage tanks were inconsistent;
- Site identification and cleanup is largely market or release driven;
- Underground storage tanks have a limited lifespan; and,
- Somewhere between 50–75% of older USTs have leaked.

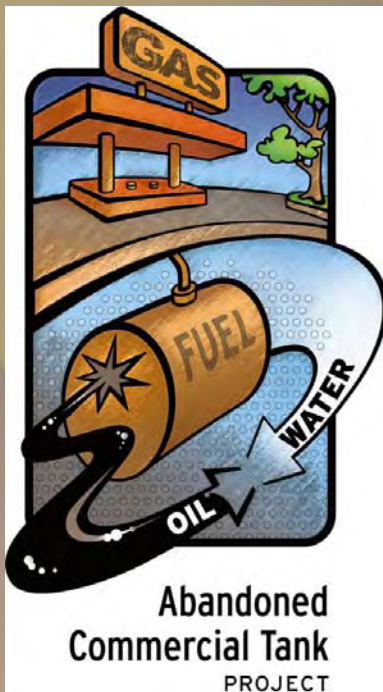


Abandoned Commercial Tank Project (Project ACT)

- Started in 2003;
- Funded by a \$230,000 Site Hazard Assessment Grant from WA Dept. of Ecology.

GOALS AND OBJECTIVES

- Prevention: Assess risk and eliminate contaminant source before release occurs;
- Inventory all former gas station sites and determine compliance history;
- Develop inventory model for neighborhood Brownfields;
- Engage stakeholders early



Stakeholder Involvement

Goals:

- Identify and engage stakeholders early
- Identify opportunities and potential roadblocks
- Communicate department objectives

Objectives:

- Meet with state and local agency staff (EPA, Ecology, Planning and Fire agencies)
- Convened a series of focus groups:
 - ✓ Environmental Professionals (environmental issues and opportunities)
 - ✓ Agency Staff (regulatory issues and opportunities)
 - ✓ Property Owners (ownership and economic issues and opportunities)

Stakeholder Involvement

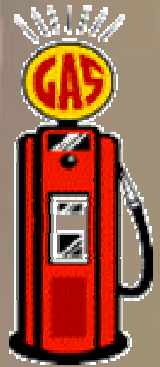
What we learned from property owners:

- Reduce the unknowns:
 - ✓ Environmental: Identify and communicate risks
 - ✓ Government: Understand agency interests, enforcement threshold, and resources for technical assistance
 - ✓ Financial: Identify resources for assessment, cleanup, and redevelopment
- Streamlined permitting will enhance compliance and reduce frustration
- Given a choice, owners want to know about property history

Inventory Development

1. Site Identification

- ✓ Compile historic business listings;
- ✓ Review historic permits & site drawings;
- ✓ Map sites on Geographic Information System (GIS).



2. Compliance Verification

- ✓ Compile current regulated facility data;
- ✓ Map on GIS;
- ✓ Reconcile historic and current facility data;
- ✓ Conduct site surveys.

Inventory Development: Site Identification

Commonwealth Title Insurance Co.

TITLE INSURANCE - ESCROW SERVICE
TEL. Fullon 3-1476

W. R. RUST BLDG. TEL. Fullon 3-1476

GAS COMPANIES

WASHINGTON NATURAL GAS CO
3130 S 38th
TELEPHONE GREENFIELD 4-0711

GASES — LIQUEFIED PETROLEUM

SUBURBAN PROPANE GAS CO OF TACOMA 1125 THORNE RD

GASOLINE — WHOLESALE

MOBIL OIL CO 520 EAST D ST
RICHFIELD OIL CORP 1002 EAST D ST
SHELL OIL CO 702 EAST O ST

STANDARD OIL CO OF CALIFORNIA
PETROLEUM PRODUCTS
OFFICE, PLANT, WAREHOUSE
1048 EAST J (TIDE FLATS)
TELEPHONE MARKET 7-1121

GASOLINE STATION EQUIPMENT

EQUIPMENT SUPPLY CO 1701 COMMERCE ST
SHIELDS HARPER & CO 911 PACIFIC AV RM 200
TACOMA DIESEL INJECTION SERVICE 3502 PACIFIC AV

