



Welcome to the CLU-IN Internet Seminar

Implementation of Triad for Petroleum Brownfield's Cleanup and Reuse
Sponsored by: US EPA Technology Innovation and Field Services Division
Delivered: January 26, 2010, 12:00 PM - 1:30 PM, EST (17:00-18:30 GMT)

Instructors:

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Moderator:

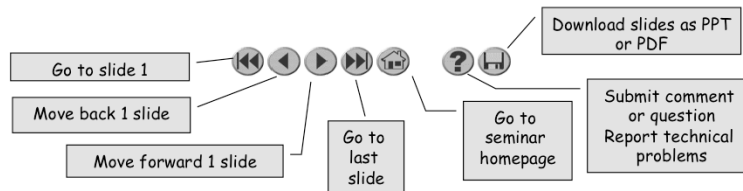
Michael Adam, US EPA Technology Innovation and Field Services Division (adam.michael@epa.gov)

Visit the Clean Up Information Network online at www.cluin.org

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Housekeeping

- Please mute your phone lines, Do NOT put this call on hold
 - press *6 to mute #6 to unmute your lines at anytime
- Q&A
- Turn off any pop-up blockers
- Move through slides using # links on left or buttons



- This event is being recorded
- Archives accessed for free <http://clu.in.org/live/archive/>

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Although I'm sure that some of you have these rules memorized from previous CLU-IN events, let's run through them quickly for our new participants.

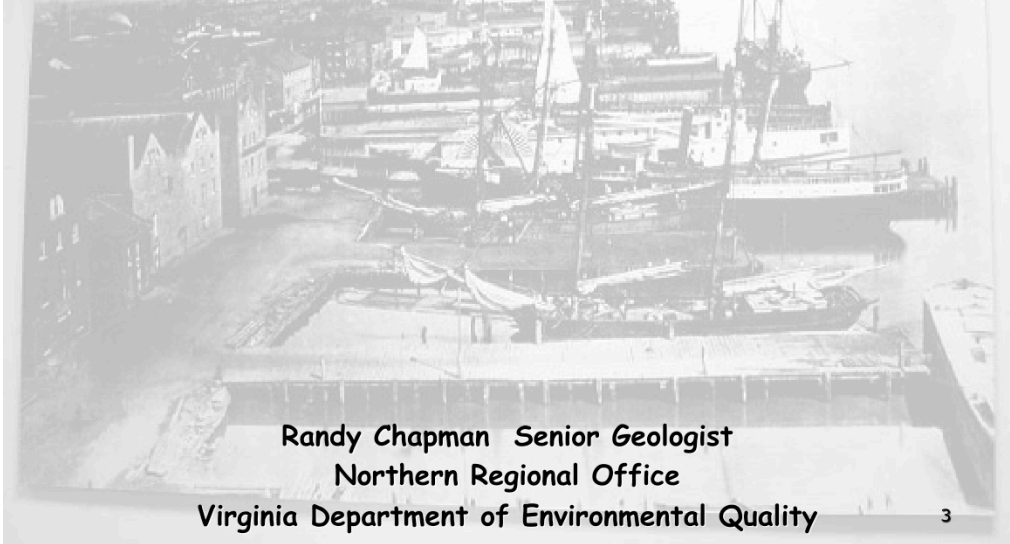
Please mute your phone lines during the seminar to minimize disruption and background noise. If you do not have a mute button, press *6 to mute #6 to unmute your lines at anytime. Also, please do NOT put this call on hold as this may bring delightful, but unwanted background music over the lines and interrupt the seminar.

You should note that throughout the seminar, we will ask for your feedback. You do not need to wait for Q&A breaks to ask questions or provide comments. To submit comments/questions and report technical problems, please use the ? Icon at the top of your screen. You can move forward/backward in the slides by using the single arrow buttons (left moves back 1 slide, right moves advances 1 slide). The double arrowed buttons will take you to 1st and last slides respectively. You may also advance to any slide using the numbered links that appear on the left side of your screen. The button with a house icon will take you back to main seminar page which displays our agenda, speaker information, links to the slides and additional resources. Lastly, the button with a computer disc can be used to download and save today's presentation materials.

With that, please move to slide 3.

□

Petroleum Brownfields: Implementation Experience FANNON BULK TERMINAL



Randy Chapman *Senior Geologist*
Northern Regional Office
Virginia Department of Environmental Quality

BROWNFIELDS: TENETS / PREMISE

- **Brownfields Law - revitalization of sites**
- **Enhance public-private partnerships**
- **Identify and convey information regarding common misconceptions and successful approaches associated with their revitalization**
- **Overcome implementation hurdles which impede the revitalization**





Brownfield Restoration and Land Renewal Act

(Code §§ 10.1-1230 through 10.1-1237)

DEQ's Brownfield Program provides a process for non-enforcement containment and clean-up actions, penalty immunity and mitigation in enforcement situations, and limits on liability for certain owners.



