

EPA COMMUNITY INFORMATIONAL GROUP MEETING SUMMARY
MOTOROLA 52ND STREET SUPERFUND

DRAFT DOCUMENT

Prepared by:

SHAW ENVIRONMENTAL, INC.
180 PROMENADE CIRCLE
SACRAMENTO, CALIFORNIA 95834

August 2012

**Community Information Group Meeting
Motorola 52nd St. Superfund Site
August 16, 2012
Bioscience High School, Phoenix, AZ**

Project Team and Regulator Attendees:

United States Environmental Protection Agency (EPA): Janet Rosati, David Cooper, Gerry Hiatt, Martin Zeleznik

EPA Contractor: Shaw Environmental, Inc. (Shaw): Sue Kraemer, Doug Hulmes

Arizona Department of Environmental Quality (ADEQ): Harry Hendler, Brian Stonebrink, Wendy Flood, Travis Barnum

ADEQ Contractor: William Neese, URS Corporation

Technical Assistance Grant (TAG) Technical Advisor: Richard Rushforth

Moderator: Marty Rozelle

CIG Members:

Anayensi Almaraz

Doug Tucker Les Holland

Rena Chase-Dufault

Martha Breitenbach (via telephone)

Mary Moore

Quentin Boyce

Wendoly Abrego

Shoshana Kroeger

Additional attendees:

Barbara Murphy

Chris Legg

Delores Sullens

Denise Moreno

Eva Olivas

Gregg Elliot

Ira Doonsky

Jenn McCall

Loren Lund

Mark Brusseau

Nick Reithel

Ray Chase

Virgina Chase

Rob Mongrain

Robert Livermore

Sarah T. Wilkinson, PhD

Steve Brittle

Tasha Lewis

Tom Padgett

Tom Suriano

Troy Kennedy

The following acronyms may be used throughout this document:

ADEQ Arizona Department of Environmental Quality
ADHS Arizona Department of Health Services
ATSDR Agency for Toxic Substances Disease Registry
CDC Center for Disease Control
CIG Community Information Group
CMD Contaminate Mass Discharge
CoC Contaminant of Concern
DCE Dichloroethylene
EPA Environmental Protection Agency

HHRA Human Health Risk Assessment
RI/FS Remedial Investigation/Feasibility Study
OU Operable Unit
PCE Tetrachloroethylene
TCE Trichloroethylene
PRP Potential Responsible Party
 $\mu\text{g}/\text{m}^3$ Microgram per cubic meter
VC Vinyl Chloride
VOC Volatile Organic Compound

A Community Information Group (CIG) meeting was held at Sonoran Science Academy, located at 4837 E. McDowell Road Street in Phoenix, Arizona from approximately 6:15 pm to 8:45 pm on August 16, 2012. The primary purpose of the meeting was to update the public on the current status and remedial progress at the Motorola 52nd Street Superfund Site, answer questions leftover from previous meetings, and present the latest data for indoor air and sub-slab sampling. The meeting also provided a forum for interaction between stakeholders, regulators and the public.

The meeting notes and the Powerpoint presentations presented at this CIG meeting are posted on EPA's and ADEQ's Motorola project websites:

www.epa.gov/region09/motorola52ndst
<http://www.azdeq.gov/environ/waste/sps/phxsites.html#mot52a>

6:15 pm: Dr. Marston began the meeting; she stated the purpose of the meeting and thanked Ms. Abrego and Sonoran Science Academy for providing the facility and handling the logistics of coordinating the meeting. Dr. Marston asked CIG members and residents (people that are not getting paid to be present) to introduce themselves. Ms. Rozelle then asked regulators and Mr. Rushforth, Technical Advisor for the CIG, to introduce themselves. Ms. Rozelle reviewed the ground rules and agenda and opened the forum for action items.

6:30 pm: Mr. Holland stated "we've been told by the EPA in the past that they cannot do health studies." He presented a health study from Montana, in which 400 people died from asbestos exposure. Mr. Holland indicated the health study was paid for by the CDC after the EPA declared a health emergency. Mr. Holland indicated that he provided a copy of the Montana health study to the CIG members and David Cooper of the EPA, and he requested the health study be included in the meeting minutes. Mr. Holland indicated it is clear that EPA can cause health studies to happen even if they do not fund them themselves, and a health study for M52 is long overdue.

Dr. Hiatt responded that EPA doesn't have the resources or authority to do a health study themselves and typically health studies are completed by Medical Doctors, which EPA does not have on staff. Dr. Hiatt further indicated there are two ways to have a health study completed. The first is to have a local health agency conduct the study and if he recalled correctly the Arizona Department of Health Services did do some research looking at cancer rates in the M52 area. Mr. Holland indicated they did and the Department said that zip code 85008 had a lower cancer rate than the rest of the County, and they did not see a problem. Mr. Holland stated that "my technical read is of course that M52 is probably the source of the cancers recorded at the home addresses and no one has refuted that brief but powerful analysis."

Dr. Hiatt explained the second way to complete a health study is to involve a federal agency called the Agency for Toxic Substances at Disease Registry (ATSDR), which is part of the CDC and was involved with the case study in Montana that Mr. Holland mentioned. Mr. Holland indicated he would like EPA to get ATSDR involved at M52. Dr. Hiatt indicated he could take that back to the agency, and that ATSDR has given presentations in CIG meetings in the past. Community member asked if asbestos was issue at M52, Ms. Rozelle indicated no, asbestos was just an example.

Ms. Rozelle asked for comments and approval of last meetings' April 25, 2012 minutes. Mr. Holland indicated they were very complete and CIG members granted approval of meeting minutes.

6:36 pm: Vapor Intrusion to Indoor Air Investigation and Findings – Janet Rosati, EPA

- Summarized vapor intrusion processes, number of sampling events and sampling methodology of OUI investigation.
- Discussed the new toxicity standard for TCE, and subsequent changes to sub-slab and indoor air screening levels, and additional locations sampled due to the new toxicity standard.
- Seven mitigation systems have been installed, with eight pending, and there are two in which the property owner denied access
- Explained how the slab depressurization mitigation systems worked

Ms. Rozelle indicated questions could be asked after Dr. Hiatt's presentation

6:47 pm: Update Indoor Air & Sub-Slab Sampling - Motorola 52nd St. Site - Dr. Gerald Hiatt, EPA

- Discussed multiple lines of evidence, and basics of vapor intrusion
- Discussed indoor air protective risk range (0.4 – 2 $\mu\text{g}/\text{m}^3$) and updated SGHSLs (significant reduction); EPA's goal is to ensure that indoor air is less than 2 $\mu\text{g}/\text{m}^3$
- Discussed new sub-slab residential soil screening level of 190 $\mu\text{g}/\text{m}^3$ derived from the new TCE toxicity standard and how it is used to assess indoor air; and explained that EPA has expanded the study area based on the new screening levels
- Discussed sub-slab and indoor air results from three separate events in four different study areas
- Discussed indoor results from schools and that sub-slab sampling at the schools could compromise structural integrity, and therefore sub-slab samples were not collected under schools. Dr. Hiatt explained that the vast majority of results at schools were well below risk range or not detected. One elevated result may have been from sub-slab penetration.
- Discussed outside air results

7:12 pm: Dr. Hiatt opened the forum for questions. Dr. Marston asked how confident will EPA be that all vapor intrusion sources will be identified. Dr. Hiatt explained the multiple lines of evidence, and they looked at elevated soil gas concentrations to determine where they needed to do sub-slab and indoor air sampling. He indicated they were fairly confident that EPA has addressed all areas that vapor intrusion could be occurring, based on summation of all data. Dr. Marston asked when EPA expects installation of all mitigation systems will be completed. Ms. Rosati indicated it will depend on obtaining access and the installer's schedule; and mitigation systems cannot be installed in attics until the weather has cooled, due to safety reasons. Dr. Marston's third question: how do we know the mitigation systems are working? Dr. Hiatt indicated there is a gas pressure manometer that the resident can read which will confirm the system is running at the correct vacuum, and there is an audible alarm if the fan stops running.

Ms. Kroeger asked when TCE levels are detected above the acceptable range, does EPA communicate the potential health risks and advise the resident to seek medical attention. Dr. Hiatt indicated they do contact each homeowner personally to tell them the results and what EPA thinks the significance is; and it is difficult to determine historical exposure; and that EPA is willing to talk to personal doctors to explain the exposure pathway and known potential health risks, etc.

Ms Abergo: asked is there anything a resident can do to help mitigation, such as altering flooring materials. Dr. Hiatt explained one easy thing to do is bring in more outside air; modern houses are more energy efficient and minimize outdoor air intake, which actually increases vapor intrusion concerns. He further stated EPA is hesitant to ask residents to redo flooring, due to effectiveness of depressurization systems.

7:20 pm: Ms. Rozelle moderated. Mr. Holland indicates he liked the presentation, particularly the way the risk range was presented.

Ms. Moore asked if second stories are ever sampled? And do they mitigate only one apt or a whole bldg. Dr. Hiatt explained concentrations are much higher in the 1st story, and therefore second stories are not sampled. A final decision has not yet been made on how to handle multi-suite apartments; they will look at several factors such as building construction, concentration gradients within suites of building, and much data still needs to be reviewed. Ms. Moore asked if Brunson-Lee school will be sampled. Dr. Hiatt and Ms. Rosati stated that it has already been sampled. Community member asked about footings and house construction; he stated he had a wood floor, and would that increase the risk of vapor intrusion? Dr. Hiatt indicated that it might, intuitively a wood floor would be looser than a concrete floor.

7:30 pm: Break

7:37 pm – Motorola 52nd St. Site OU-1 Update – Mr. Wayne Miller, ADEQ

- Annual Effectiveness report indicates groundwater treatment is working well
- Groundwater remediation in bedrock is feasible, but difficult; more wells may be installed
- Treated effluent is currently disposed into the Phoenix sanitary sewer system, which has beneficial use at the Palo Verde nuclear generating station
- Summarized future issues

Ms. Abergó asked: what is surface water discharge, sub-surface discharge and beneficial use? Mr. Miller explained surface water discharge is usually into a canal, subsurface discharge is injecting treated water into the subsurface through wells, one beneficial use can be to use the treated water to “flood” an aquifer, by injecting upgradient and driving water downgradient to a point where it can be pumped out. Mr. Holland asked how much water is discharged to the Phoenix sewer and how much it costs. Ms. McCall indicated approximately 258 gallons per minute and Freescale pays the City of Phoenix approximately \$25,000 a month.

Ms. Kroeger asked since it is difficult to extract contamination from bedrock, what are the options? Mr. Miller and Mr. Zelenik indicated much depends on the feasibility study; and will take years to get to a final remedy; Ms. Kroeger indicated that at some point the City will have to use the injected water eventually right? Mr. Miller indicated the City has a good water treatment system, and was confident that effluent injected into an aquifer and then treated again by the City prior to distribution would be fit for consumption. Ms. Kraemer explains the majority of drinking water comes from alluvial aquifers, not bedrock. Mr. Suriano indicated the OU1 area is not considered to have a high enough volume of water to be valuable for municipal use.

Mr. Rushforth stated that most municipalities’ long term plans indicated there will be a significant decrease in agricultural land and asked what beneficial uses other than irrigation there may be for the treated water. Mr. Miller indicated that water released into a canal or the Salt River, would meet drinking water standards and he did not know what Salt River Project may do with the water, they could possibly sell it to municipalities. Mr. Suriano indicated that municipalities may elect to recharge aquifers with the treated water.