GASOLINE STATION EQUIPMENT — MAINTENANCE

GOLDEN DON SERVICE STATION MAINTENANCE 3004 SOUTH TACOMA WAY

GASOLINE STATIONS

ABRAHAM BUD CHEVRON SERVICE 818 S TACOMA AV
AL & BOB VELTEX SERVICE 3914 CENTER ST
AL'S RICHFIELD 7201 PORTLAND AV
AL'S SEVENTY SIX 5402 PACIFIC AV
ALEXANDER'S TEXACO SERVICE 802 S 36TH ST
AMERICAN OIL SERVICE 3921 S 12TH ST
ANDERSON'S TEXACO 1002 S 11TH ST
ANDY'S SERVICE STATION 4801 S PARK AV
ARNEY'S TEXACO SERVICE 1202 S 38TH ST
ANDY'S SERVICE 4808 PACIFIC AV
BAY STREET SERVICE 1608 BAY ST
BELL'S SERVICE 2714 S 14TH ST
BERNARD'S UNION SERVICE 613 N 1ST ST
BERGEN'S TEXACO SERVICE 3305 S 36TH ST
BERTUCCI & MORRIS 760 MARKET ST
BIG SIX SERVICE, 3826 6th av, Tel SKyline 9-3541
BILL'S UNION SERVICE 851 S 38TH ST
BINGERS SERVICE STATION NO 10 2505 S TACOMA WAY
BINGERS SERVICE STATION NO 11 4802 PACIFIC AV
BINGERS SERVICE STATION NO 10 2920 JEFFERSON AV
BITTERLING ED CHEVRON SERVICE 6801 SOUTH TACOMA WAY
BOB & BILL'S SERVICE STATION 8808 PACIFIC AV
BOB & JACK'S SIGMA SERVICE 4602 N PEARL ST
BOB'S CHEVRON SERVICE 1002 S 38TH ST
BROKLEND TEXACO SERVICE 3102 6TH AV
BROADWAY SERVICE STATION 1536 BROADWAY ST
BROWNIE'S TEXACO SERVICE 1428 PUYALLUP AV
BUD'S NINETEENTH & K STREET SERVICE 3902 SOUTH K ST
BUD'S RICHFIELD SERVICE 1312 NORTH I ST
BURNS SERVICE & GARAGE 716 E 84TH ST
C & E SERVICE 1423 E 36TH ST
CALDWELL'S RICHFIELD SERVICE STATION 4540 PACIFIC AV
CARL'S FINEST ENCO SERV 1023 REGENTS BLVD 1F3
CARL'S TEXACO SERVICE 3224 SOUTH TACOMA WAY
CENTER STREET ENCO SERVICE 4002 CENTER ST
CENTER STREET SERVICE STATION 820 CENTER ST
CHARLIE'S RICHFIELD SERVICE 2315 N PEARL ST
CHET & JACK'S FUEL 1601 E 27TH ST
CHRIS'S CHEVRON STATION 1703 6TH AV
CHUCK'S MOBIL SERVICE 6232 NE 29TH ST
CLARENCE'S RICHFIELD SERVICE 1316 S 36TH ST
CLEVENGER'S TRUCK SERVICE 428 PUYALLUP AV
CLIFF'S FLYING A SERVICE 2630 S 38TH ST
CROSS & DOUGLASS 1222 S 38TH ST
CURT'S FLYING "A" 8310 W 27th at University pl, Tel SKyline 2-7900
DANFORD'S UNION OIL SERVICE STATION 302 PUYALLUP AV
DAVE'S ENCO SERVICE 1232 S 12TH ST
DAVE'S ENCO SERVICE CENTER 3801 S TACOMA AV
DELL'S UNIVERSITY PLACE 460 8301 W 27TH ST (UP)
DENSMORE'S MOBIL SERVICE 3802 S PINE ST
DEPOT SERVICE 3548 PACIFIC AV
DICK'S DOUGLAS STATION 1201 S 36TH ST
DICK'S RICHFIELD 3130 E 11TH ST
DICK'S SHELL SERVICE 6329 PACIFIC AV
DICK'S UNION OIL SERVICE 2724 W PROCTOR ST
DILLS' GED SIGNAL SERVICE 7202 S PARK AV
DON & JOE'S RICHFIELD 3014 CENTER ST
DON'S TEXACO SERVICE 1201 PACIFIC AV
DON'S TIME SERVICE STATION 6247 SOUTH TACOMA WAY
DOTY'S SERVICE STATION 1801 SOUTH K ST
DUNN'S RICHFIELD SERVICE 4835 S YAKIMA AV
EARLY'S TIME SERVICE 3922 PORTLAND AV
ED & MARTY'S RICHFIELD FUEL & OIL SERV 6802 6TH AV
EDWARDS RAY SHELL SERVICE 5602 MC KINLEY AV
ELLIS AUTO SERVICE 5403 S STATE ST
ERIN'S CHEVRON SERVICE 2702 W BRIDGEPORT WAY (UP)
ETICREST SHELL 4911 CENTER ST
FLANERY RICHFIELD SERVICE 1965 S TACOMA WAY
FLOCK MERLE SHELL SERVICE 5729 N 46TH ST
FLOCK MERLE SHELL SERVICE 4001 N PEARL ST
FOLEY'S TEXACO 8016 W 27TH ST (UP)
FOSTER VELTEX STATION 3901 S TACOMA WAY
FRANK'S TEXACO SERVICE 1822 S JACKSON AV
FRED'S CLIPPER SERVICE 1742 JEFFERSON AV
FREEMAN TEXACO 8433 S HODGEM ST
GALLAGHER'S SEVENTY SECOND SERV & SAVE 7051 PACIFIC AV
GATENEY SERVICE 2526 PACIFIC AV
GENE'S SIGNAL SERVICE 2220 E 11TH ST
GEORGE'S MARKETFIELD SERVICE 401 MARKET DR
GESCH'S TED RICHFIELD SERVICE 3801 6TH AV
GIESOM'S SERVICE STATION 1020 DIVISION AV
GLEASON'S RICHFIELD SERVICE 1202 S TACOMA AV
GLENN'S DOUGLAS SERVICE STATION 601 S 38TH ST
GORDON'S SHELL SERVICE 3907 S 12TH ST
GORDON'S RICHFIELD SERVICE 3837 S 12TH ST
GRANDVIEW SERVICE 2550 W GRANDVIEW DR (UP)
HAGLE'S UNION SERVICE 601 N 1ST ST
HAL'S TEXACO SERVICE 4401 6TH AV
HARRISON'S ENCO SERVICE 402 S TACOMA AV
HARRISON'S SERVICE STATION 2112 JEFFERSON AV
HAROLD'S CHEVRON SERVICE 3802 CENTER ST
HAROLD'S SERVICE STATION 1202 S 12th TELEPHONE MARKET 7-4400
HENDERSON'S TIME GAS STATION 3611 CENTER ST
HIGHLAND HILL SERVICE 6101 6TH AV
HILLCREST DOUGLAS SERVICE STATION 3402 PACIFIC AV
HITE'S F M & SONS SHELL SERVICE 820 S 38TH ST
HOLMES PHIL SHELL SERVICE 2923 PACIFIC AV
HOWARD'S SERVICE 2096 PACIFIC AV
HYATT'S UNION SERVICE 2617 6TH AV
J UNION SERVICE STATION 2724 S TACOMA AV
JACK'S OILER SERVICE 3132 W SOUNDVIEW DR (UP)
JACK'S MOBIL SERVICE 5018 CENTER ST
JACK'S RICHFIELD SERVICE 4801 SOUTH M ST
JACK'S VELTEX SERVICE 2602 PORTLAND AV
JARD PETROLEUM INC 1302 PUYALLUP AV
JASON LEE TEXACO SERVICE 8610 6TH AV
JERRY'S ENCO SERVICE CENTER 6603 SOUTH TACOMA WAY