Brownfield Restoration and Land Renewal Act

(Code §§ 10.1-1230 through 10.1-1237)

- **Voluntary Remediation Program ("VRP")**
- **Statutory Limited Liability**
- **Limited Liability through Director Determination**
- **Brownfield Amnesty Program for Voluntary Disclosure**



Brownfield Restoration and Land Renewal Act

(Code §§ 10.1-1230 through 10.1-1237)

- **Voluntary Environmental Assessment Immunity**
- **Civil Charge Mitigation For Self-Disclosed Violations**
- **Comfort Letters**
- **EPA Memorandum Of Agreement (CERCLA)**
- **Federal Enforcement Bar**



Brownfield Restoration and Land Renewal Act

(Code §§ 10.1-1230 through 10.1-1237)

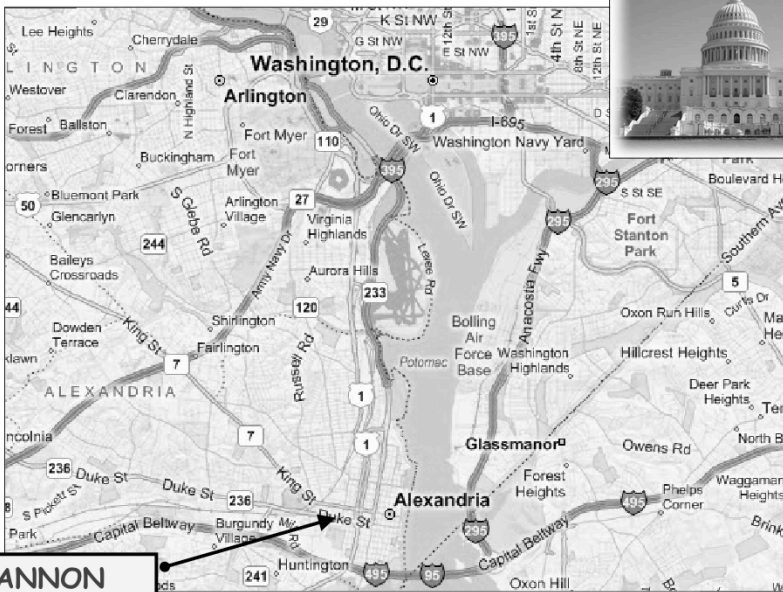
- **Low interest loans for Brownfield cleanups are available through the Virginia DEQ or through the Virginia Resources Authority**
- **Please contact Walter Gills at (804) 698-4130 for assistance**



Brownfield Restoration and Land Renewal Act

(Code §§ 10.1-1230 through 10.1-1237)

- o **However, since this is a petroleum site, we are able to utilize monies from the Virginia Petroleum Storage Tank Fund (VPSTF) for some of the Revitalization, Remediation, and Restoration work.**



**FANNON
PETROLEUM**



- Fuel Depot since late 1800's
- Most recent facility since 1962

- ASTs and USTs
- > 500,000 gallon capacity
- Early 1980's release



THE NEIGHBORHOOD



THE EARLY 80's

Fannon Log

5-6-82 I drove at Fannon with Ed C.
 Inspected the property, looked at site, saw petroleum
 was found in the street several blocks from Fannon.

5-9-82 Spoke with Dave Fannon. Convinced him to bring in a
 truck to do dig detail across driveway to determine if
 any petroleum is in the groundwater.

5-14-82 Trained installed
 1 hr. at Fannon with Ed C.
 They had received the detail in driveway. Saw petroleum
 was observed, but not nearly the quantity seen
 by Ed C. & Guy B. on 5-10-82.

*At the time most contractors' equipment was at
 a stand still. Some they were just lying around
 as a way.*

NDUM
State Water Control Board
 Hamilton Street P. O. Box 11142 Richmond, VA. 23290

CT Fannon Oil Company - PC 82-757

PReP Central
 Steve Crowther *SC*
 August 11, 1982

S: F11a

The following is a summary of events of PC 82-757. This PReP investigation
 was begun by Ed Carlson and later picked up by myself after Ed's resignation.

In May 6, 1982, Ed Carlson and I inspected Fannon Oil Company. In previous
 petroleum had been discovered in a street trench several blocks from
 O11. Ed and I spoke with Mr. Dave Fannon and convinced him that some
 investigation was necessary as to whether or not petroleum was in the groundwater
 property. On May 10, 1982, a trench was installed on the property of
 O11 and petroleum was found to be in the groundwater.

F. Fannon eventually hired a geological consultant to determine the extent
 of contamination. On May 25, 1982, Bill Murray of Johnston and Associates,
 delivered to the SWCB a plan for installation of monitoring wells around
 property of Fannon Oil. By June 15, 1982, construction of these wells was
 nearly completed. Samples were collected by Johnston and Associates on June 21,
 1982, to be analyzed for petroleum type.

On June 30, 1982, Mr. Murray met with Ernie Watkins and myself. At this
 time Ernie expressed the need for actual site clean-up to begin. Mr. Murray
 explained that clean-up could not (should not) begin until all monitoring wells
 are installed and their groundwater study of the property is complete.

On July 27, 1982, I spoke with Mr. Murray. He explained that additional
 monitoring wells were installed on the Fannon property. One of the wells was
 showing as much as 40 inches of petroleum. He stated that in approximately
 two weeks recovery wells would begin to be installed.

PreP
 Period: April 30, 1982 & May 1-2, 1982

- April 30, 1982:**
- 0815 **PIEDMONT REGION:** Virginia Wood Preser
 P82-754 sote at their 2000 Peyton Street, Rich
 cleaned up by company personnel.
 - 0915 **NORTHERN REGION:** Arlington Co. Fire Dept. reported a minor spill (less than 5 gal.)
 P82-755 of unleaded gasoline into a tributary to Four Mile Run. Wayne Chrismore to investi-
 gate.
 - 1150 **WEST CENTRAL REGION:** Received complaint that Hollingsworth and Vane Co. might be
 P82-756 improperly disposing of sewage sludge. SHD notified.
 - 1245 **NORTHERN REGION:** Alexandria Fire Dept. reported that a city work crew had struck
 P82-757 an underground oil line near Cameron Run. Wayne Chrismore to investigate.
 - 1420 **PIEDMONT REGION:** A major train derailment near the James River was reported by
 P82-758 Tim Perry, PRO. Initial investigation revealed no hazardous materials were in-
 volved and no water pollution was occurring--some diesel fuel was spilled.
 Martha Hunter and Pete Trexler on scene Friday night.