Ms. Moore asked if the beneficial use would have to remain agricultural? Dr. Marston indicated no not necessarily there are several options for the treated water, such as creating a lake.

8:02 pm: - Updates on Honeywell Indoor Air Sampling – Mr. Brian Stonebrink, ADEQ

- Explained building survey and indoor air sampling methodology at Honeywell 34th Street facility
- Explained the QA/QC protocols with ADEQ split samples
- Discussed outdoor air samples, indicating one ADEQ split result was approximately three times higher than the PRP’s result.
- Concluded all air indoor samples were below industrial pre-screening levels at the Honeywell facility

Dr. Marston asked if there were other facilities in OU2; Mr. Stonebrink explained Honeywell is the biggest facility in OU2; however, ADEQ is looking at other smaller PRP’s in OU2, and it is possible there could be consent orders with these facilities in the future.

Ms. Almaraz asked if ADEQ would consider resampling an outdoor air location in which ADEQ’s result was three times higher than the PRP’s result. Mr. Stonebrink explained he did not think it would need to be resampled because there are several other outdoor air samples in the area and it is not uncommon for there to be anomalies in outdoor air samples.

Ms. Moore asked if there have been other outdoor air samples at Honeywell. Mr. Stonebrink indicated yes, there were 12 samples collected at this site. Ms. Moore asked “what are the industrial screening levels for each compound in question.” Mr. Stonebrink displayed the slide which showed the screening levels and reviewed them. Ms. Moore asked about the difference between residential and industrial; Dr. Hiatt explained the differences in time of exposure utilized to derive residential and industrial standards. Ms. Moore asked for clarification regarding the effects of dilution on detection limits; Mr. Stonebrink indicated that detection limits can be dependent on the lab, and he could put together a simple slide for the next meeting.

Ms. Rozelle moderated into the second presentation by Mr. Stonebrink

8:17 pm Former Kachina Joray Indoor Air Sampling – Mr. Brian Stonebrink, ADEQ

- Summarized history of operations at Kachina Joray
- High PCE concentration in soil gas, much less in soil greater than 10 feet bgs, highest concentrations were near the former degreaser
- Summarized EPA’s IA results – elevated results are likely from current plant operations
- Summarized SVE installation

Mr. Holland asked what the radius of influence for SVE is and Mr. Mongrain indicated 80 feet in Salt River Gravels.

Ms. Abergó asked about discrepancies in screening levels for indoor air. Mr. Stonebrink explained the toxicity standard for PCE was changed, based on health studies. Mr. Holland explained PCE was less toxic than originally thought.

Ms. Moore indicated there were high PCE levels in soil gas at the boundary of Kachina Joray, why did they stop; is there additional information as to where the contamination may have gone? Mr. Stonebrink indicated that they did sample residential properties to the south, and results indicated mitigation systems were not required. Ms. Moore asked if they are going to further investigate the fence line. Mr. Stonebrink indicated that the primary concern is to get the SVE system up and running, the fence line may be looked at later.

Ms. Rozelle indicated there was one action item for Mr. Stonebrink; he indicated the action item pertained to why some samples required dilution; he indicated he would discuss with his consultant.

8:32 pm Ms. Rozelle opened the forum to Calls to the Public; no responses. Ms. Rozelle indicated the next meeting would be October 24.

Ms. Rozelle summarized the following items for next agenda:

- Effectiveness report for OU2
- OU1 update; Ms. Rosati indicated they will not have validated data, but can talk about preliminary data.
- TAG Presentation
- Goal Setting Session

Ms. Rozelle asked if the CIG members would like anything added to the agenda. Ms. Moore asked if there will any new reports that could be reviewed for the next meeting. Dr. Marston indicated she would like to see the data from this the latest sampling round; Ms. Rozelle indicated it is unlikely the data would be validated by the next meeting. Ms. Moore asked Mr. Stonebrink if he wanted to give more information once ADEQ reviewed the report for Honeywell. Mr. Stonebrink indicated he can provide more information in the meeting. Dr. Marston stated she would like to see Bioscience High School students derive creative ideas to use the treated groundwater.

Community member asked if they have been reports on health issues due to vapor intrusion at OU1, has anyone gone to the hospital. Dr. Hiatt indicated not that they know of; and repeated that Arizona Department of Health

Services have looked at cancer rates in the area and found no unusual trends. Mr. Holland stated the cancer rate for this zip code is less than the rest of County, but cancer is reported from homes not work places. Community member asked if there are other signs and symptoms of TCE exposure. Dr. Hiatt explained TCE can cause elevated cancer risks, birth defects and congenital heart defects.

Community member asked once mitigation systems are installed, will it remove symptoms? Dr. Hiatt explained it essentially depends on how long exposure has occurred; if source is eliminated subsequent risk is gone, but pre-existing exposure cannot be changed.

8:45 pm Meeting adjourned.

ATTACHMENT 1
MEETING PRESENTATIONS

FORMER JORAY/KACHINA UPDATE

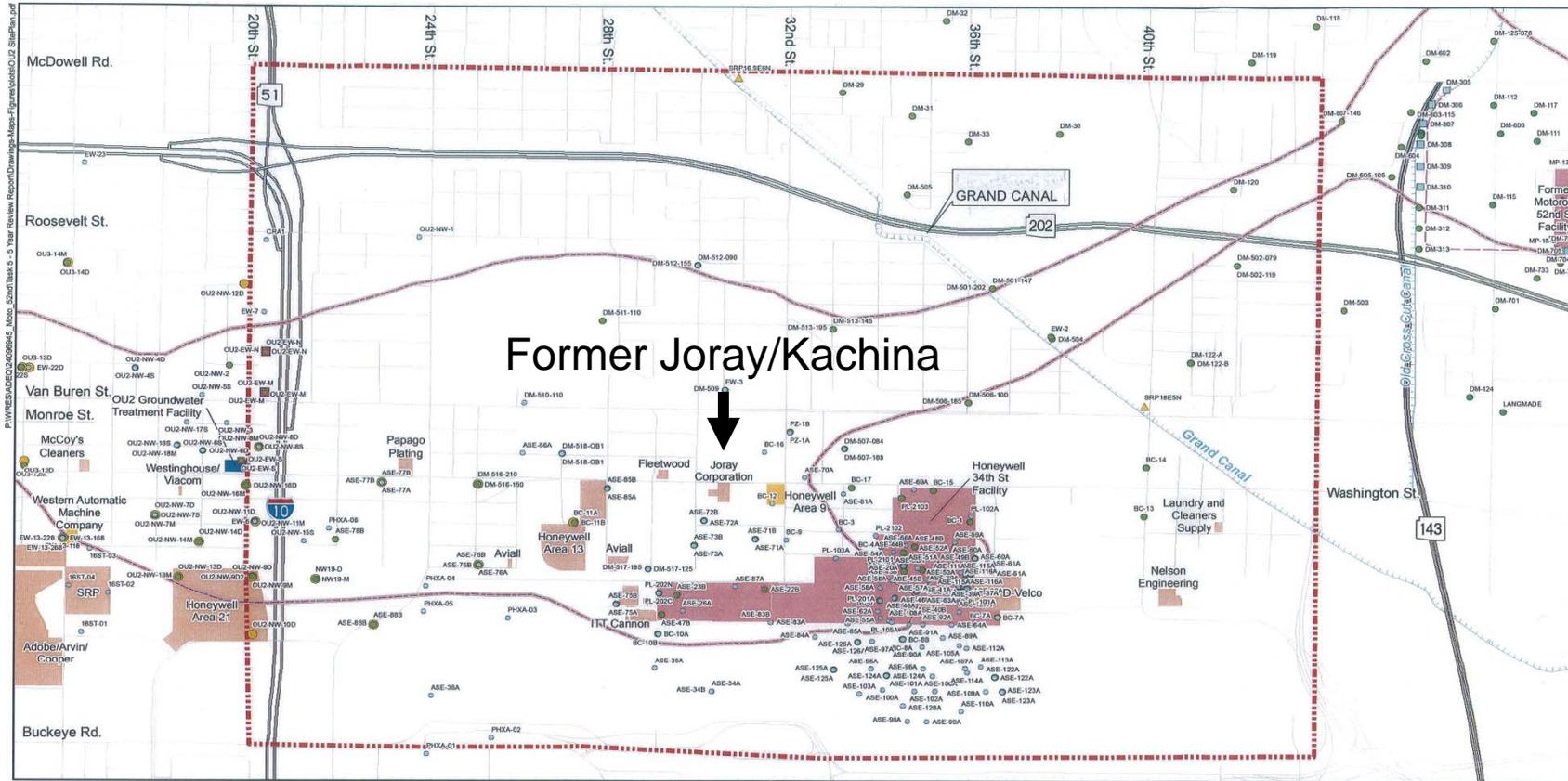


Motorola 52nd Street Superfund Site-OU2 Former Joray/Kachina Update

**Community Informational Group Meeting
August 16, 2012**



Former Joray/Kachina on Site-Wide Map



Former Joray/Kachina

Legend

- - - OU Boundary
 - - - Inferred Extent of VOCs Exceeding AWQS Based on 2009 Data
 - Highway
 - Road
 - Canal
 - - - Dual-Wall Pipeline
- Responsible Party
 - Potentially Responsible Party
 - Property Issued a Notice of Completion of Work
 - Groundwater Treatment Plants
- Monitoring Well in HSU A
 - Monitoring Well in HSU B
 - Monitoring Well in HSU D
 - Extraction Well A
 - Extraction Well B
 - Extraction Well D
 - ▲ SRP Well

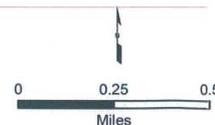


FIGURE 3-2
OU2 SITE PLAN
2011 Sitewide Five-year Review
Motorola 52nd Street Superfund Site