QUICKER COPIES with



Thermo-fax
Copying Products



610 S. Tacoma Ave.
Fullon 3-5446

U The Alphabetical Section to get Complete Information on a person or firm.

Polk City Directories

- Scanned "Gas Station" listings at 5-year interval
- Used optical character recognition (OCR) to convert listings to Excel spreadsheet
- Mapped addresses on GIS

Inventory Development: Site Identification

CITY OF TACOMA
OFFICE OF CITY ENGINEER

Nº 83 **OIL AND GASOLINE TANK CLEARANCE**

Date 12-17-47 1934

This certifies that the above described oil and gasoline tank and appurtenances
has this date filed in this office plans for the above described tank and appurtenances
to be located

ZONE R 2

ADDRESS 2520 No Alder PLAN FILE C.O. DATE

BOND NOT FILED	PERMIT		NATURE OF PERMIT	INSPECTIONS		
	DATE	NO.		ROUGH FORMS	FRAME	FINAL
Bond filed	12-17-47	3543	Bldg. Service station \$17,000	OK	OK	4-26-48 ET
<u>OK</u>	5-20-70	B 34965	BLDG: Exterior remodel TV Texaco			12-21-70
<u>OK</u>	9-27-72	B 42263	BLDG: D/F ill. plex sign on existing base and pole Texaco			10-12-72