THE EARLY 80's

per year is 15-18 million gallons. In one January 3-4 years ago he sold 4 million gallons. They're now selling fuel since 1962 at that rate 1000-2000 gallons of fuel could easily have been lost per year, years ago oil was only .04 a gallon and there were no environmental regulations at all. He feels they may have 50,000 gallons in all & a 2 year recovery project.

5/26/83

Don Downs advised 14,700 gallons recovered as of 5/15 5/25. No decision made on pressure testing gas tanks yet.

6/21/83

Called Dave Fannon. Advised samples collected from ground were negative for blue dye. He advised 15,420 gallons of prod.

Feb 7, 1985 I talked with Don Downs. He advised that they will be putting in a higher volume recovery pump to lower the cone. Recovery has declined to 3 gal hour. They are awaiting warmer weather to facilitate the exchange. I requested they let me know when it occurs so I can be there. As of Jan 15, Fannon has recovered 27,184 gallons of product.

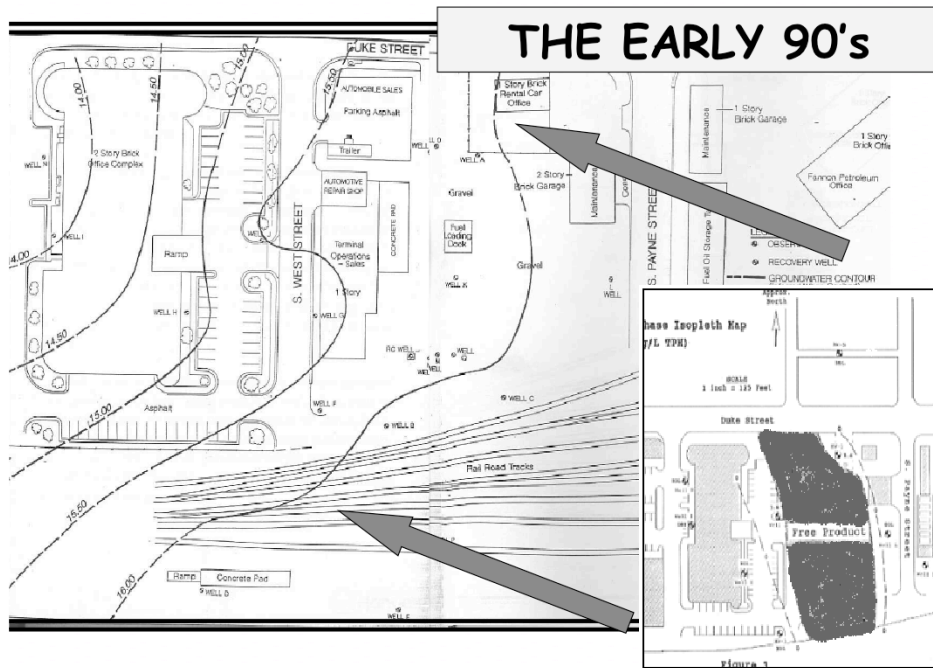
1.25 hrs spent 19 miles on pool car.
 5/21/84 Called Don Downs. As of May 15, 23,737 gallons have been recovered. Harder well logs have been showing a steady decline of product levels.
 9/12/84 26,468 gallons cumulative product recovery. Elevation of recovery rate is higher than well. Harder to clean.

FANNON PETROLEUM
 1200 DUKE STREET
 ALEXANDRIA, VIRGINIA
 TANK INVENTORY

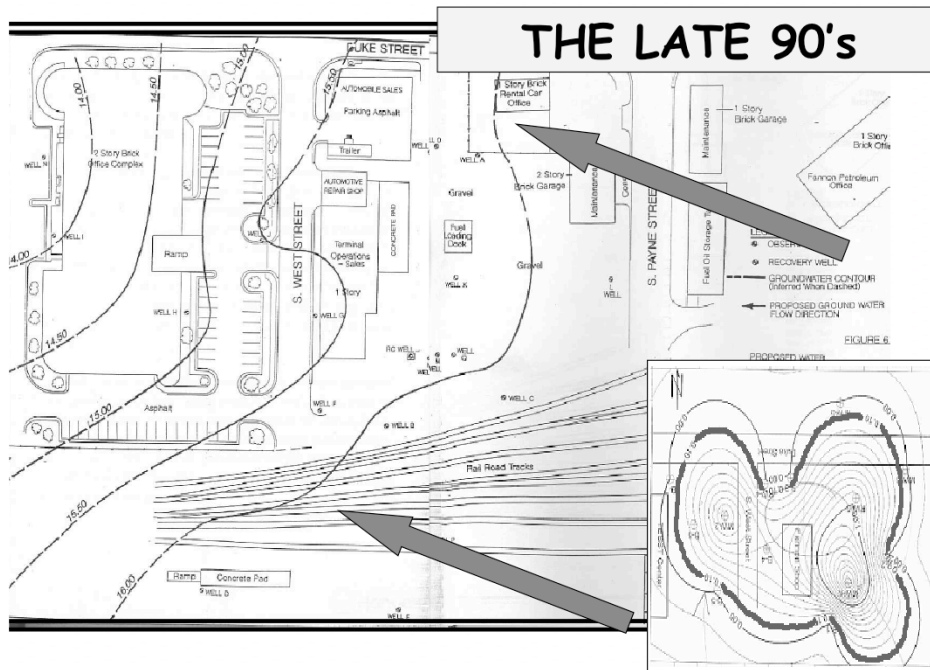
Number of Tanks	Above (AG) or Below (BG) Ground	Tank size Gallons	Contents
7	AG	18,000	Kerosene
10	BG	30,000	Fuel Oil
6	BG	8,000	Motor Oil
1	BG	30,000	Ethanol
2	BG	20,000	Regular Unleaded Gasoline
1	BG	2,000	Kerosene
1	BG	2,000	Diesel
1	BG	10,000	Methanol
1	BG	2,000	89 Octane Unleaded Gas
1	BG	4,000	89 Octane Unleaded Gas
1	BG	4,000	Super Unleaded Gasoline
TOTAL: TANK NUMBER AND VOLUME			
32		588,000	