Former Joray/Kachina Facility

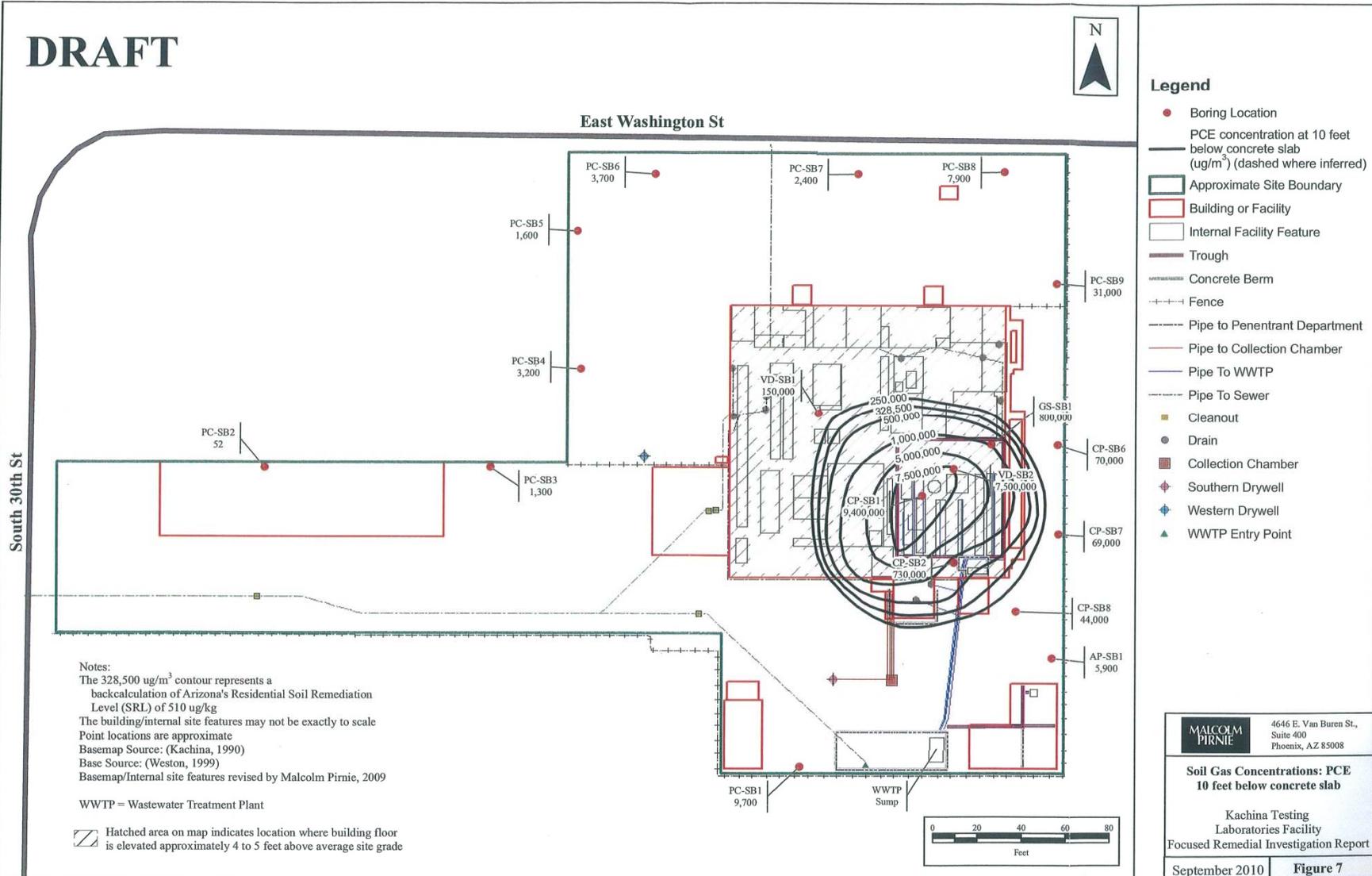
- Located at 30th Street and Washington
- Operated by the Joray Corporation from 1980 to 2000 as Kachina Testing Laboratories
- Operated from 2000 to 2004 as Kachina Technical Services and Processes
- Performed Testing & Services for the aerospace & commercial manufacturing industry

Soil Gas

- Soil and Soil Gas Sampling conducted during 2009-2010 Focused Remedial Investigation
- High levels of PCE detected in shallow soils from beneath the facility
- High levels of PCE in soil gas

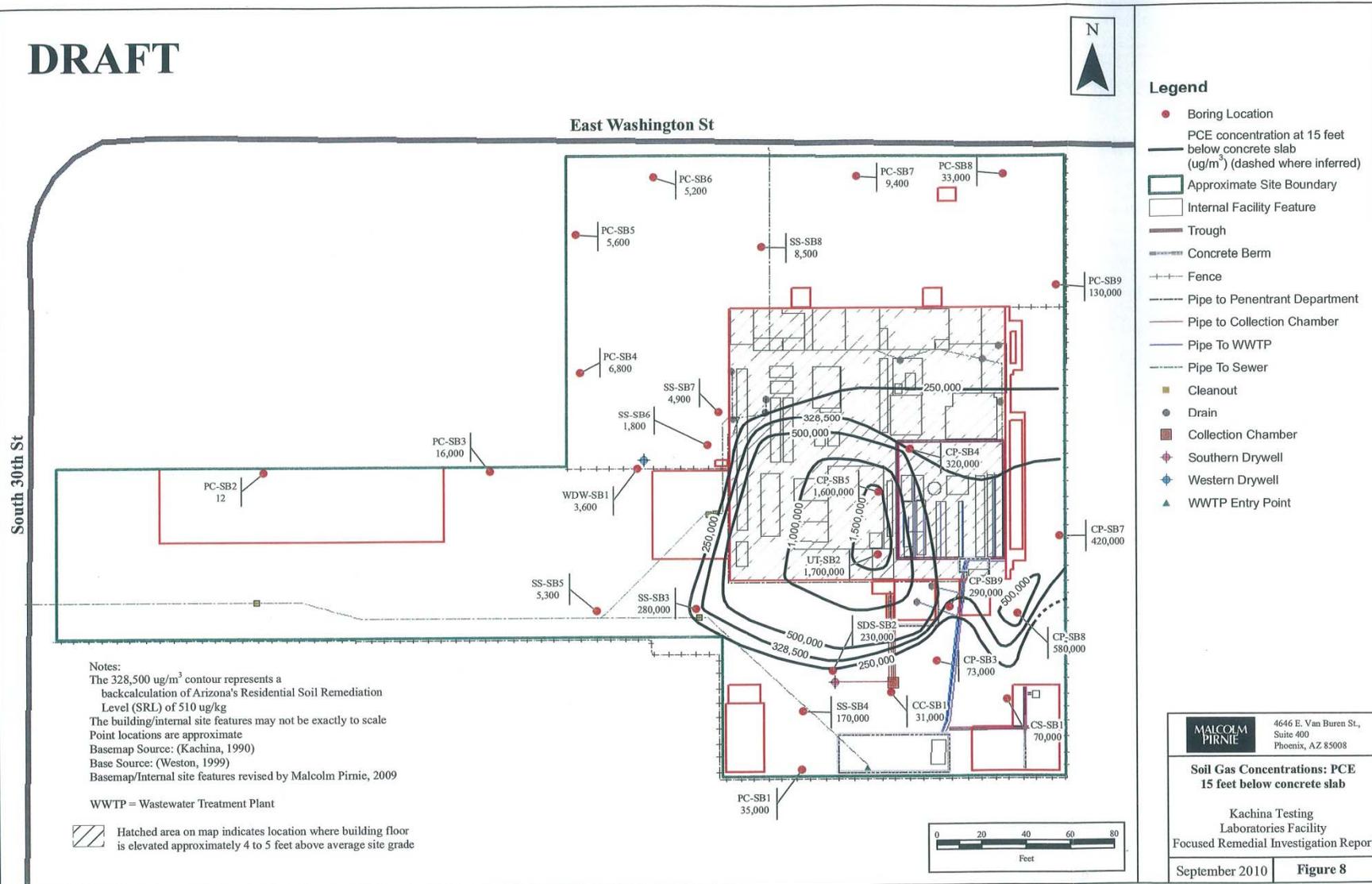
Soil Gas PCE 10 Feet Depth

DRAFT



Soil Gas PCE 15 Feet Depth

DRAFT



- Legend**
- Boring Location
 - PCE concentration at 15 feet below concrete slab (ug/m³) (dashed where inferred)
 - Approximate Site Boundary
 - Internal Facility Feature
 - Trough
 - Concrete Berm
 - Fence
 - Pipe to Penetrant Department
 - Pipe to Collection Chamber
 - Pipe To WWTP
 - Pipe To Sewer
 - Cleanout
 - Drain
 - Collection Chamber
 - ◆ Southern Drywell
 - ◆ Western Drywell
 - ▲ WWTP Entry Point

Notes:
 The 328,500 ug/m³ contour represents a backcalculation of Arizona's Residential Soil Remediation Level (SRL) of 510 ug/kg
 The building/internal site features may not be exactly to scale
 Point locations are approximate
 Basemap Source: (Kachina, 1990)
 Base Source: (Weston, 1999)
 Basemap/Internal site features revised by Malcolm Pirnie, 2009

WWTP = Wastewater Treatment Plant
 Hatched area on map indicates location where building floor is elevated approximately 4 to 5 feet above average site grade

MALCOLM PIRNIE 4646 E. Van Buren St., Suite 400 Phoenix, AZ 85008

Soil Gas Concentrations: PCE 15 feet below concrete slab

Kachina Testing Laboratories Facility Focused Remedial Investigation Report

September 2010 **Figure 8**

Vapor Intrusion Investigation

- EPA collected indoor air samples inside the building, from neighboring residences and businesses in February and March 2011
- June 2012 Fact Sheet was sent out to the community

Indoor Air Sampling Locations

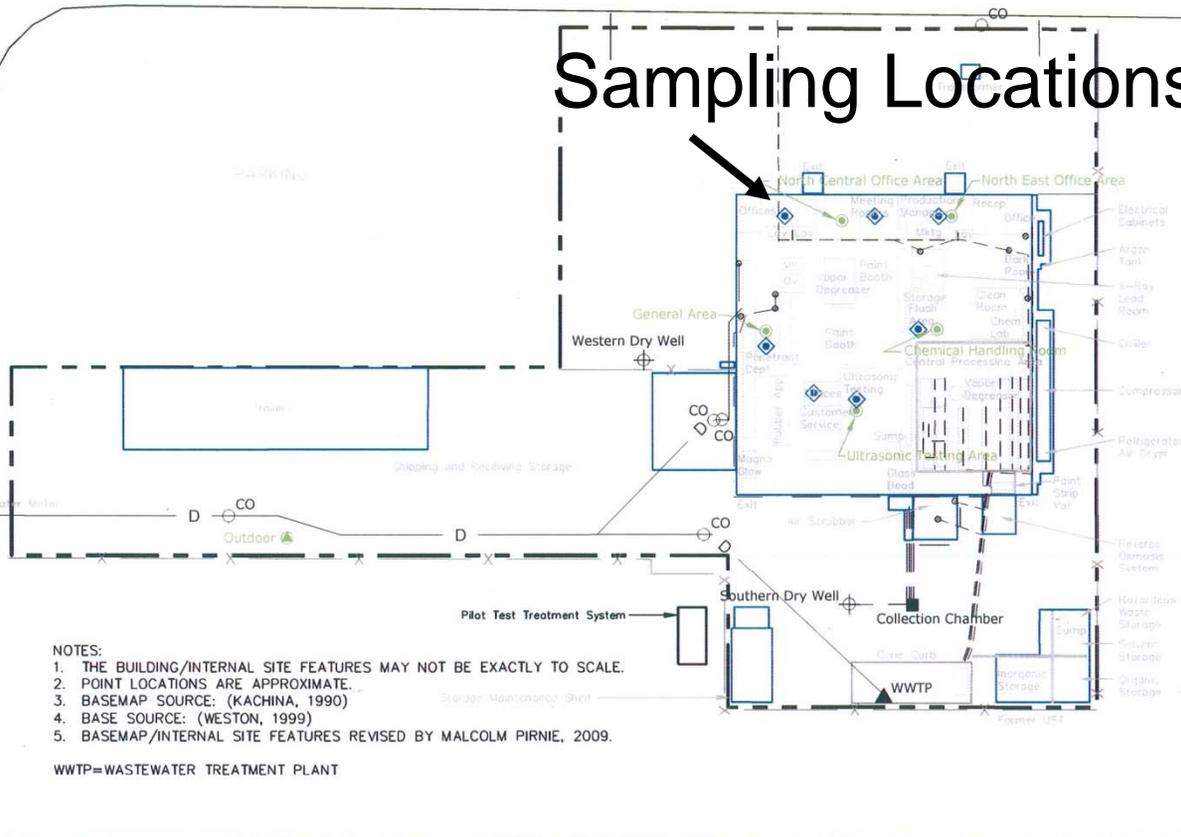
E. WASHINGTON STREET

Sampling Locations

LEGEND

- Approximate Site Boundary
- Building or Facility
- Internal Facility Feature
- Trough
- Concrete Curb
- Fence
- Pipe to Penetrant Dept
- Pipe to WWTP
- Pipe to Collection Chamber
- Pipe to Sewer
- Clean Out
- Drain
- Indoor Air Sample Location
- Outdoor Air Sample Location
- USEPA Indoor Air Sample Location
- Collection Chamber
- Southern Dry Well
- Western Dry Well
- WWTP Entry Point

S. 30th STREET



- NOTES:
1. THE BUILDING/INTERNAL SITE FEATURES MAY NOT BE EXACTLY TO SCALE.
 2. POINT LOCATIONS ARE APPROXIMATE.
 3. BASEMAP SOURCE: (KACHINA, 1990)
 4. BASE SOURCE: (WESTON, 1999)
 5. BASEMAP/INTERNAL SITE FEATURES REVISED BY MALCOLM PIRNIE, 2009.