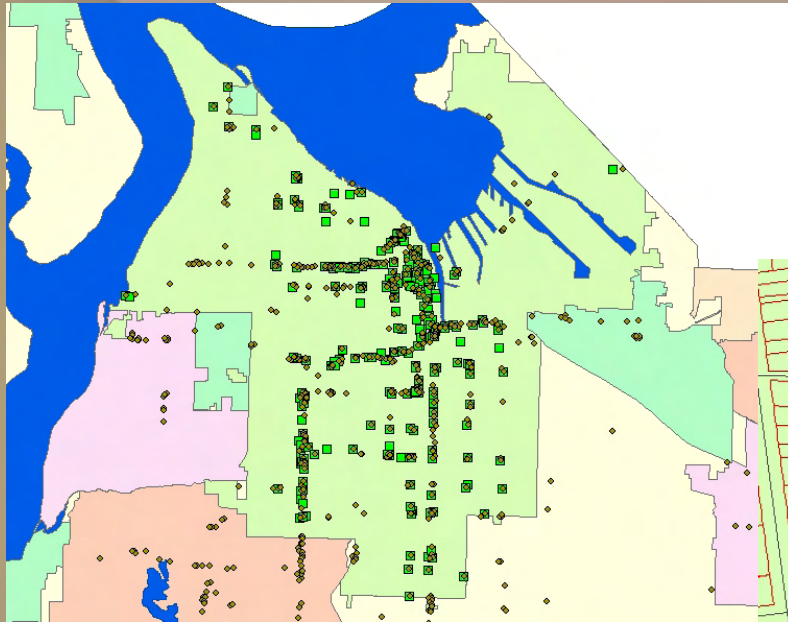
NOTE - I
Said permit shall
located on any s

Other Sources

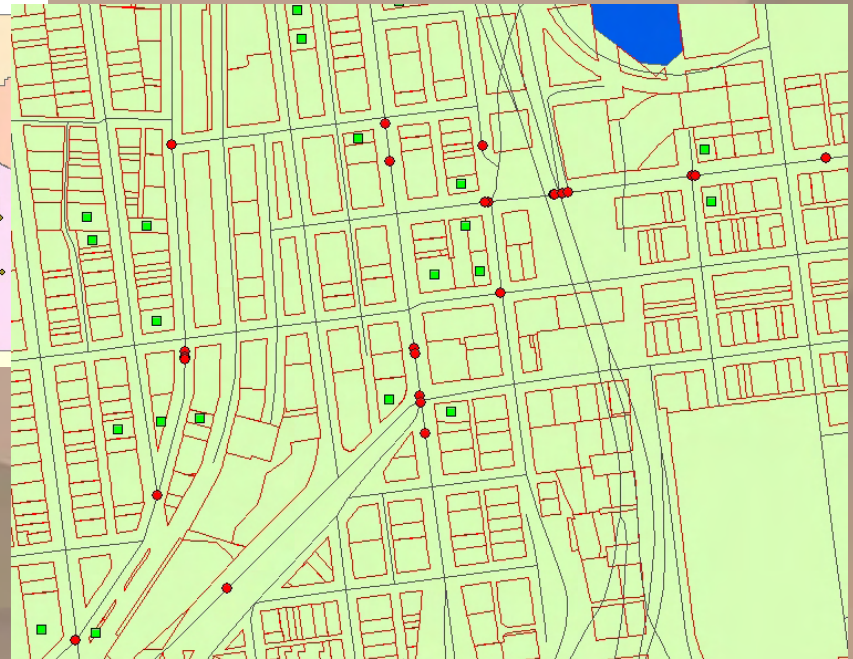
- Tacoma Gas Station “Clearances”
- Historic Inspection Records
- Photos index – Tacoma Public Library (indexed by subject and address)