INITIAL ASSESSMENT



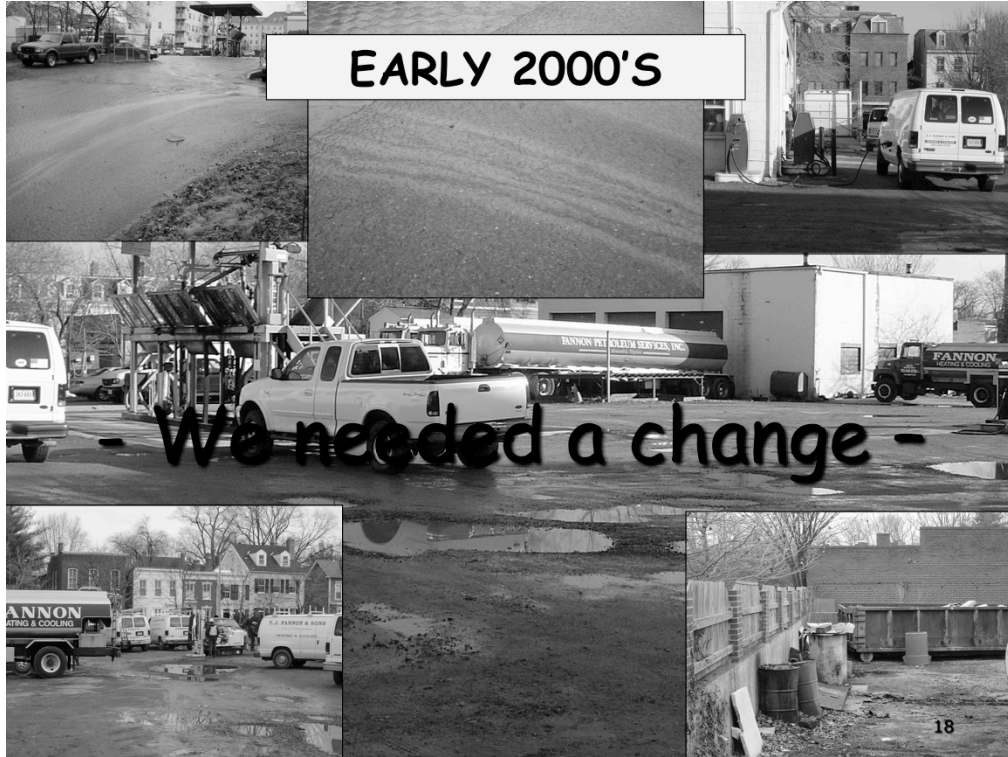


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EARLY 2000'S

We needed a change -



THE NEEDS

- Needed to define extent and severity of plume with high confidence.
- Needed to identify all problem areas that required remediation.
- Needed to know what would be left behind.
- Needed concurrence / acceptance from affected parties (City, Owners, Citizens).
- Needed to address RISK.
- We looked to our needs for solutions

THE SOLUTION

We found it in the form of...

- Membrane Interface Probe
- TRIAD Philosophy
- Redevelopment



Columbia Technologies - SmartData Client Login - Microsoft Internet Explorer

Friday, March 31, 2006

Client Login

SmartData Solutions™


News: 1/23/2006
SmartData Solutions version 4.0 from Columbia Technologies is now available. This state-of-the-art information processing package includes all elements needed for the fastest, most reliable maps of underground contamination that saves our clients money.

Included in SmartData Solution: Customer services. We strive to provide all our customers with the best service possible. If you

Resources: For the latest information on MIP technology, visit SmartData University. Consult the latest white papers (pdf files).

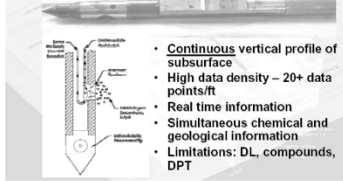
White papers

MIP SURVEY



Fax: 410-536-0222
Email: info@columbiatechnologies.com
Not Tiller: ettillerc@columbiatechnologies.com
John Sohi: jsuhi@columbiatechnologies.com

Membrane Interface Probe



- Continuous vertical profile of subsurface
- High data density – 20+ data points/ft
- Real time information
- Simultaneous chemical and geological information
- Limitations: DL, compounds, DPT

COLUMBIA Technologies

SmartData Solutions for the Environment®

- Real Time mapping of underground environmental contamination
- Easy to understand reports and 3D visualization packages
- Faster and better informed decisions for site management

SmartData Solutions® by Columbia Technologies delivers high quality 3D maps of underground contamination to your computer daily while in the field permitting the environmental professional to make better, cost-effective decisions quickly and easily.