WWTP=WASTEWATER TREATMENT PLANT

PROJECT TITLE

INDOOR AIR PROGRAM
3027 EAST WASHINGTON STREET
PHOENIX, ARIZONA

PROJECT MANAGER	DEPARTMENT MANAGER	DESIGNER	CHECKED
	R. MONGRAIN	R. KOSCIOLEK	
SHEET TITLE		PHASE/TASK NUMBER	DRAWN BY
INDOOR AIR SAMPLING LOCATIONS		.0000.00210	R. KOSCIOLEK
		PROJECT NUMBER	FIGURE
		05445003	X

EPA Indoor Air Results

Indoor Air Data for Tetrachloroethene (PCE) – March 9, 2011 Sampling

Residential Air Regional Screening Level (2011)	0.41 ug/m ³	
Industrial Air Regional Screening Level (2011)	2.1 ug/m ³	
Sample Location		
Front West Office Location	12 ug/m ³	
Front Central Office Location	42 ug/m ³	
Front East Office Location	69 ug/m ³	
Chemical Handling Room	40 ug/m ³	
Ultrasonic Test Room (Main Area)	150 ug/m ³	
Ultrasonic Test Room (Secondary)	120 ug/m ³	
General Area	27 ug/m ³	
Outside (Ambient Conditions)	0.4 ug/m ³	

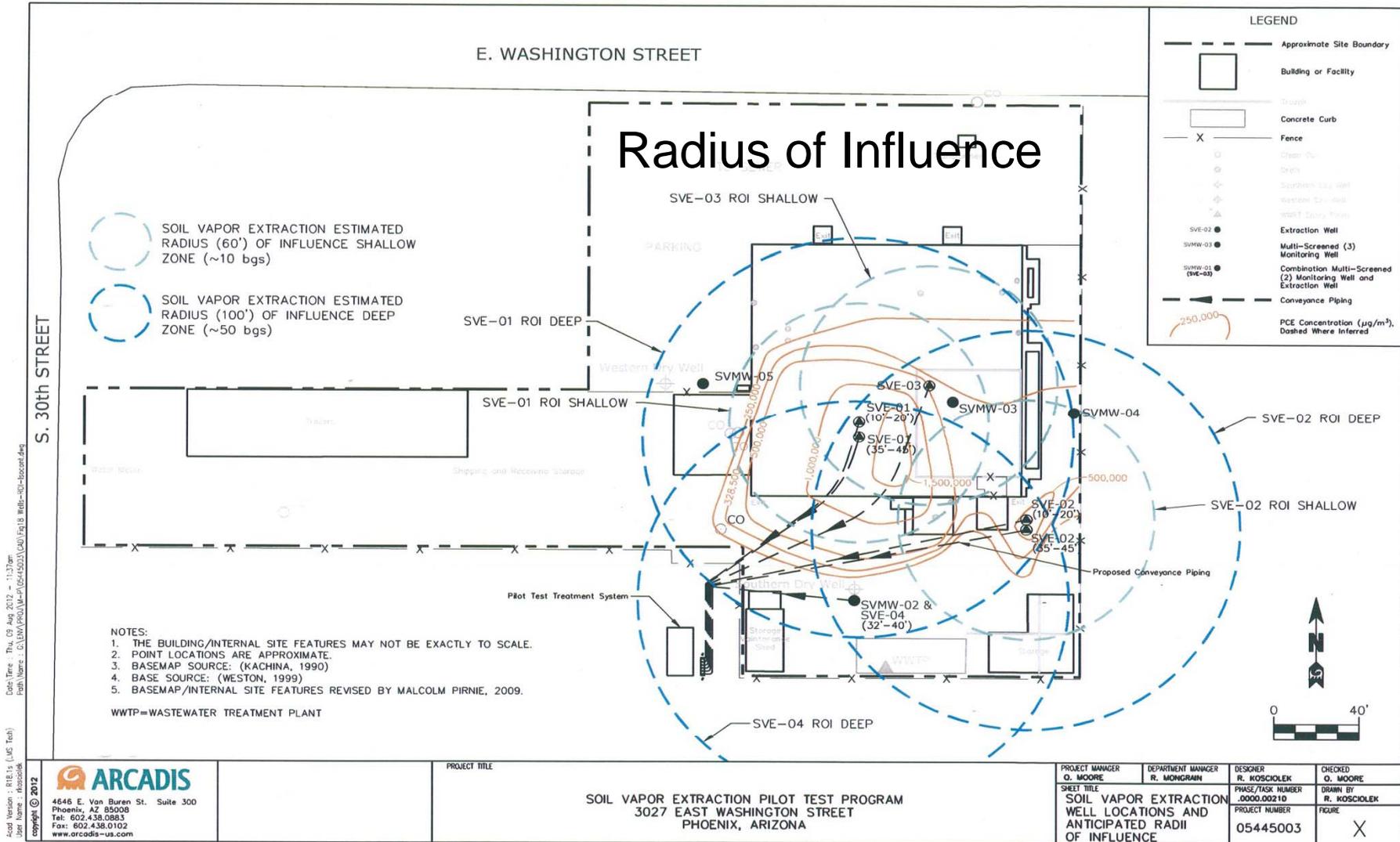
Indoor Air Data for Tetrachloroethene (PCE)- July 3rd Sampling-Preliminary Results

Residential Air Regional Screening Level (2012)	9.4 ug/m ³	
Industrial Air Regional Screening Level (IARSLs) (2012)	47.2 ug/m ³	
Sample Location		
Front Central Office Location	<IARSL	
Front East Office Location	<IARSL	
Chemical Handling Room	*	
Ultrasonic Test Room (Main Area)	*	
General Area	<IARSL	
Outside (Ambient Conditions)	<IARSL	
* Samples required dilution due to high detected concentrations of isopropyl alcohol (used in the facility operations). This resulted in an elevated reporting limit for PCE. Areas re-sampled on July 28 th .		

SVE Installation

- Soil Vapor Extraction (SVE) wells, Soil Vapor Monitoring wells and conveyance piping installed in June/July 2012
- SVE Pilot Study to begin in September 2012.
- Soil Vapor Extraction System to remediate soil and soil gas Volatile Organic Compounds (VOCs) to be fully operational in early 2013

SVE Layout





Contact Information

Brian Stonebrink

Project Manager- M52 OU2

Federal Projects Unit

Arizona Department of Environmental
Quality

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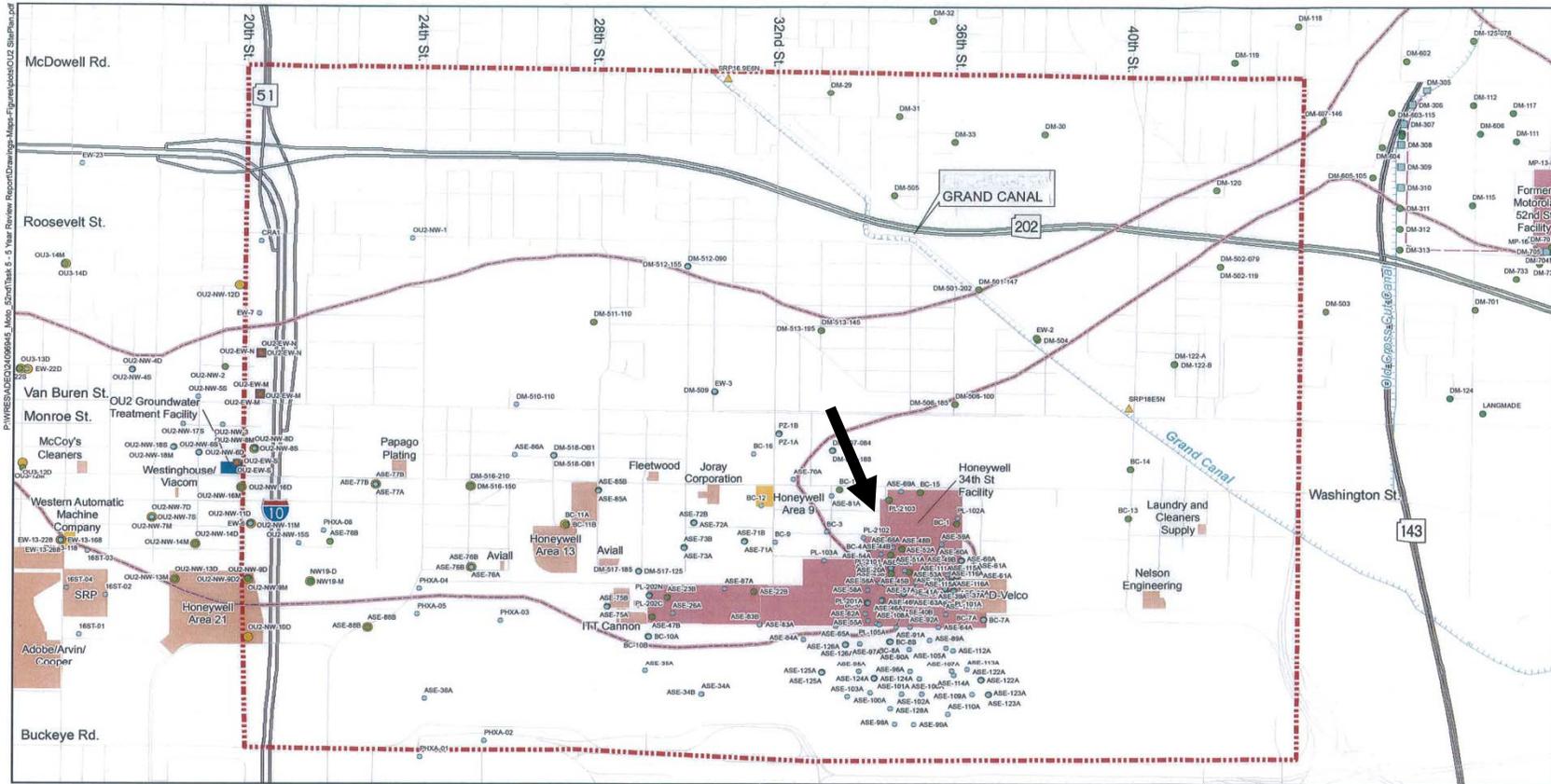
HONEYWELL 34TH STREET INDOOR AIR VAPOR INTRUSION ASSESSMENT UPDATE