Inventory Development: Site Identification



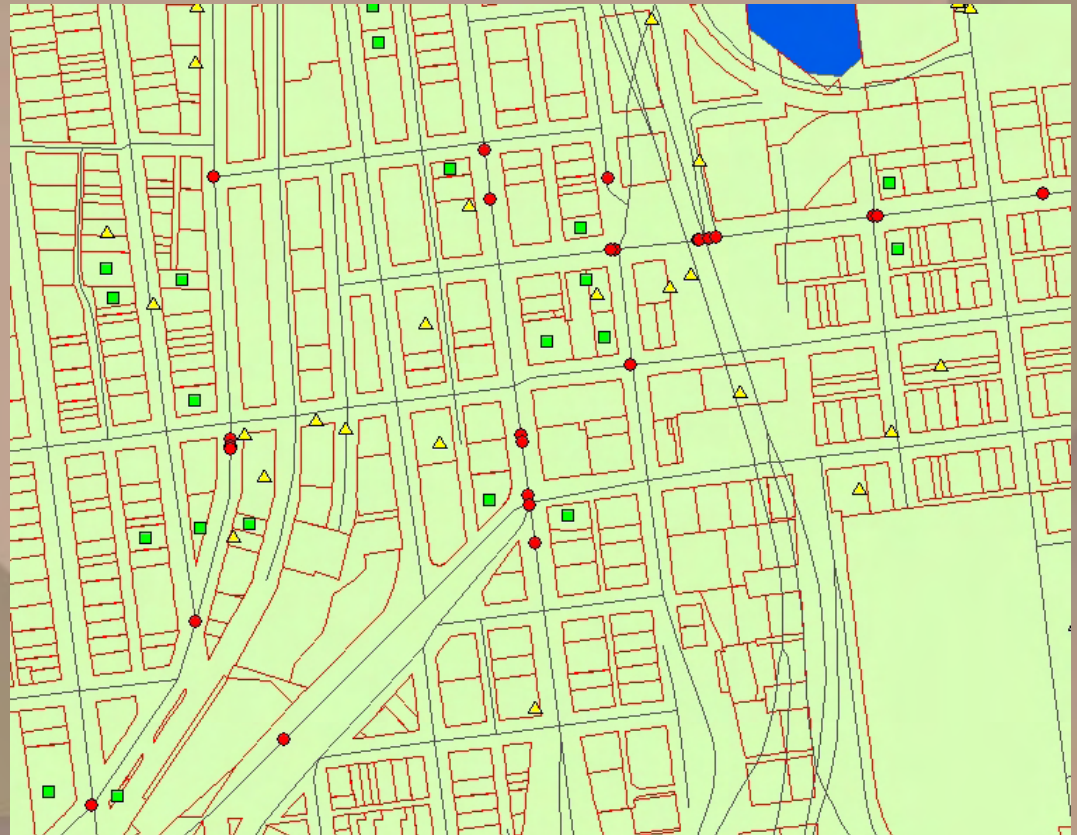
Geocoded City Directory and
Historic UST Clearances



Inventory Development

Add state cleanup and UST site data:

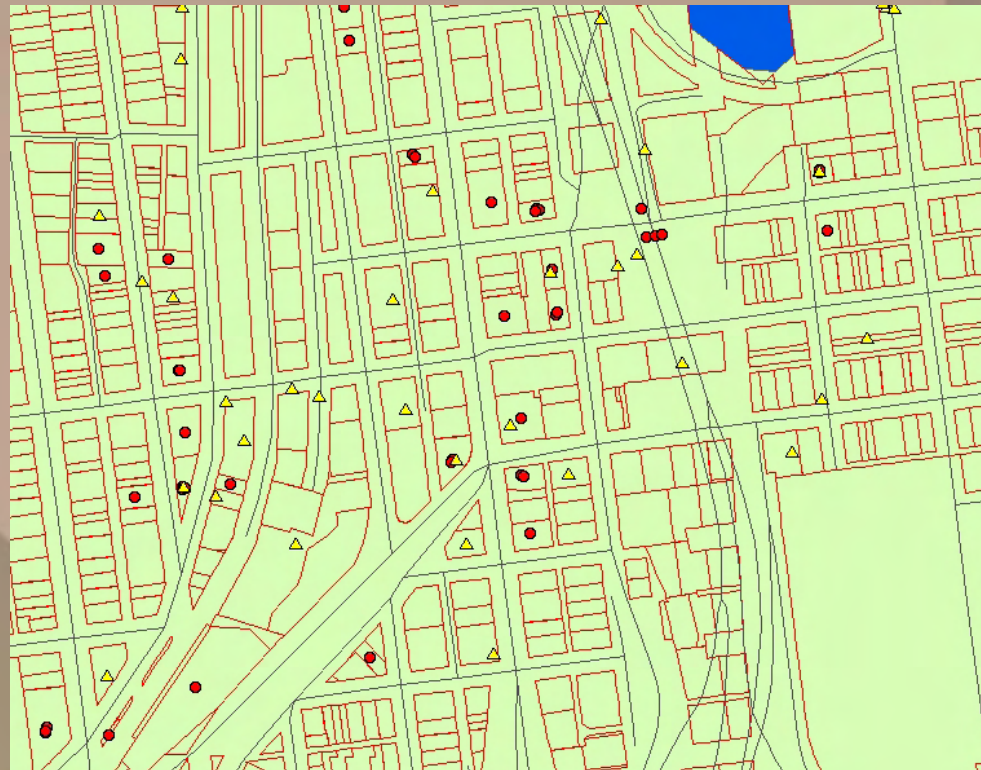
- Existing Stations/UST Permits
- State/VCP Cleanup Sites
- TPCHD UST Removal Permit Sites



Inventory Development

Initial GIS QA/QC – Data point corrections

- Relocated data points where facility address matched parcel address
- Identified survey sites (sites without State cleanup site data)



Inventory Development: Site Surveys

425 surveys conducted at sites without current agency records:

- ✓ Corrected/verified facility location;
- ✓ Noted indicators of former gas station (building/site design; vent pipes, fuel islands, etc.);
- ✓ Assessed redevelopment status; and,
- ✓ Surveyed rural areas not covered by City Directories.