SmartData Solutions® from Columbia Technologies is like an "underground MRI" and offers environmental consultants and property owners several benefits not possible with other technologies:

- **Faster and better informed decisions** about site characterization, risk assessment and cleanup design as data results are provided in hours, not weeks later
- **Lowers the costs dramatically** for property transfers, site cleanup, and insurance underwriting

TRIAD APPROACH

Triad Requirements - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites Media
Address http://www.triadcenter.org/reqm/req/index.cfm
Google Triad approach

Triad Resource Center
TRIAD: A SMARTER SOLUTION TO SITE CLEANUP
Triad Overview Triad Management Regulatory Information Technical Components
Home Triad Management Triad Requirements

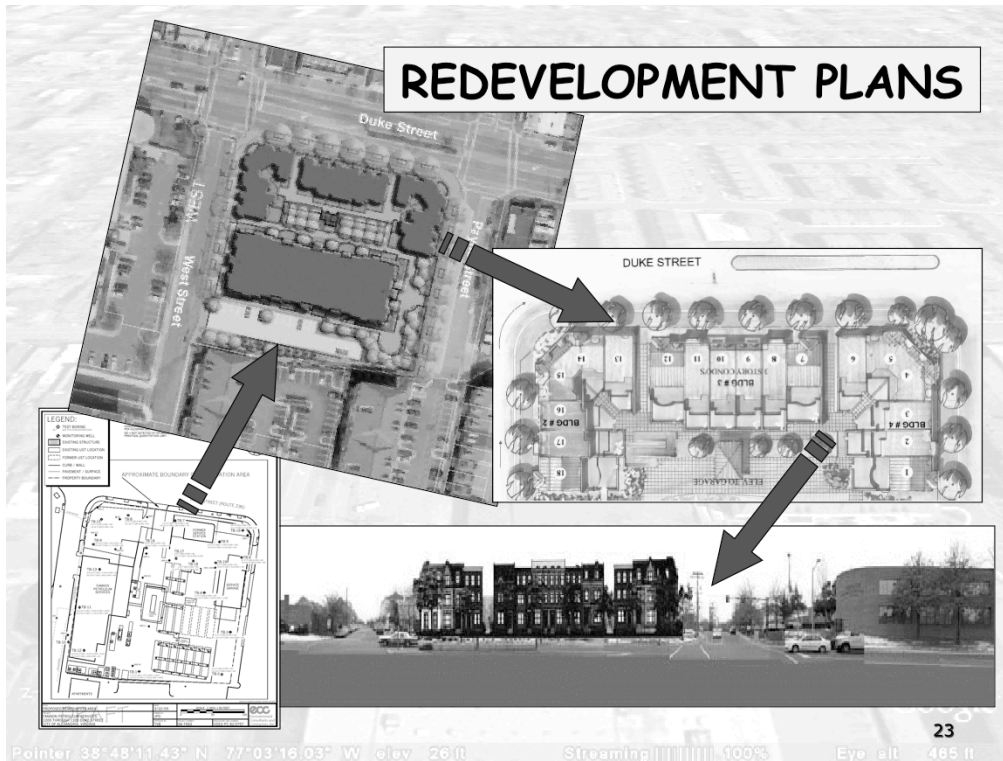
Triad Requirements
There are a number of requirements (e.g., appropriate participation, flexible contracting mechanisms) successful Triad implementation.
The purpose of this section is to introduce the various successful deployment of the Triad. Many of these detail in subsequent sections. These are all items a looking for when implementing a Triad approach. Not not absolute in all cases for a site to experience at Triad approach. For example, collaborative data set decisions at reduced costs over if real-time measurement work strategies are not included. Likewise, systems essential component for all hazardous waste site or collaborative data sets, real-time measurement systems strategies are used or not.

City of Alexandria, VA | Homepage - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites Media
Address http://www.cityofalexandria.com/alexandria
Google City of Alexandria VA

Fannon Petroleum Services, Inc. - Microsoft Internet Explorer
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Back Forward Stop Refresh Home Search Favorites Media
Address http://www.fannonpetroleum.com/about.asp
Google Fannon petroleum

Van Metre Homes - Microsoft Internet Explorer
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Address http://www.vanmetrehomes.com/properties/one.asp
Google Van Metre Homes

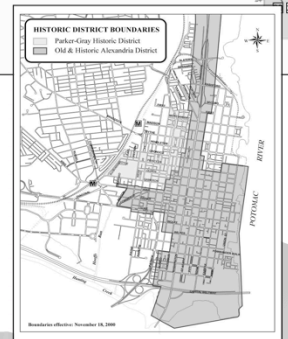
REDEVELOPMENT PLANS



**VAN METRE COMPANIES
FANNON PROPERTY - DUKE STREET
ALEXANDRIA, VIRGINIA
20 YEAR ECONOMIC BENEFIT ANALYSIS
February 2005**

Multi-family Units	60
Retail Square Feet	0
Parking Spaces	140
Real Estate Valuation Upon Completion	\$45,000,000
City of Alexandria Economic Benefits	
Year 1	
Property Taxes	\$447,750
Affordable Contribution	\$84,888
Tap Fees	\$60,000
Total	\$1,182,750
20 Year Total	

