ADEQ Arizona Department of Environmental Quality

MEETING MINUTES

Park-Euclid/7th Street & Arizona Avenue
Water Quality Assurance Revolving Fund (WQARF) site
Community Advisory Board (CAB) Meeting

Tuesday, May 20, 2014
5:30 - 7:30 p.m.
Joel D. Valdez Main Library
101 N. Stone Ave., 2nd Floor, Catalina Room
Tucson, Arizona 85701

MINUTES

CAB Members Present: Jacky Turchick; Menachem Turchick; Richard Byrd; Bill Richards; Freya Eddy; Steven Turner

CAB Members Absent: Jonathan Salvatierra; Keith Bagwell

ADEQ Staff Present: Scott Green, Project Manager; Delfina Olivarez, Community Involvement Coordinator; Hazel Cox, Hydrologist; Matt Narter, Hydrologist; and the following two consultants to ADEQ: Mike Barden (Hydro Geo Chem) and Armando Jimenez (URS)

Members of Public Present: Mark Verhougstraete; Harrison Smith; Diana Lett; David Jonathas; Ted Warmbrand, Barrio San Antonio Neighborhood Association; Albert Lundquist; Harrison Smith, Dunbar-Spring Neighborhood Association; Erik Shapiro, Dunbar-Spring Neighborhood Association; Victoria Hermosilla

1. Welcome and Introductions
The meeting began at 5:35 p.m. Ms. Olivarez welcomed the group and Ms. Turchick, Co-Chair, conducted introductions.

2. Approval of Meeting Minutes – 11/14/13 and 2/14/14
Ms. Eddy motioned to accept both meeting minutes; Mr. Byrd seconded; motioned passed.

3. CAB Charter and Co-Chair (Discussion/Vote)
Ms. Turchick asked for a vote on CAB member applicants present: Mark Verhougstraete, Harrison Smith, Diana Lett, and David Jonathas. Ms. Turchick asked for a vote to accept; Mr.

Richards motioned; Mr. Byrd seconded; all applicants voted in. Ms. Turchick asked for a vote on Co-Chairs; Mark Verhougstraete volunteered. Ms. Lett motioned; Menchamen seconded. CAB will review/vote on charter at next meeting.

4. Update on Park-Euclid (PE) Feasibility Study (FS) (see attached presentation)

Mr. Green discussed the PE site FS. Ms. Lett asked what URS stands for and what their relation is to the site. Mr. Green replied that URS is the consultant for the potentially responsible party. Ms. Turchick asked to point out on the map the proximity of PE to the University of Arizona. Ms. Cox showed everyone on the map and Mr. Green talked about the direction of groundwater flow and the fact that the University wells are non-detect.

5. 7th Street & Arizona Avenue Proposed Remedial Action Plan (PRAP) discussion (see attached presentation)

Mr. Green discussed 7th Street & Arizona Avenue and the PRAP for the site.

6. Question & Answer Session for Public Comments on the PRAP

Ms. Turchick asked about the level of remediation with respect to land use, Mr. Green replied non-residential standards apply to the site and that a Declaration of Environmental Use Restriction (DEUR) will be applied to the site.

7. *Call to the Public

Ms. Eddy asked how long the 7th Street & Arizona Avenue site has been a WQARF site. Consultant replied since 2000. Ms. Lett asked for open meeting law (OML) information. Ms. Olivarez will email the CAB OML information.

8. Next Meeting Date/Agenda Discussion

Next meeting tentatively scheduled for September 29, 2014.

9. Adjournment

Ms. Turchick motioned to adjourn; Mr. Richards seconded; meeting adjourned at 7:30 p.m.

This meeting was recorded on a digital device as a record of the proceedings.
To listen to a recording, or for additional information about the content of this meeting, contact:
ADEQ: Caroline Oppleman at 602-771-6890.