**Motorola 52nd Street
Superfund Site
Honeywell 34th Street Indoor Air Vapor
Intrusion Assessment Update**

**Community Informational Group Meeting
August 16, 2012**





Legend

- | | | |
|--|---|--|
| <ul style="list-style-type: none"> OU Boundary Inferred Extent of VOCs Exceeding AWQS Based on 2009 Data Highway Road Canal Dual-Wall Pipeline | <p>Project Facilities</p> <ul style="list-style-type: none"> Responsible Party Potentially Responsible Party Property Issued a Notice of Completion of Work Groundwater Treatment Plants | <p>Location of Wells</p> <ul style="list-style-type: none"> Monitoring Well in HSU A Monitoring Well in HSU B Monitoring Well in HSU D Extraction Well A Extraction Well B Extraction Well D SRP Well |
|--|---|--|

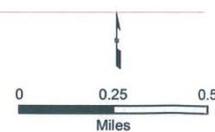


FIGURE 3-2
OU2 SITE PLAN
2011 Site-wide Five-year Review
Motorola 52nd Street Superfund Site

- Honeywell conducted an Indoor Air Vapor Intrusion Assessment for 7 Buildings at their 34th Street Facility
- Exposure pathway evaluated as part of the Remedial Investigation based on Low risks identified in Risk Assessment and previous chemical usage

Project Schedule

- July 19, 2011 Site Walk with ADEQ and EPA- Sampling locations finalized
- Indoor Air Vapor Intrusion Work Plan Approval March 2012
- April 2012 Building Survey
- May 2012 Sampling Performed
- May 8-10 ADEQ performed Split Sampling at Building 102

Indoor Air, Outdoor Air & Sub-Slab



Vapor Intrusion Building 102 Sub-Slab Results

Building 102 Sub-Slab Samples - May 10, 2012

Contaminant	Result	ADEQ Split	Units
1,1,2,2-Tetrachloroethane	6.14	<.89	$\mu\text{g}/\text{m}^3$
1,1,2-Trichloroethane	4.88	<.55	$\mu\text{g}/\text{m}^3$
1,1-Dichloroethane	3.62	<.41	$\mu\text{g}/\text{m}^3$
1,2-Dichloroethane	3.62	<.45	$\mu\text{g}/\text{m}^3$
Tetrachloroethene (PCE)	64.6	48.1	$\mu\text{g}/\text{m}^3$
Trichloroethene (TCE)	24.4	27.9	$\mu\text{g}/\text{m}^3$
Vinyl chloride	2.29	<.41	$\mu\text{g}/\text{m}^3$

Vapor Intrusion Bldg 102 Indoor Air Results

Building 102 Indoor Air Samples - May 10, 2012

Industrial Air Regional Screening Levels (IARSL)

Contaminant	Result	ADEQ Split	Units	IARSL	Exceed IARSL
1,1,2,2-Tetrachloroethane	0.105	<.89	µg/m ³	0.21	No
1,1,2-Trichloroethane	0.0832	<.55	µg/m ³	0.77	No
1,1-Dichloroethane	0.0618	<.41	µg/m ³	7.7	No
1,2-Dichloroethane	0.0766	<.45	µg/m ³	0.47	No
Tetrachloroethene (PCE)	0.127	<.75	µg/m ³	47	No
Trichloroethene (TCE)	0.0918	<.64	µg/m ³	3	No
Vinyl chloride	0.039	<.41	µg/m ³	2.8	No

Outdoor Air

- 12 Outdoor (Ambient) Samples collected
- All samples for PCE $< 0.18 \text{ ug/m}^3$
- 11 samples for TCE $< 0.3 \text{ ug/m}^3$
- 1 sample for TCE of 3.67 but $< 0.64 \text{ ug/m}^3$ in ADEQ's Split sample

Conclusions

- All of the Indoor Air samples for the Motorola Contaminants of Concern (COCs) were below the Industrial Air Regional Screening Levels



Contact Information

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OPERABLE UNIT 1 UPDATE



Motorola 52nd Street Superfund Site

Operable Unit 1
Update - August 16, 2012



**Arizona Department of
Environmental Quality**



**U.S. Environmental
Protection Agency, Region 9**

TODAY'S PURPOSE:

- 1) UPDATE - OU1 REMEDIATION EFFECTIVENESS for 2011**
- 2) UPDATE - BEDROCK PILOT STUDY**
- 3) UPDATE - END USE**
- 4) ON-GOING CHALLENGES**
- 5) FUTURE ITEMS**



Scale



Operable Unit 1 Area
Motorola 52nd Street Superfund Site
Phoenix, Arizona



OU1 Effectiveness Update - 2011

Freescale continues to operate the treatment system with ADEQ and EPA oversight:

- 127.9 million gallons of water treated in 2011
- Approximately 683 pounds of volatile organic compounds (VOCs) removed in 2011
- Estimated 21,861 pounds of VOCs removed since 1993 start-up
- Groundwater monitoring results indicate treatment plant is working as designed.
- Discharge to City of Phoenix Sewer

OU1 Bedrock Study

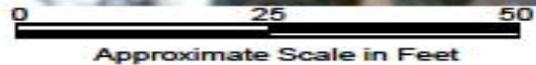
- The past studies determined VOCs had migrated downward into bedrock underlying the M52 site facility.
- In 2008, a bedrock pilot study was initiated to collect additional bedrock permeability information and to evaluate VOC removal potential from bedrock fractures.

Bedrock Study - As of 2011

- 233 lbs VOC removed from 377,748 gallons of water
- Well pumps for 30 minutes and then recovery is about 2 hours – average rate- 1 gallon per minute
- Future Action: More wells to be installed



Legend



- ◆ Existing Extraction Well
- Existing Monitoring Well
- ◆ New Bedrock Extraction Well
- New Bedrock Monitoring Well

FIGURE 1
NEW WELL LOCATIONS

CLEAR CREEK ASSOCIATES 

Bedrock Pilot Study
Operations Report
July 2011

Beneficial end use still important

- Now: City of Phoenix Sewer Discharge
- Future: On-going Evaluation
 - Surface water discharge
 - Subsurface injection

- The OU1 Treatment Plant is a Temporary Remedy - Interim Remedy
- Extraction of contaminants from bedrock is very difficult
- Further evaluate groundwater extraction at the Old Cross Cut Canal (New Wells)
- TCE and PCE concentration increase at certain wells needs further investigation
- End use determination still under study

OU1 Future Items

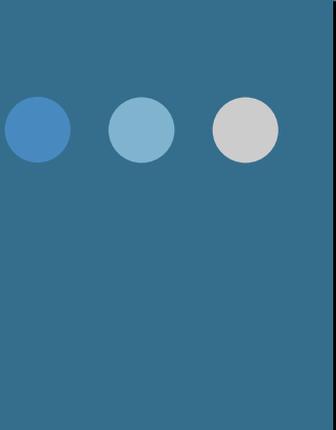
- Effectiveness Report Response to Agencies
- Semi-Annual Sampling Round - September
- Semi-Annual Progress Report – Jan.–June 2012
- Evaluation of Courtyard/Acid Treatment Plant Area
- OU1 Vapor Intrusion
- Final Remedial Investigation/Feasibility Study
- Final Record of Decision (ROD)

- **QUESTIONS**

Agency Comments

- ADEQ
- EPA

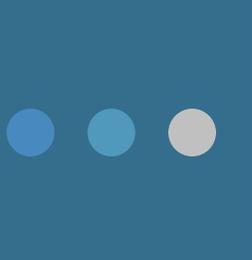
UPDATE: INDOOR AIR & SUB-SLAB SAMPLING



Update: Indoor Air & Sub-Slab Sampling – Motorola 52nd Street Site

Phoenix, AZ
August 2012

Gerald (Gerry) Hiatt, Ph.D.
U.S. EPA, Region 9
415-972-3064
hiatt.gerald@epa.gov

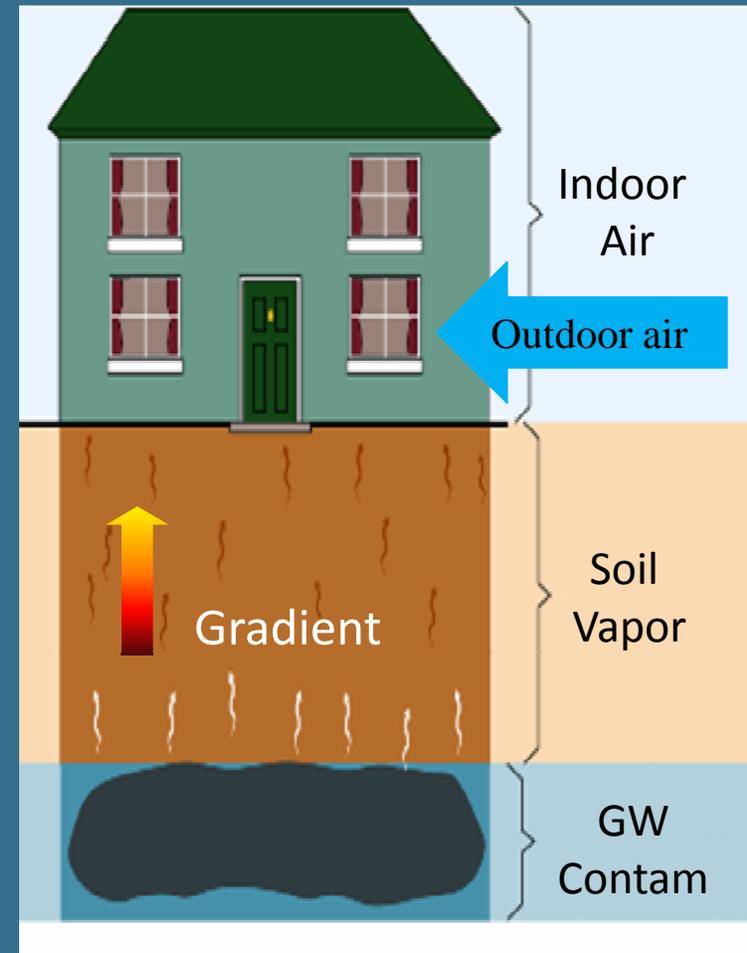


Outline

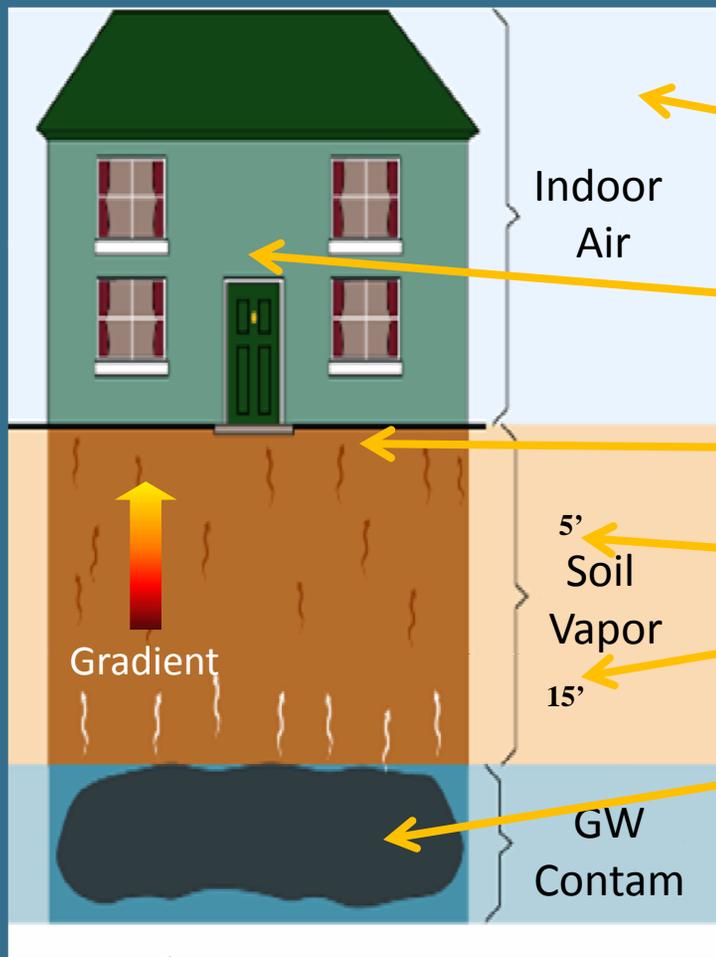
- Vapor intrusion basics
- New TCE toxicity info & soil gas screening levels (SGHHSLS)
 - Extension of vapor intrusion screening area
- Area-by-area presentation of results to date

Soil Gas and Indoor Air

- Vapor intrusion (VI) = soil gas entering overlying buildings
- Questions to address:
 - Is VI happening?
 - If so, are indoor air exposures of potential health concern?