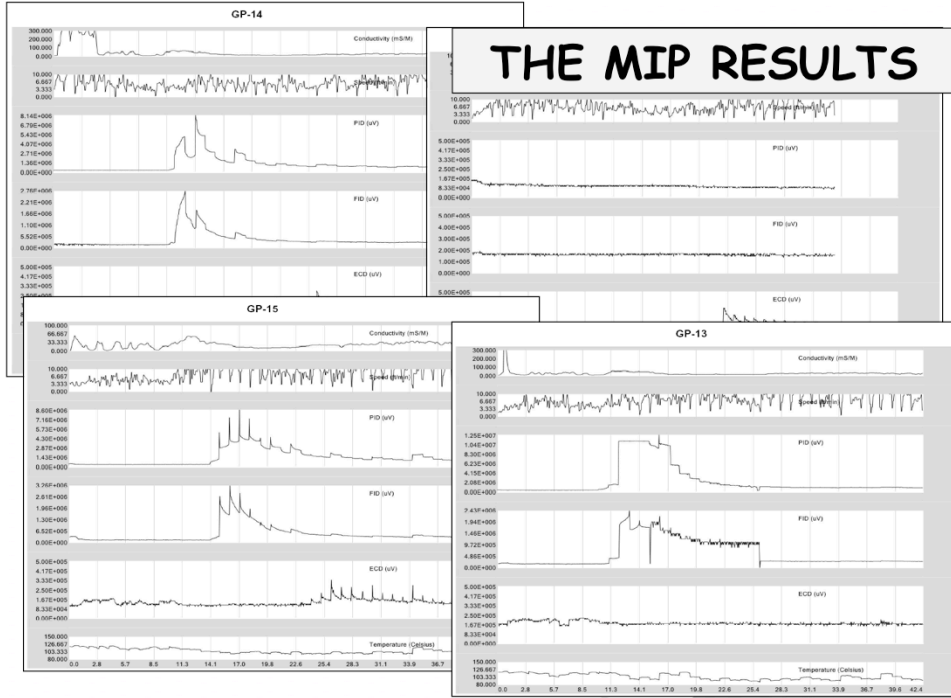
REDEVELOPMENT PLANS



Sum of Co
Year 1

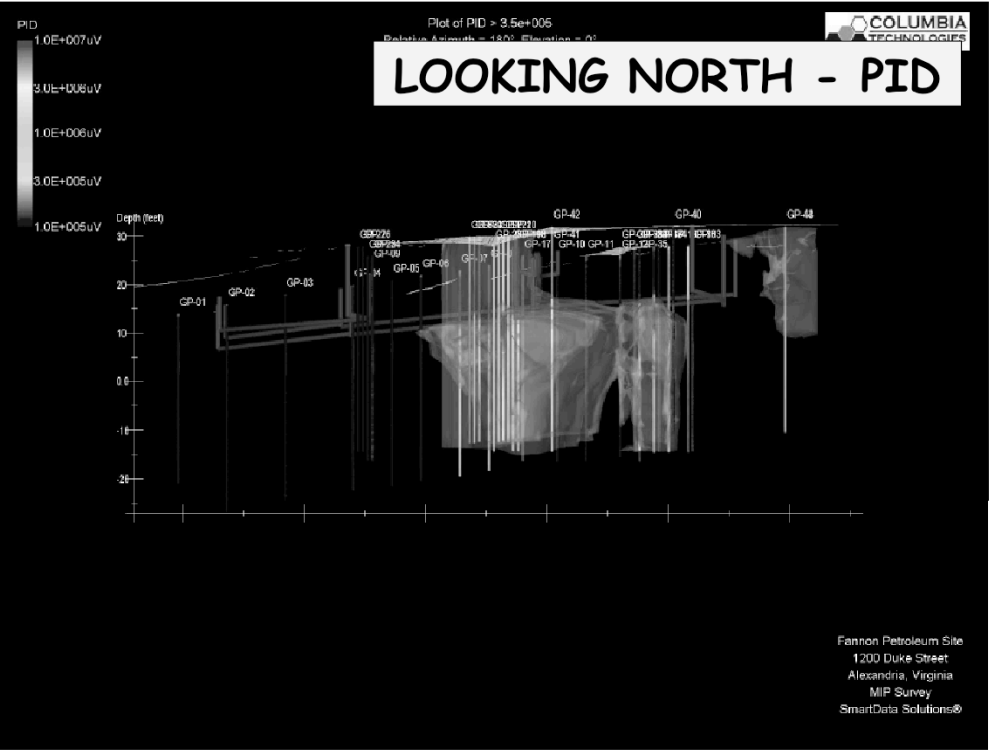
20 Year

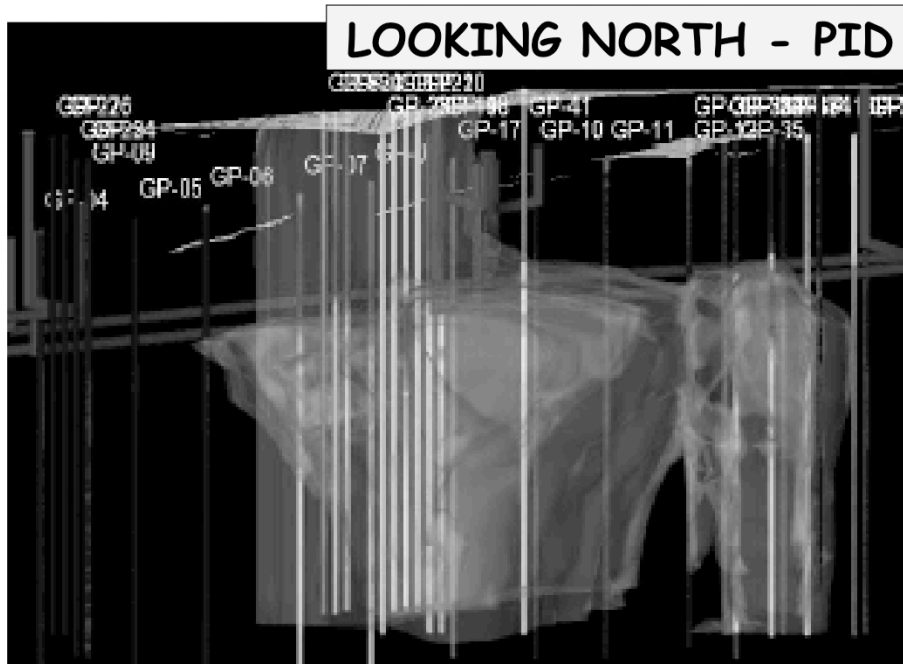




UTILITIES & MIPs







MIP RESULTS - PID





COMPARISON OF RESULTS

- MIP results closely correlated with plume defined by traditional methods.
- MIP identified previously unknown vector.
- Plume appeared to intersect sanitary / storm sewer system.
- Logical explanation for historic discovery.
- Once source area removed, additional impacts should be reduced.