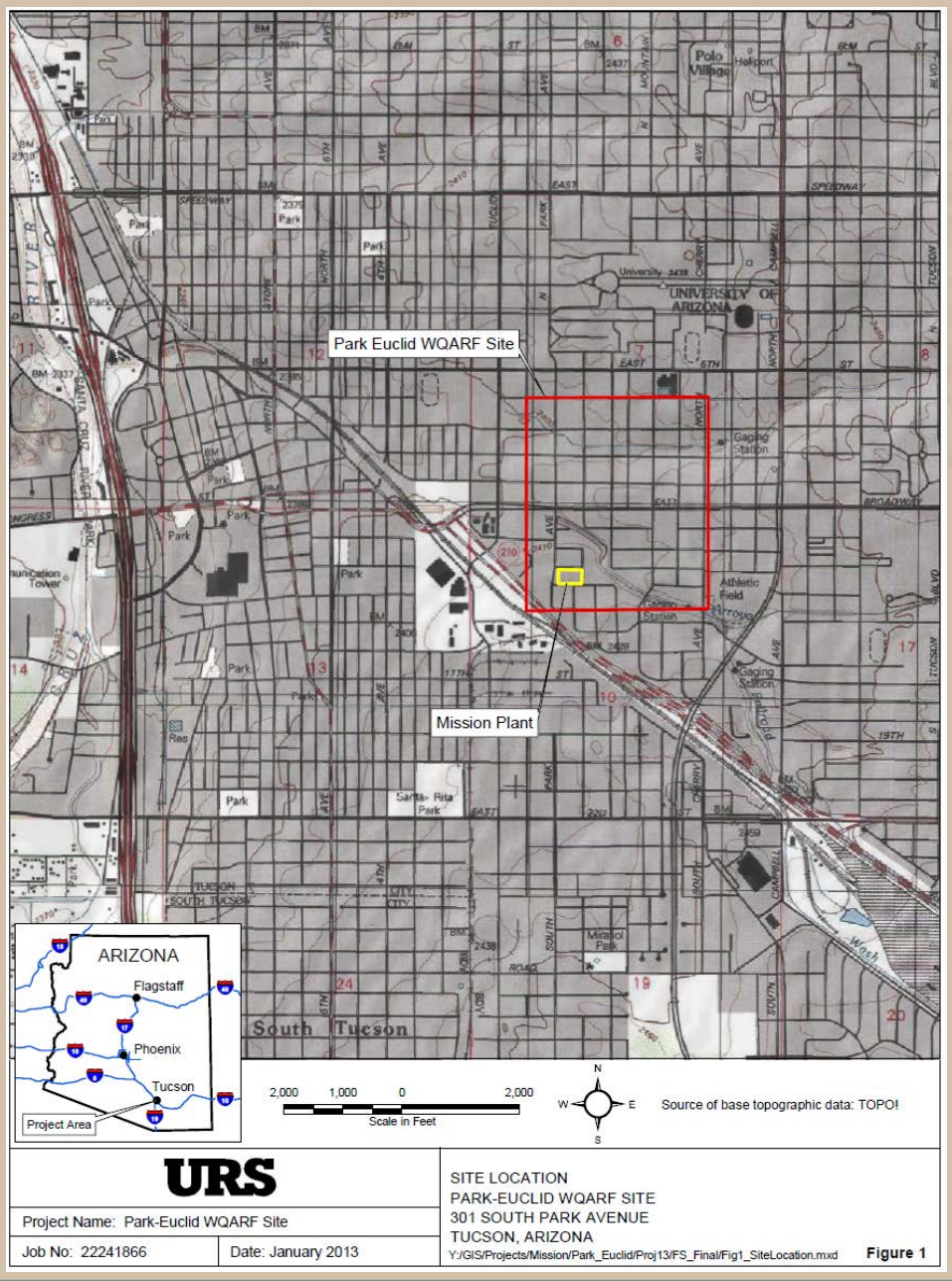
Park-Euclid WQARF Site

Brief Feasibility Study Update

Scott R. Green, Project Manager

Southern Regional Office

ADEQ Arizona Department of Environmental Quality



URS

Project Name: Park-Euclid WQARF Site

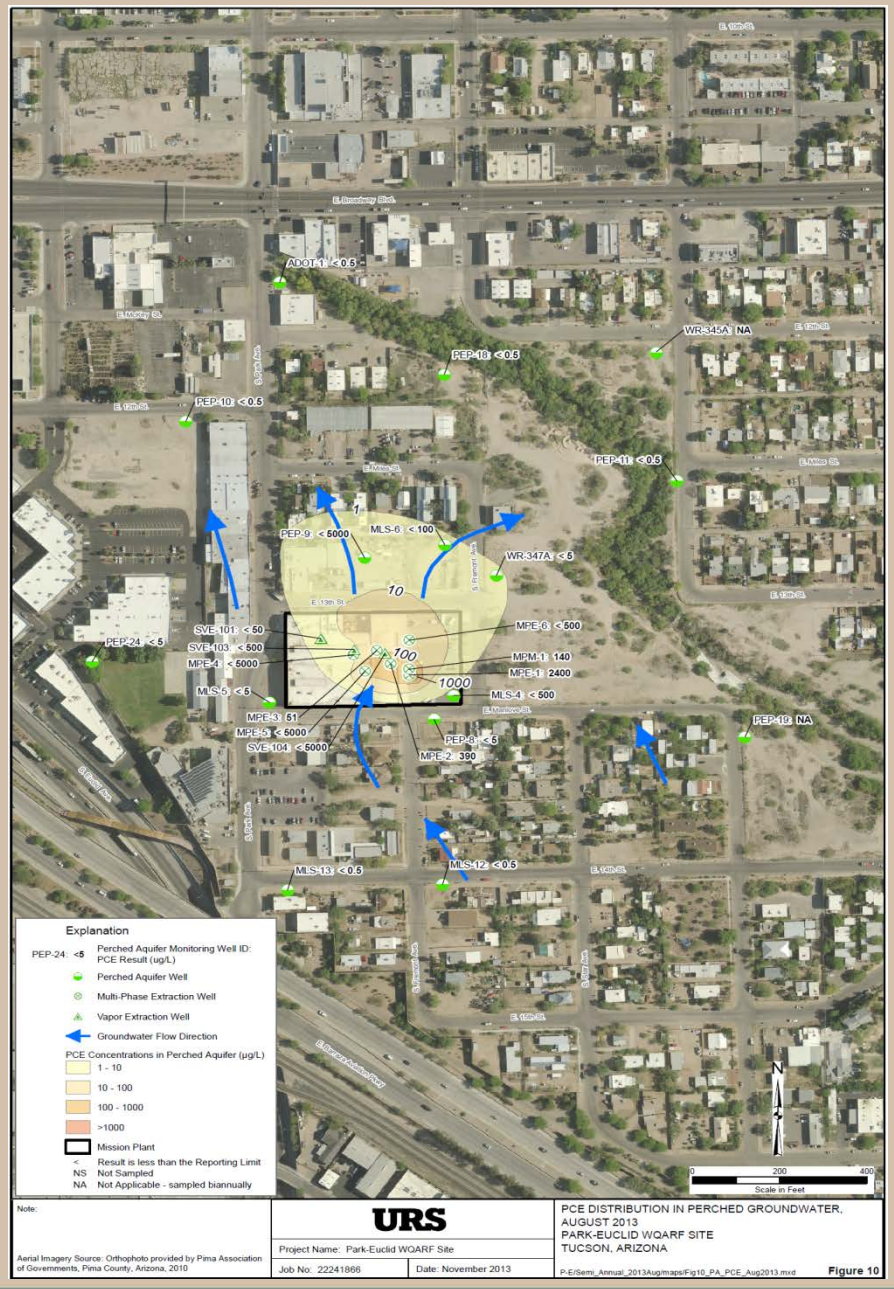
Job No: 22241866 | Date: January 2013

SITE LOCATION
PARK-EUCLID WQARF SITE
301 SOUTH PARK AVENUE
TUCSON, ARIZONA
Y:/GIS/Projects/Mission/Park_Euclid/Proj13/FS_Final/Fig1_SiteLocation.mxd

Figure 1

ADEQ Arizona Department of Environmental Quality

ADEQ Arizona Department of Environmental Quality



Note:

Aerial Imagery Source: Orthophoto provided by Pima Association of Governments, Pima County, Arizona, 2010