Multiple Lines of Evidence



Vapor Intrusion?

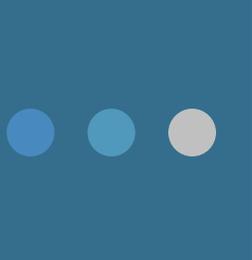
- Outdoor air
- Indoor air
- Sub-slab
- Soil gas
- Groundwater

Use of Risk Range - Homes

Trichloroethylene (TCE) Protective Risk Range (RR):

0.4 – 2 $\mu\text{g}/\text{m}^3$

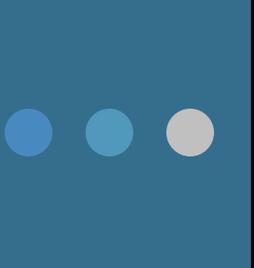
- $< 0.4 \mu\text{g}/\text{m}^3$ – Inhalation Risk Screening Level (IRSL)
 - Less than 1 in one-million lifetime cancer risk
 - No remediation unless potential for future VI
- $0.4 - 2 \mu\text{g}/\text{m}^3$
 - Low risk: 1 - 5 in one-million lifetime cancer risk
 - Consider remediation if potential for future VI
- EPA's Goal: residential exposures less than $2 \mu\text{g}/\text{m}^3$
 - $> 2 \mu\text{g}/\text{m}^3$ risks start to increase for both non-cancer effects and cancer



SGHHSs Updated

Soil Gas Human Health Screening Levels (SGHHSs)

- Used to help define areas for indoor air/sub-slab sampling
- New: SGHHSs updated to incorporate revised TCE risk screening level ($0.4 \mu\text{g}/\text{m}^3$ lower end)
- TCE SGHHSs:
 - Residential: $190 \mu\text{g}/\text{m}^3$
 - Commercial/Industrial: $2,500 \mu\text{g}/\text{m}^3$
- Impact: Expanded areas for indoor air/sub-slab investigation



Updated IA & SS Results

- 3 Sampling Events:
 - July 2011 / October 2011 / February 2012
 - 77 houses/apartments
 - 5 commercial/industrial buildings
 - 2 schools
- Indoor air & sub-slab data validated
- Results represent testing in individual homes
 - No addresses or specific locations identified
 - Protect privacy of volunteers

Vapor Intrusion Study Areas



Lindon Park (23 Residences)



TCE – Indoor Air (22):

- 10 residences ND
- 10 below $0.4 \mu\text{g}/\text{m}^3$ screening level
- 2 in $0.4 - 2 \mu\text{g}/\text{m}^3$ protective risk range

TCE - Sub-Slab (23):

- 5 sub-slabs non-detect
- 18 detections

IA/SS sampling extended:

- Brill Street
- South of Culver

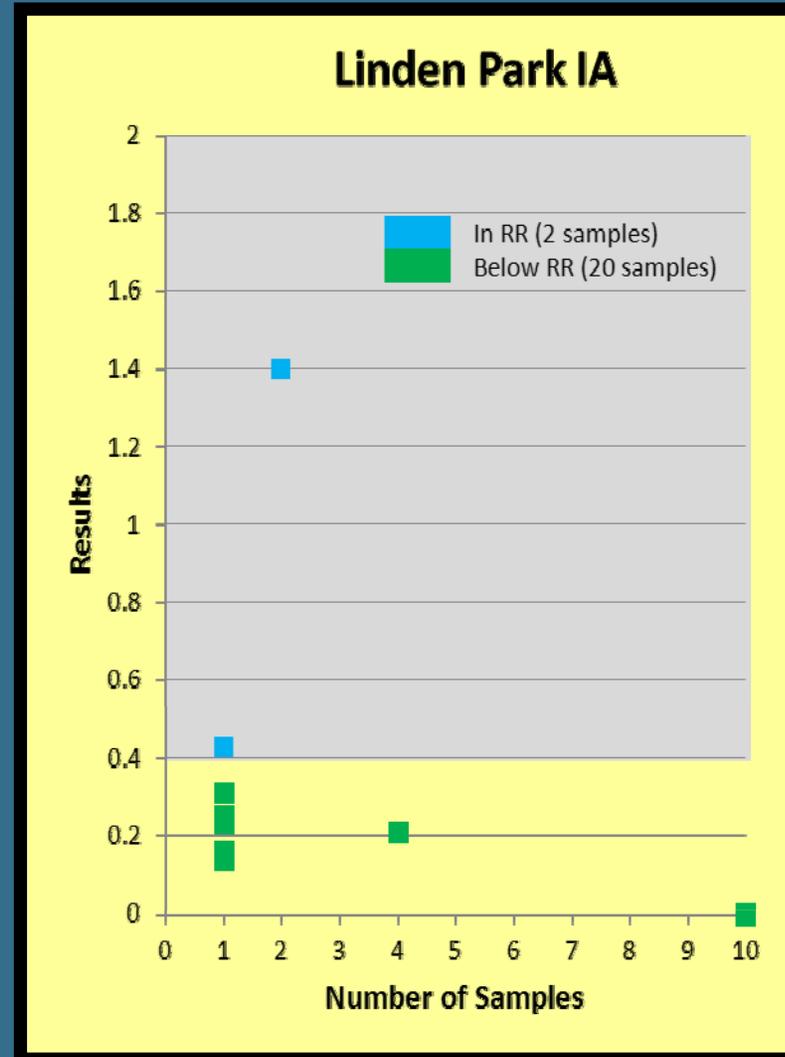
Updated TCE
9 SGHHS�

Lindon Park IA (23 Residences)



TCE – Indoor Air (22):

- 10 residences ND
- 10 below $0.4 \mu\text{g}/\text{m}^3$ screening level
- 2 in $0.4 - 2 \mu\text{g}/\text{m}^3$ protective risk range



McDowell Southside (25 Residences)



TCE – Indoor (24):

- 6 residences ND
- 9 below $0.4 \mu\text{g}/\text{m}^3$ screening level
- 7 within $0.4 - 2 \mu\text{g}/\text{m}^3$ protective risk range
- 2 above protective risk range

TCE - Sub-Slab (25):

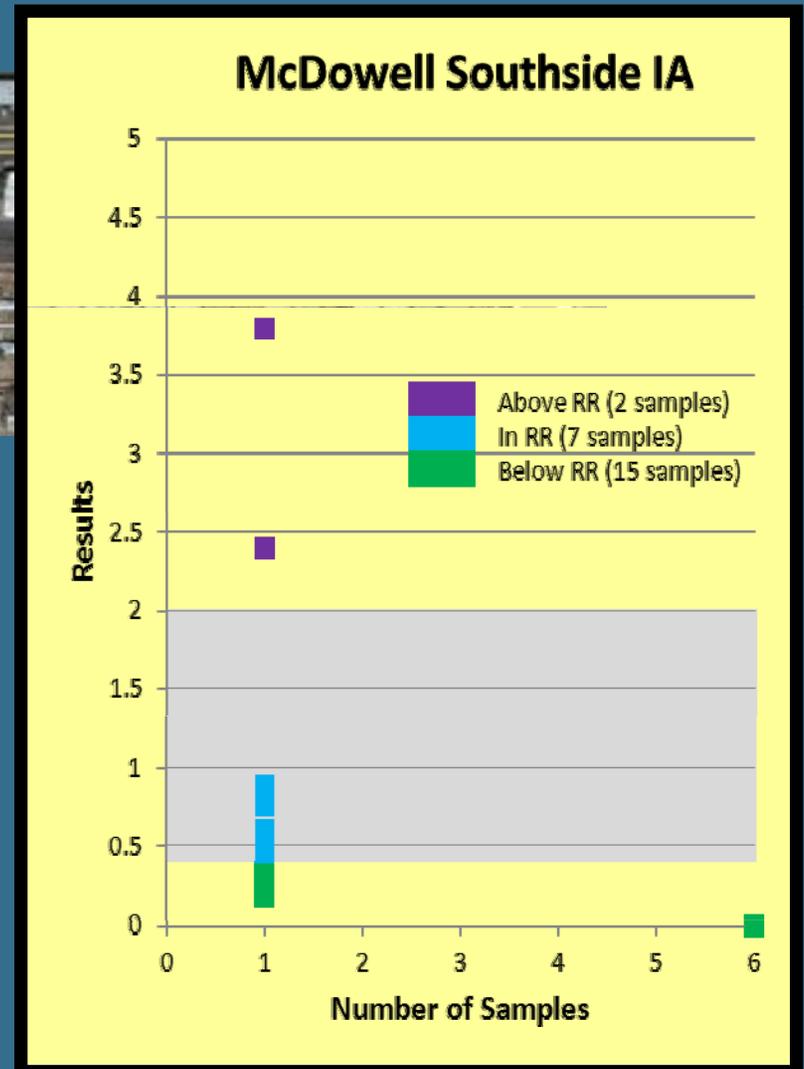
- 24 detections
- 1 building id'd for sub-slab mitigation
 - Elevated SS levels
- Additional residences identified to sample

McDowell Southside (25 Residences)



TCE – Indoor (24):

- 6 residences ND
- 9 below $0.4 \mu\text{g}/\text{m}^3$ screening level
- 7 within $0.4 - 2 \mu\text{g}/\text{m}^3$ protective risk range
- 2 above protective risk range



McDowell Northside (29 Residences)



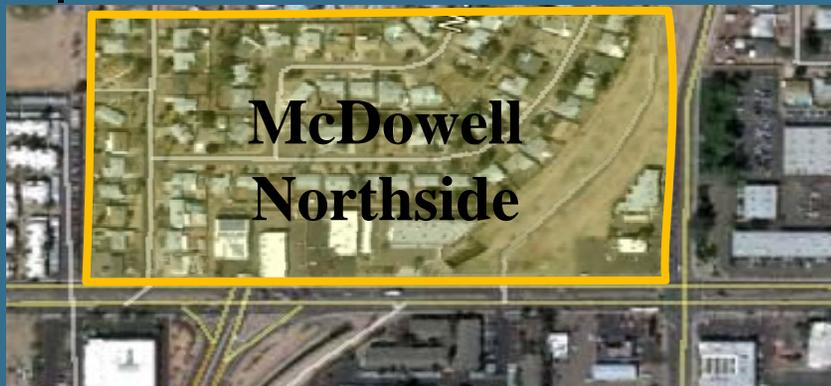
TCE – Indoor (29):