UTILIZING THOSE RESULTS

- Some adjustments to construction plan (e.g. depth of structures)
- Negotiated environmental redevelopment actions which could be potentially be reimbursed under VPSTF
- Plans and permits continued through local approval process
- Results presented to /discussed with local officials and community

ECONOMIC DELAYS

S&P/Case-Shiller Home Prices		
City	Month over Month % Chg (Nov. to Dec.)	Year over Year % Chg (Dec '06- Dec '07)
Miami	↓ -2.64	↓ -17.50
Las Vegas	↓ -2.92	↓ -15.34
Phoenix	↓ -3.49	↓ -15.27
San Diego	↓ -3.41	↓ -14.96
Los Angeles	↓ -3.08	↓ -13.70
Detroit	↓ -1.84	↓ -13.56
Tampa	↓ -1.63	↓ -13.33
San Francisco	↓ -3.20	↓ -10.80
Washington DC	↓ -2.54	↓ -9.41
Minneapolis	↓ -2.02	↓ -8.01
Cleveland	↓ -1.08	↓ -6.36
New York	↓ -1.02	↓ -5.60
Chicago	↓ -0.98	↓ -4.52
Denver	↓ -1.78	↓ -4.47
Atlanta	↓ -1.54	↓ -3.42
Boston	↓ -1.68	↓ -3.36
Dallas	↓ -1.32	↓ -2.35
Seattle	↓ -1.21	↑ 0.49
Portland	↓ -0.64	↑ 1.22
Charlotte	↓ -0.59	↑ 2.34
Composite 10 City	↓ -2.21	↓ -9.82
Composite 20 City	↓ -2.10	↓ -9.08

Redevelopment
 scheduled for...
~~Summer 06... Fall 06...~~
~~Winter 06... Spring 07...~~
~~Summer 07... Fall 07...~~
~~Winter 07... Spring 08?~~

-9.41%

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SUMMER 2007 - TANKS EXCAVATED



REMEDIATION SYSTEM RELOCATED

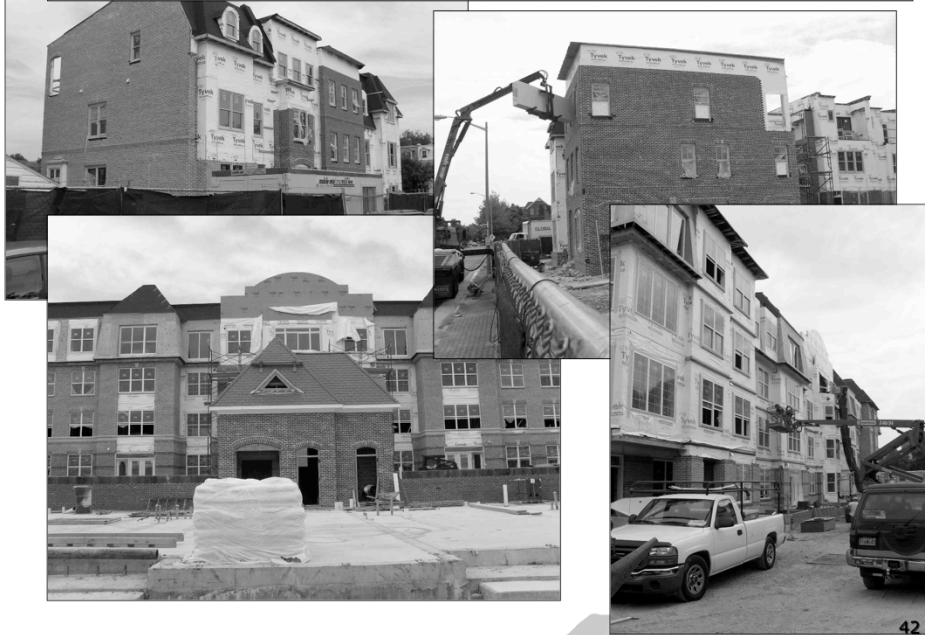
REDEVELOPMENT 2007 / 2008



REDEVELOPMENT 2007 / 2008



REDEVELOPMENT 2008 / 2009



ACTIONS DURING REDEVELOPMENT

- Excavation and removal of 28 USTs
- Excavation and disposal of 35,317 tons of petroleum impacted soil
- Recovery and disposal of 1,000 gallons of free-phase petroleum
- Ongoing subsurface remediation at down-gradient adjacent property
- Continued reduction in amount of subsurface contamination
- Post CAP monitoring in near future

CURRENT SITUATION

- RP continues under CAP and VPSTF
- Developer obtained Bonifide Prospective Purchaser (BFPP) letter
- Developer purchased land in May 2008
- Condos and Townhomes available for occupancy Fall 2009



THINGS IN OUR FAVOR

- DEQ Petroleum Program approved by EPA
- Regulatory and Technical combined
- Technical and Money combined
- Risk Based cleanup allows technical flexibility
- DEQ has local presence
- Lower Geo / Hydro difficulty (not rocket science)

THINGS IN OUR FAVOR

- Value of property
- Involvement of local government
- Occurrence of community meetings
- Educated population - good (sometimes not)
- Examples of successful redevelopment of petroleum sites in area
- State Brownfields Program

OBSERVATIONS / RECOMENDATIONS

- Importance of personal involvement!!!!!!
- Hand holding and/or neck ringing
- Negotiate and/or standing firm
- Willing to look at Big Picture
- Some issues are outside your control
- Changes out of left field
- Market forces and costs



Questions, Comments, Criticisms?