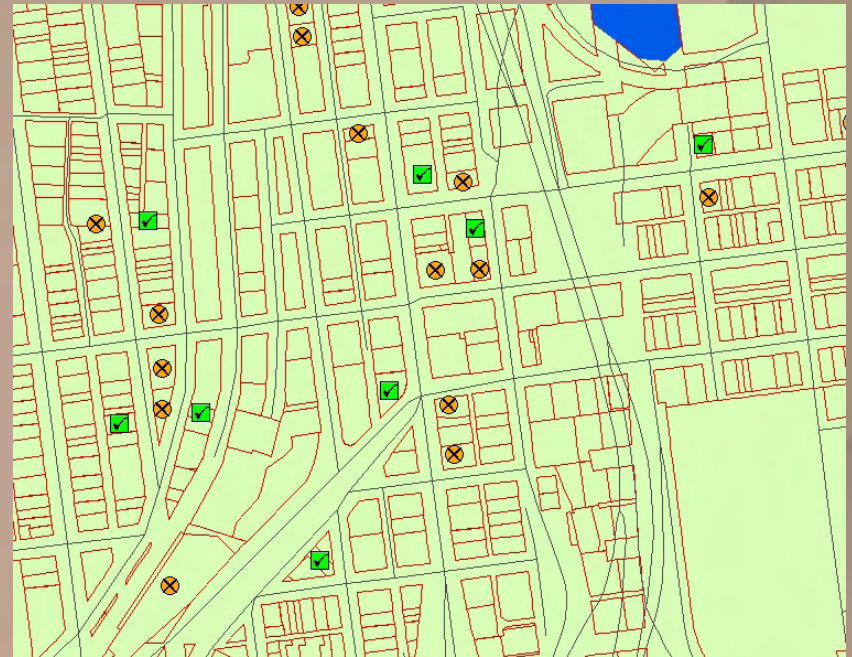
Project ACT: The Final Inventory...

Included on inventory:

- NO state cleanup records and NO redevelopment; or
- Cleanups not completed

Not included on inventory:

- NO state cleanup records and YES redevelopment; or
- Cleanup completed



What we learned...

Findings:

- 742 former gas station sites countywide;
- 370 do not have a compliance history with Department of Ecology or TPCHD (50%);
- 271 have not been redeveloped; 33 redevelopment status unknown;
- 61 have visible indications of distribution system (vent pipes, fuel islands, fill pipes);
- Sites mostly located in commercial neighborhoods surrounding DT cores; and,
- Sites are located in areas with higher unemployment, poverty rates, and minority populations.

Project ACT Inventory

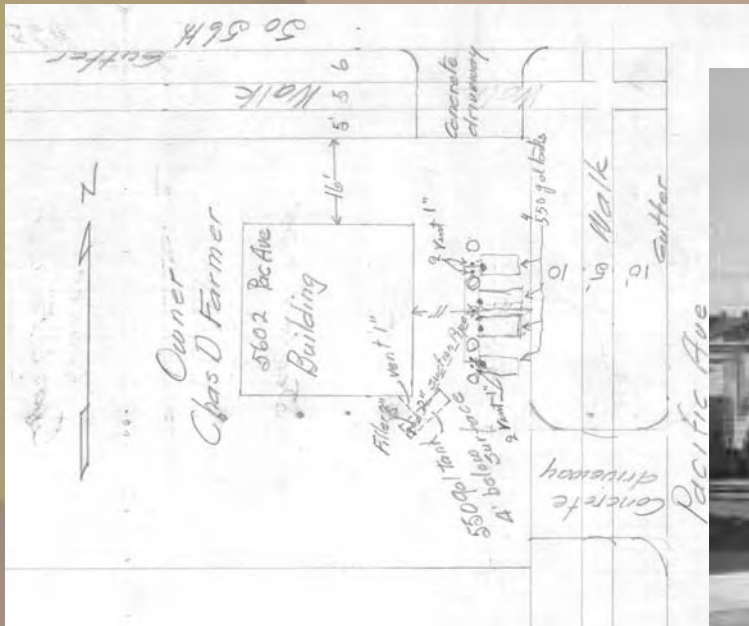
Comparing demographics of areas with high concentrations of former gas stations...