- 7 residences ND
- 6 below $0.4 \mu\text{g}/\text{m}^3$ screening level
- 5 within $0.4 - 2 \mu\text{g}/\text{m}^3$ protective risk range
- 11 above protective risk range

TCE - Sub-Slab (28):

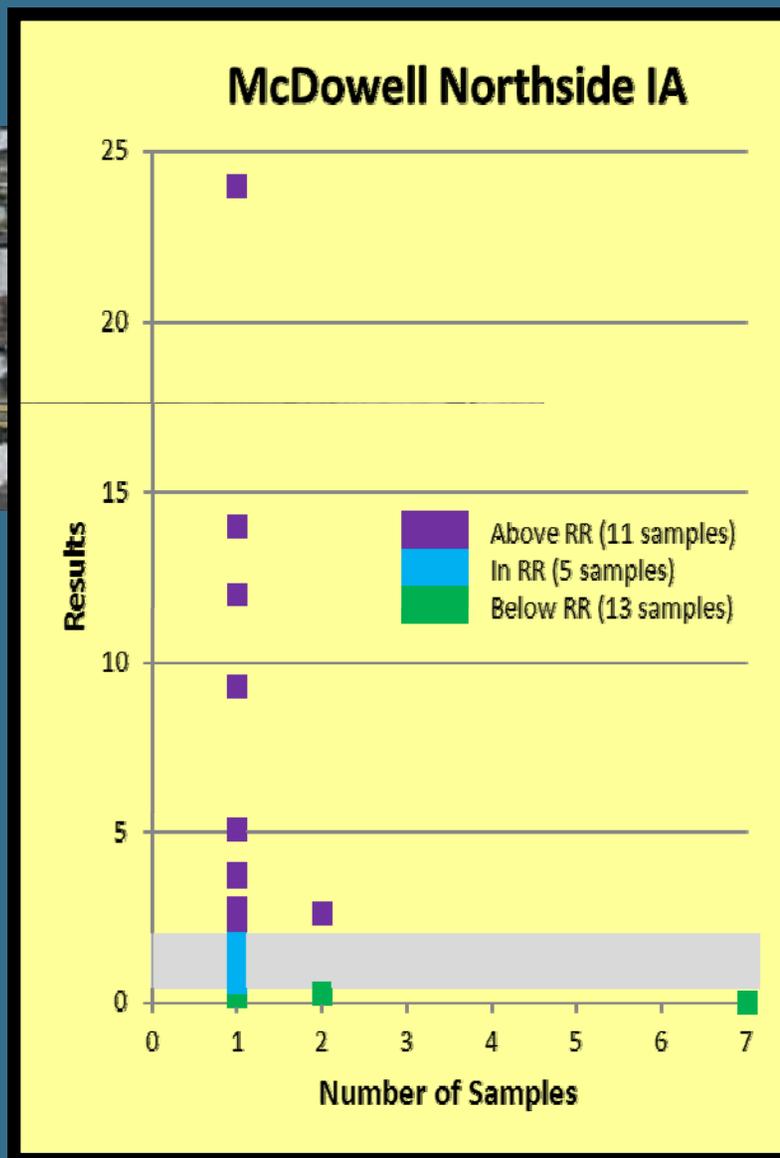
- 27 detections
- 15 buildings identified for sub-slab mitigation
 - Elevated SS levels
- Additional residences identified to sample

McDowell Northside (29 Residences)



TCE – Indoor (29):

- 7 residences ND
- 6 below $0.4 \mu\text{g}/\text{m}^3$ screening level
- 5 within $0.4 - 2 \mu\text{g}/\text{m}^3$ protective risk range
- 11 above protective risk range



Schools – Indoor Air

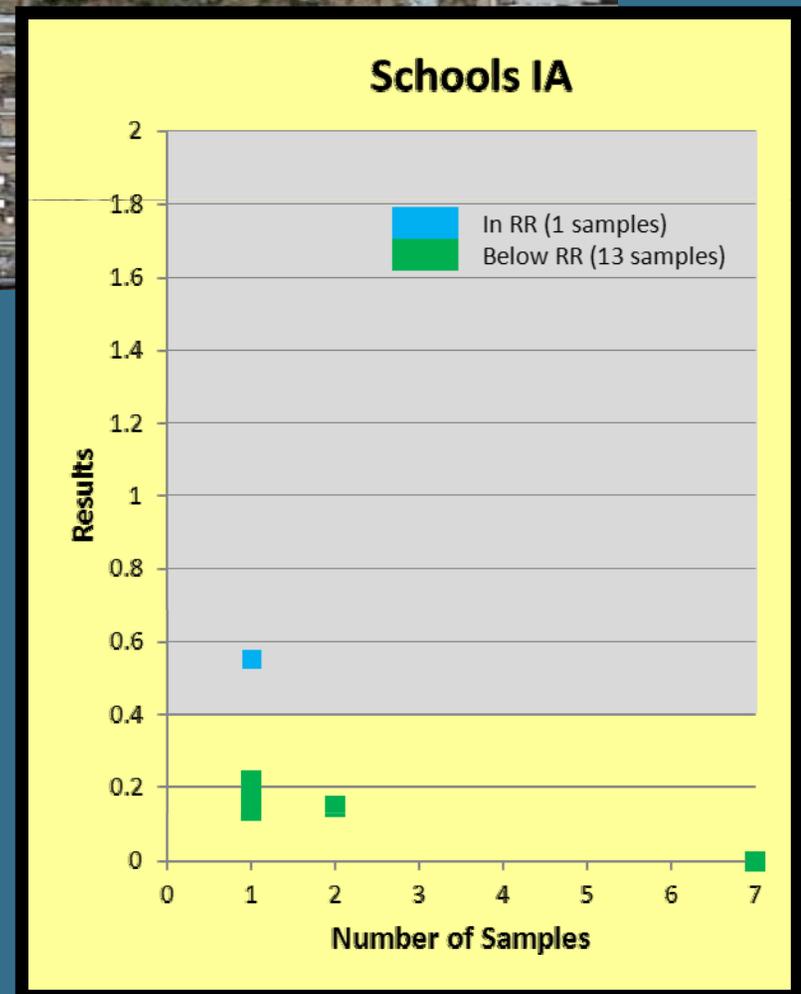


- Pre-school: 20 samples over 2 seasons
 - 17 samples ND for TCE
 - 1 TCE marginally within protective risk range (mechanical room; slab opening?)
- Elementary/High School: 10 samples over 2 seasons
 - 5 samples ND for TCE
 - All TCE below protective risk range

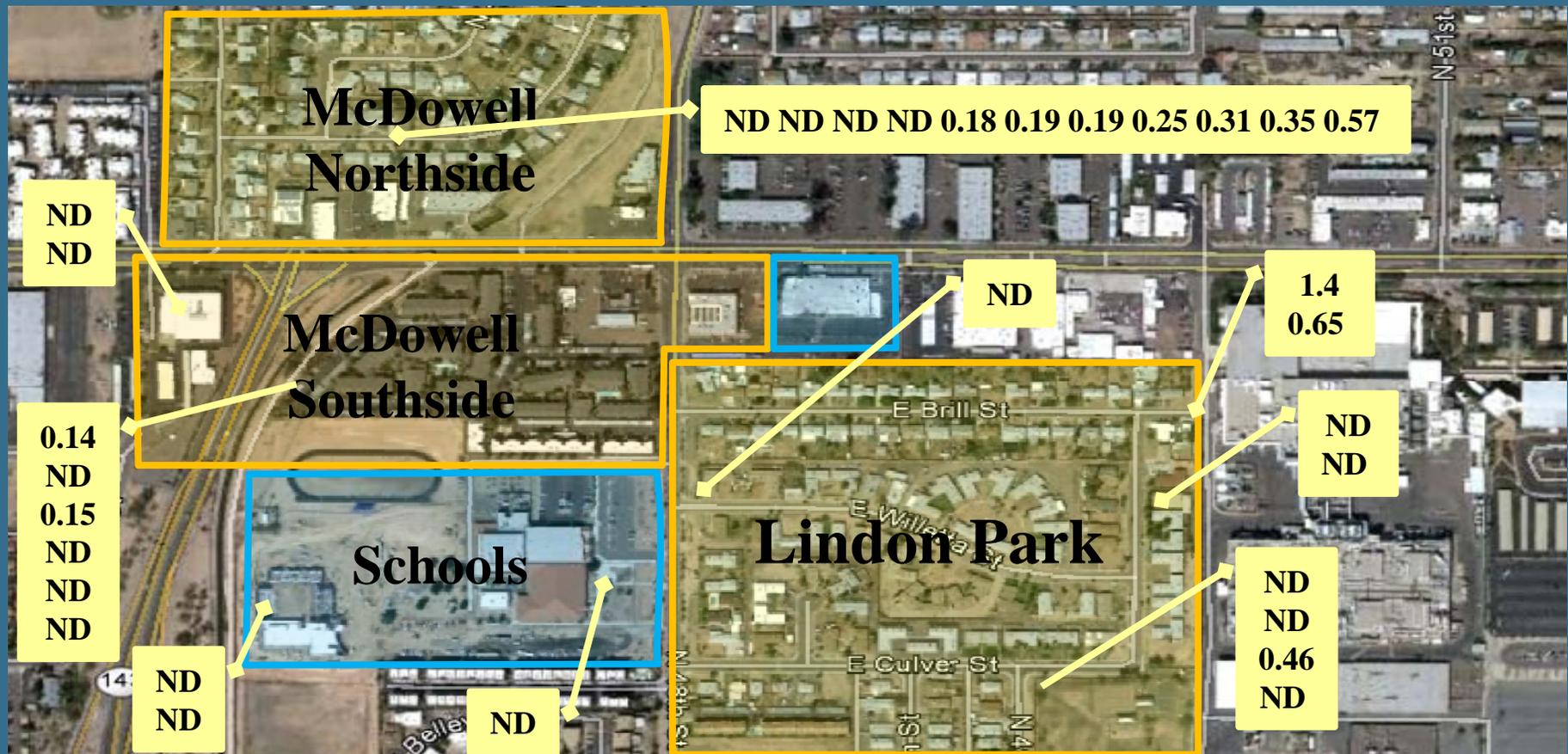
Schools – Indoor Air

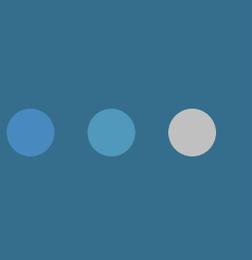


- Pre-school: 20 samples over 2 seasons
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 - 1 TCE marginally within protective risk range (mechanical room; slab opening?)
- Elementary/High School: 10 samples over 2 seasons
 - 5 samples ND for TCE
 - All TCE below protective risk range



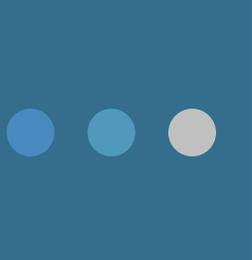
Outdoor Air Results





Summary

- Indoor air sampled – 75 residences:
 - TCE detected in 52; 23 ND
 - TCE range: ND – 24 $\mu\text{g}/\text{m}^3$
- Sub-slab soil gas sampled – 76 residences
 - TCE detected 69; 7 ND
 - TCE range: ND – 43,000 $\mu\text{g}/\text{m}^3$
- 17 buildings have been identified for mitigation using sub-slab depressurization system
 - 7 installations completed
- Outdoor air: ND – 1.4 $\mu\text{g}/\text{m}^3$



Conclusions & Comments

- TCE levels – either indoor air or sub-slab - prompted installation of sub-slab depressurization systems to address VI in some areas
- Another round of IA & SS sampling currently underway
- Additional residences added to sampling to expand area of investigation – based on revised soil gas screening levels



Thank You

QUESTIONS?