Randy Chapman: 703-583-3816 or wrchapman@deq.virginia.gov

© 2008 Tele Atlas
Point: 38°48'12.99" N 77°03'15.87" W elev. 26 ft Streaming 100% Eye alt 300 ft 48



Redevelopment of Brownfield Sites

A Local Perspective

ECO-CITY  ALEXANDRIA

City of Alexandria Local Contaminated Land Program

- Authority for local program is generated from the City's Zoning Ordinance (Article 11-410(V)) and the Development Site Plan Conditions
- Program was started due to number of impacted sites within City limits
- Typically requires minimal additional information beyond what VDEQ is requiring



City of Alexandria Local Contaminated Land Program

- Standard submittal includes Site Characterization, Risk Assessment, Soil Management Plan and Health and Safety Plan.
- Summary of the above is placed on approved Site Plan.
- Information available to City Inspectors during construction and is archived for historical reference.



Local Requirements for Fanno Development Site

- Upgraded Vapor Barrier
- Active sub-slab ventilation system
- Installation of secondary garage sump to handle perimeter foundation drain
- Installation of groundwater treatment unit to handle water collected in foundation

Design to provide to permit
history and ongoing remediation
measures



Fan to convert to an active sub-slab ventilation system



Upgraded vapor barrier



Installation of secondary sump for perimeter foundation drain



2. **Site History** The Condominium property was formerly operated by Taurus Resources, Inc. (the "Former Owner") as a petroleum fuel storage and storage facility, with petroleum fuel stored in underground storage tanks. Over the years, while the Condominium property was operated by the Former Owner, there was some release of petroleum products into the soil and groundwater (the "Historical Release"). In anticipation of redevelopment of the site, the Fairfax County Department of Environmental Quality ("DEQ") engaged a Consulting Geologist to inspect the Condominium property (the "CGIP"). The CGIP was approved in 1991 and amended in 2005. The CGIP set forth the remediation and monitoring activities required to address the petroleum fuel releases at the Condominium property. The CGIP has been implemented, and the work substantially completed. The completed work included removal of all underground storage tanks, removal of certain petroleum impacted soil, and treatment of some of the impacted groundwater. Since the site remediation and site cleanup activities have been completed, ongoing monitoring and remediation of impacted groundwater will occur via a groundwater pump and treat system located across from the site. Based on the activities performed to date, the DEQ issued a letter acknowledging that all releases in the CGIP have been addressed. The letter also stated that the DEQ has been monitoring the "Remediation Objectives" and that the CGIP will be updated and will be directly related to the Condominium property's development. Upon the completion of construction, the CGIP will be updated and will be directly related to the Condominium property's development. Upon the completion of construction, the CGIP will be updated and will be directly related to the Condominium property's development. Further information can be obtained from the DEQ, Reference Case No. EL-0751-03-04 and 05-031.

DEQ has issued a letter, attached as part of Appendix IX to the Declaration for the Condominium, which confirms the Seller and its affiliates, successors and assigns, including purchase of individual condominium units and the Association upon formation, "successor parties" with respect to the Historical Release for purposes of Virginia law as a result of purchasing a unit in the Condominium property, and therefore such parties have no liability to DEQ in connection with the Historical Release.

Seller will be required to acknowledge that it is familiar with the history of the Condominium property (including, but not limited to, the Historical Release, the CGIP and the various Cleanup Orders) and understands and acknowledges that it has the full opportunity to investigate the same. Seller and Buyer are hereby in Buyer or the Association with respect to the Historical Release. Buyer, or its successors, shall be responsible for the purchase price of the Unit and all environmental liabilities with respect to the Historical Release, and shall be responsible for the cleanup and remediation of the Historical Release. The Buyer, or its successors, shall be responsible for the purchase price of the Unit and all environmental liabilities with respect to the Historical Release. The Buyer, or its successors, shall be responsible for the purchase price of the Unit and all environmental liabilities with respect to the Historical Release. The Buyer, or its successors, shall be responsible for the purchase price of the Unit and all environmental liabilities with respect to the Historical Release.

The City of Alexandria Office of Environmental Quality (the "OEQ") requires that water that collects in the perimeter foundation drain for the parking garage be captured from other water on the Condominium property. To accomplish this, Seller will install a sump below the parking garage, filling with an approved secondary sump (the "Secondary Sump System") that will collect the water that accumulates in the foundation drain ("Foundation Water"). The OEQ requires that the Foundation Water be removed to a stormwater basin of the Foundation Water is concerned by petroleum from the Historical use of the Condominium property and surrounding area.

Disclosure of history & remedial efforts to potential buyers



City Benefits

- Estimated \$36,000,000 Real Estate Valuation
(Mix of Townhomes and Condominiums)
- Annual tax revenue of approximately \$320,000
- Doubles existing the tax revenue
- Increase in adjacent property values



Community Involvement and Benefits

- Cooperation of adjacent Shilo Baptist Church allowed continued operation of existing subsurface remediation system
- Positive comments from community during development public hearings
- Community viewed redevelopment as opportunity to enhance character of neighborhood



Contact Information

City of Alexandria

Attn: Daniel Imig

Office of Environmental Quality

301 King Street, City Hall Room 3000

Alexandria, VA 22314

(T) 703-746-4065

daniel.imig@alexandriava.gov



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Resources & Feedback

- To view a complete list of resources for this seminar, please visit the **Additional Resources**
- Please complete the **Feedback Form** to help ensure events like this are offered in the future

The screenshot shows a web form titled "U.S. EPA Technical Support Project Engineering Forum Green Remediation: Opening the Door to Field Use Session C (Green Remediation Tools and Examples) Seminar Feedback Form". The form includes fields for "First Name", "Last Name", "Daytime Phone Number", and "Email Address". A checkbox is labeled "Please send a copy of my feedback confirmation as a record of my participation to this address". The date of the seminar is listed as "December 15, 2009".

Need confirmation of your participation today?

Fill out the feedback form and check box for confirmation email.