	Census tracts with low site density (0-4 former stations)	Census tracts with high site density (5+ former stations)
Percent of all former stations	12.4%	87.6%
Racial minority	18.7%	27.8%
Hispanic	4.7%	7.2%
Poverty	8.0%	14.8%
Unemployment	7.6%	11.5%

Source: US Census, 2000

Example ACT Site: 56th & Pacific

1923-1968: Operating gas station



Chas Farmer Service Station
5602 Pacific Ave., Tacoma
(c1925)
Site Drawing



Motor Inn Service Station
5602 Pacific Ave., Tacoma
(1947)
Richards Studio Collection
Tacoma Public Library

Example ACT Site: 56th & Pacific

1968: Last City Directory listing

1975: Station Demolished

INSPECTION RECORD			ZONE C-2		
ADDRESS 5602 Pacific Avenue			PLAN FILE		C.O. DATE
PERMIT		NATURE OF PERMIT	INSPECTIONS		
DATE	NO.		ROUGH FORMS	FRAME	FINAL
1-2-23	14	BLDG: Gas station			
2-11-24	384	BLDG: Add'n to service station			
6-23-24	2031	BLDG: Garage			
8-1-28	304	BLDG: Addition			
8-16-28	445	SIGN: Neon (Richfield Oil Co.)			
7-19-46	9375	BLDG: Alter residence in service station \$500			
10-29-47	3223	BLDG: Service station \$9000	FTGS. OK		
5-19-49	7390	BLDG: Alter service station \$1500			
9-23-55	5364	BLDG: Complete service station alterations Building on footings that were built under old permit.			
3-30-56	B 2550	PLBG: 3 toilets, 3 basins, 3 floor drains, 1 water heater, 1 drinking fountain.			
6-16-75	E 50450	BLDG: Demolish service station			7-2-75

STANDARD STATIONS INC (BR) 105 NORTH 1 ST
 STEVENSON'S SIXTY SIX 1101 S SPRAGUE AV
 SWANK EVERETT CHEVRON 1002 S 38TH ST
 SWANSON'S LEE SERVICE 3535 PORTLAND AV
 TACOMA AVENUE AUTO SERVICE 2105 TACOMA AV S
 TACOMA MALL GULF STATION 2631 S 38TH ST
 TACOMA MALL UNION SERVICE 2402 S 38TH ST
 TACOMA SHELL SERVICE 2523 PACIFIC AV
 TED'S OIL SERVICE 3602 6TH AV
 TED'S RICHFIELD SERVICE 1222 S 38TH ST
 TEXACO MOTOR INN SERVICE 5602 PACIFIC AV
 THIRTY-EIGHT ST SHELL SERV 3213 S 38TH ST
 THOMPSON'S SHELL SERVICE 6232 SOUTH TACOMA WAY
 THORNHILL OIL CO INC 1106 ST RAILWAY
 TODDHAVEN SERVICE 4225 E 11TH ST
 TOM'S DOUGLAS STATION 3851 CENTER ST
 TOMMY'S SERVICE STATION 2601 N STEVENS ST
 TONY'S CHEVRON STATION 2923 N 24TH ST
 TONY'S ENCO 1423 E 56TH ST

MOVING
 STORAGE
 TACOMA
 PHONE
 Broadway
 2-3131

Example ACT Site: 56th & Pacific

2004: Agency cleanup records not located,
site added to Project ACT Inventory...



Example ACT Site: 56th & Pacific

2005: Extensive contamination found during redevelopment ...



What we're planning next...

(January – June 2005)

Prioritize sites:

1. Work with local economic development and health department prevention priority staff to identify sites where environmental sensitivity, environmental justice, and redevelopment potential overlap;
2. Identify public sites eligible for assessment and/or cleanup grants;
3. Identify sites with high environmental priority (evidence of tank presence, station longevity, location in a wellhead protection zone, etc).

What we're planning next...

(Longer Term)

- Help coordinate technical and financial assistance to property owners – all sites are different;
- Continue to assess public health role in promoting neighborhood Brownfields redevelopment;
- Evaluate inventory methodology and apply to other historic business types; and
- Implement Pilot Neighborhood Brownfields Program.

A Brownfields Primer...