Outdoor Air Results



VAPOR INTRUSION TO INDOOR AIR INVESTIGATION AND FINDINGS

Vapor Intrusion to Indoor Air
Investigation and Findings
Motorola 52nd Street
Superfund Site

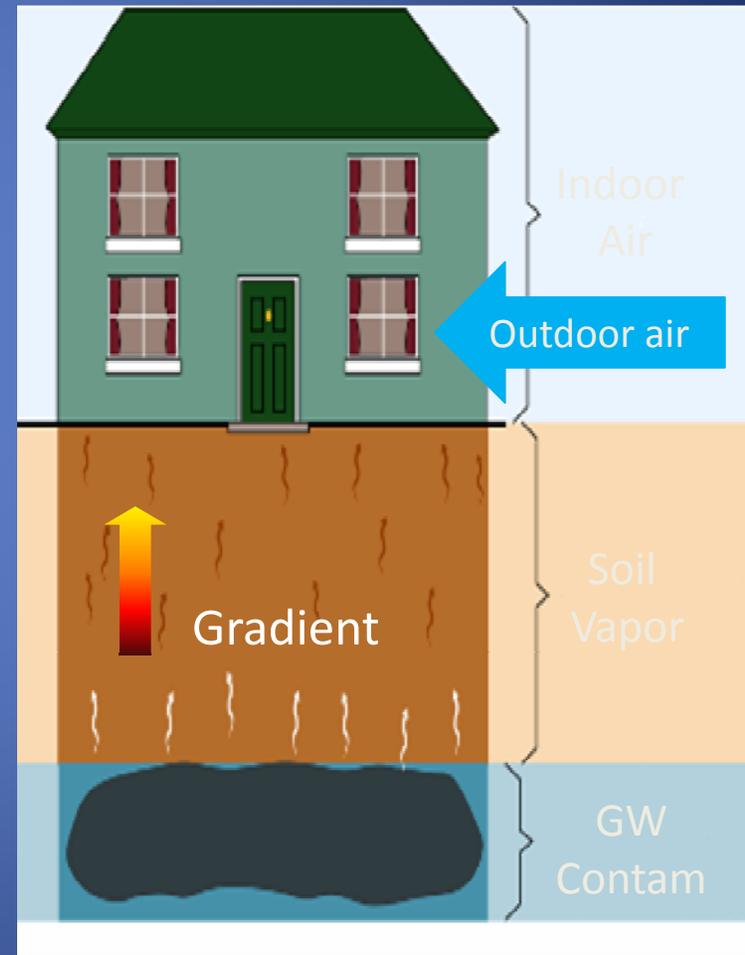
August 2012

Janet Rosati (415) 972-3165
(rosati.janet@epa.gov)

Vapor Intrusion Pathway

- Volatile organic compounds (VOCs) in the subsurface volatilize (become a gas) and migrate into the indoor air of overlying buildings.

Main VOC is TCE
(Trichloroethylene)









2011 7 26

Sampling Events

- Four rounds of sampling so far
 - July 2011
 - October 2011
 - February 2012
 - August 2012

July 2011



October 2011 and February 2012



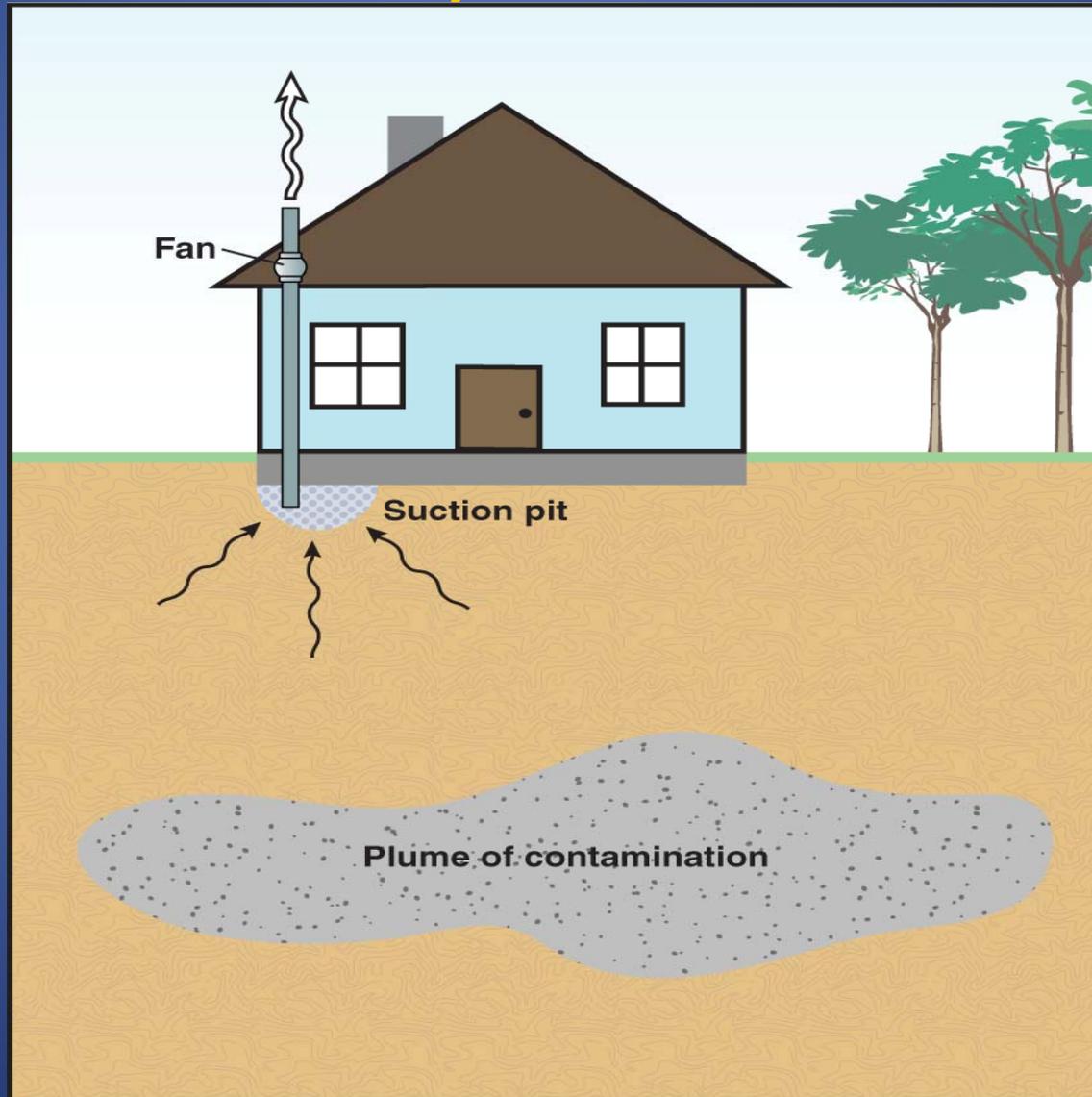
August 2012



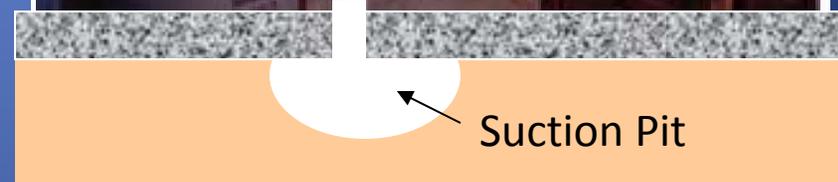
Summary of VI Investigation as of February 2012

- Sampled 77 residences, 5 commercial buildings and 2 schools representing areas where soil vapor exceeded screening levels
- 7 mitigation systems installed
- 2 have denied access
- 8 pending

Sub-slab depressurization system



Example Sub-Slab Depressurization System



ATTACHMENT 2
MEETING ATTENDEE LIST

Attendance

Date	FirstName	LastName	Affiliation
8/16/2012	Wendoly	Abrego	PRC
8/16/2012	Anayensi	Almaraz	Bioscience High School
8/16/2012	Rene	Chase-Dufault	resident/co-chair
8/16/2012	Chloe	Cline	Bioscience High School
8/16/2012	David	Cooper	EPA
8/16/2012	Teresita	Figueroa	Bioscience High School
8/16/2012	Wendy	Flood	ADEQ
8/16/2012	Faith	Frias	Bioscience High School
8/16/2012	Jennifer	Haro	Bioscience High School
8/16/2012	Ryan	Heisiel	Bioscience High School
8/16/2012	Judy	Heywood	APS
8/16/2012	Gerald	Hiatt	EPA
8/16/2012	Les	Holland	resident
8/16/2012	Doug	Hulmes	Shaw
8/16/2012	Troy	Kennedy	Honeywell
8/16/2012	Mike	Kraeski	ERM West, Inc.
8/16/2012	Shoshana	Kroeger	Bioscience High School
8/16/2012	Tasha	Lewis	CH2M HILL
8/16/2012	Robert	Livermore	ERM West, Inc.
8/16/2012	Ruth Ann	Marston	Phoenix Elementary
8/16/2012	Jenn	McCall	Freescale
8/16/2012	Carlos	Melendez	Bioscience High School
8/16/2012	Alejandro	Melo	Bioscience High School
8/16/2012	Wayne	Miller	ADEQ
8/16/2012	Rob	Mongrain	Arcadis
8/16/2012	Mary	Moore	resident
8/16/2012	Barbara	Murphy	Freescale consultant
8/16/2012	Ryan	Nebeker	Bioscience High School
8/16/2012	William	Neese	ADEQ consultant
8/16/2012	Tom	Padgett	resident
8/16/2012	Kassandra	Payan	Bioscience High School
8/16/2012	Enrique	Po-pe	Bioscience High School
8/16/2012	Cesar	Quintin	Bioscience High School
8/16/2012	Octavio	Rodriguez	Bioscience High School
8/16/2012	Abigail	Rodriguez	Star Shine Academy
8/16/2012	Janet	Rosati	EPA
8/16/2012	Iridian	Ruiz	Bioscience High School
8/16/2012	Bill	Ruoff	URS Corporation
8/16/2012	Richard	Rushforth	TAG advisor
8/16/2012	Wayne	Schurg	business owner
8/16/2012	Clarissa	Smith	Bioscience High School
8/16/2012	Garrett	Smith	AZ Teachers for Justice
8/16/2012	Kimberly	Smith	resident
8/16/2012	Nadia	Smith	Bioscience High School
8/16/2012	Donn	Stoltzfus	City of Phoenix
8/16/2012	Brian	Stonebrink	ADEQ
8/16/2012	Tom	Suriano	Freescale consultant
8/16/2012	Tzipi	Turner	Bioscience High School
8/16/2012	Sara	Turner	Bioscience High School
8/16/2012	Tony	Ward	ERM West, Inc.
8/16/2012	Jared	Washburn	Bioscience High School
8/16/2012	Sarah T.	Wilkinson, PhD	U of A Superfund Program
8/16/2012	Martin	Zeleznik	EPA