- Brownfields recently redefined to include petroleum sites;
- Grants and loans available to public agencies for inventory, assessment and cleanup;
- Low interest loans available to (non-liable) private parties for assessment and cleanup; and
- Leverages environmental public health goals by promoting cleanup and economic development together

TPCHD Neighborhood Brownfields Project

- \$200,000 EPA Grant
- January 2005 – September 2006
- Three main objectives:

Objective 1. Conduct environmental assessments on 5-10 sites:

- ✓ Site selection in next six months; and
- ✓ Based on community interest, economic development potential, environmental justice; and environmental benefits.

TPCHD Neighborhood Brownfields Project

Objective 2. “Neighborhood Advisory Board for Redevelopment”

- ✓ Representatives from affected community, business leaders, developers, lenders, economic development and environmental agency staff;
- ✓ Advocates for, and supports assessment and redevelopment of sites selected in first phase; and,
- ✓ Makes policy recommendations for expediting assessment, cleanup and redevelopment of other neighborhood sites.

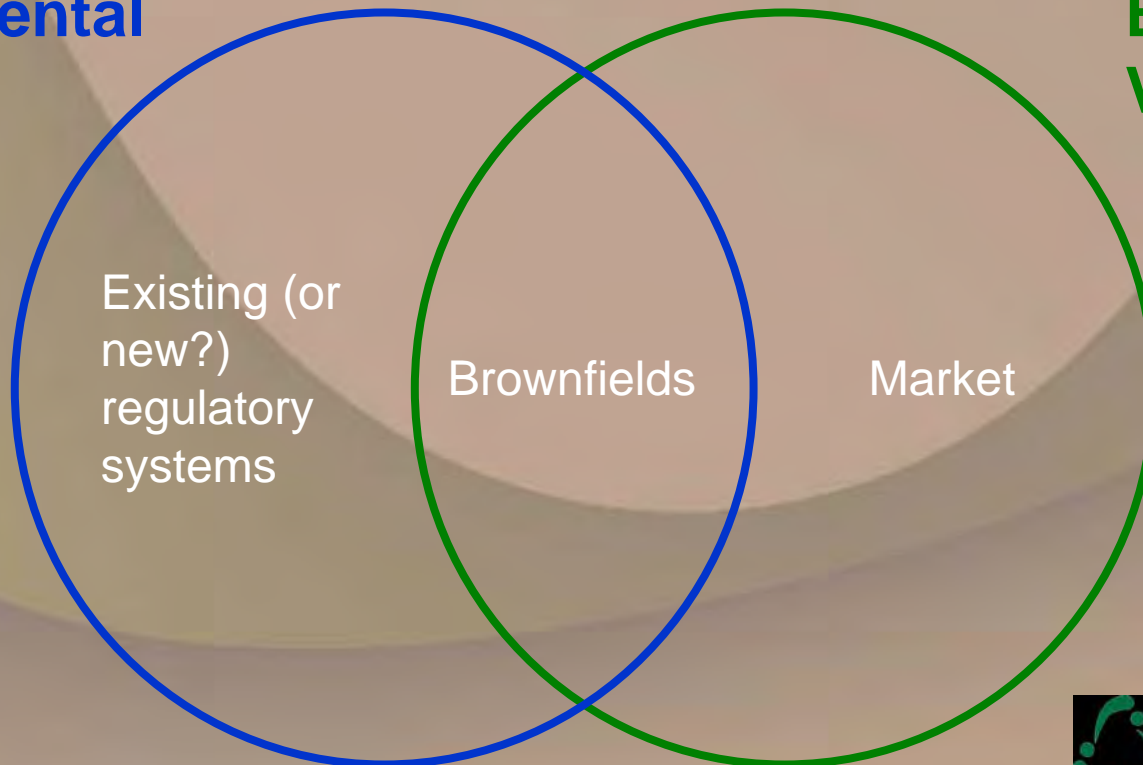
Objective 3. Leverage partnerships and additional funding for site cleanup and redevelopment.

Putting Brownfields in Context

Project ACT Sites

**Environmental
Priority**

**Economic
Viability**



Putting Brownfields in Context



Jobs and a healthy environment don't need to be mutually exclusive...

Want more information?

Brownfields Information & Programs

Abandoned Commercial Tank Project

www.oldtanks.info

Brownfields Communities Network

www.nalgep.org/issues/brownfields/

EPA Brownfields Program

www.epa.gov/swerosps/bf/index.html

L.A. Brownfields Program

www.lacity.org/EAD/labf/

NACCHO Brownfields Page

www.naccho.org/project57.cfm

Thank You!

Tacoma-Pierce County Health Department

Abandoned Commercial Tank and Neighborhood Brownfields Projects

For more information:

J. Ryan Kellogg, M.A., R.E.H.S.

(253) 798-4784

rkellogg@tpchd.org

<http://www.oldtanks.info>