URS

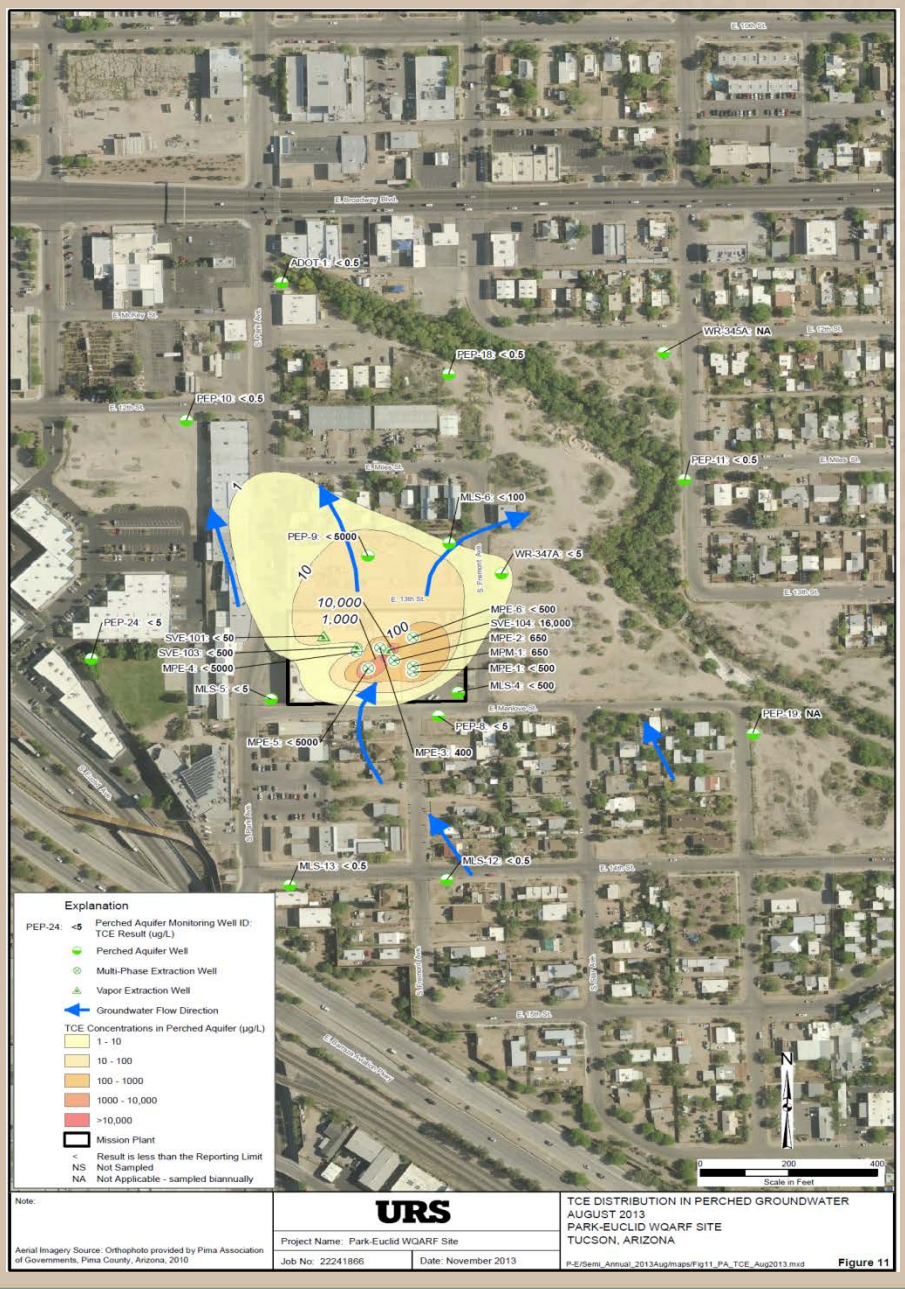
Project Name: Park-Euclid WQARF Site

Job No: 22241866 | Date: November 2013

PCE DISTRIBUTION IN PERCHED GROUNDWATER, AUGUST 2013
PARK-EUCLID WQARF SITE
TUCSON, ARIZONA

P-E/Semi_Annual_2013Aug/maps/Fig10_PA_PCE_Aug2013.mxd

Figure 10



Note:

Aerial Imagery Source: Orthophoto provided by Pima Association of Governments, Pima County, Arizona, 2010

URS

Project Name: Park-Euclid WQARF Site

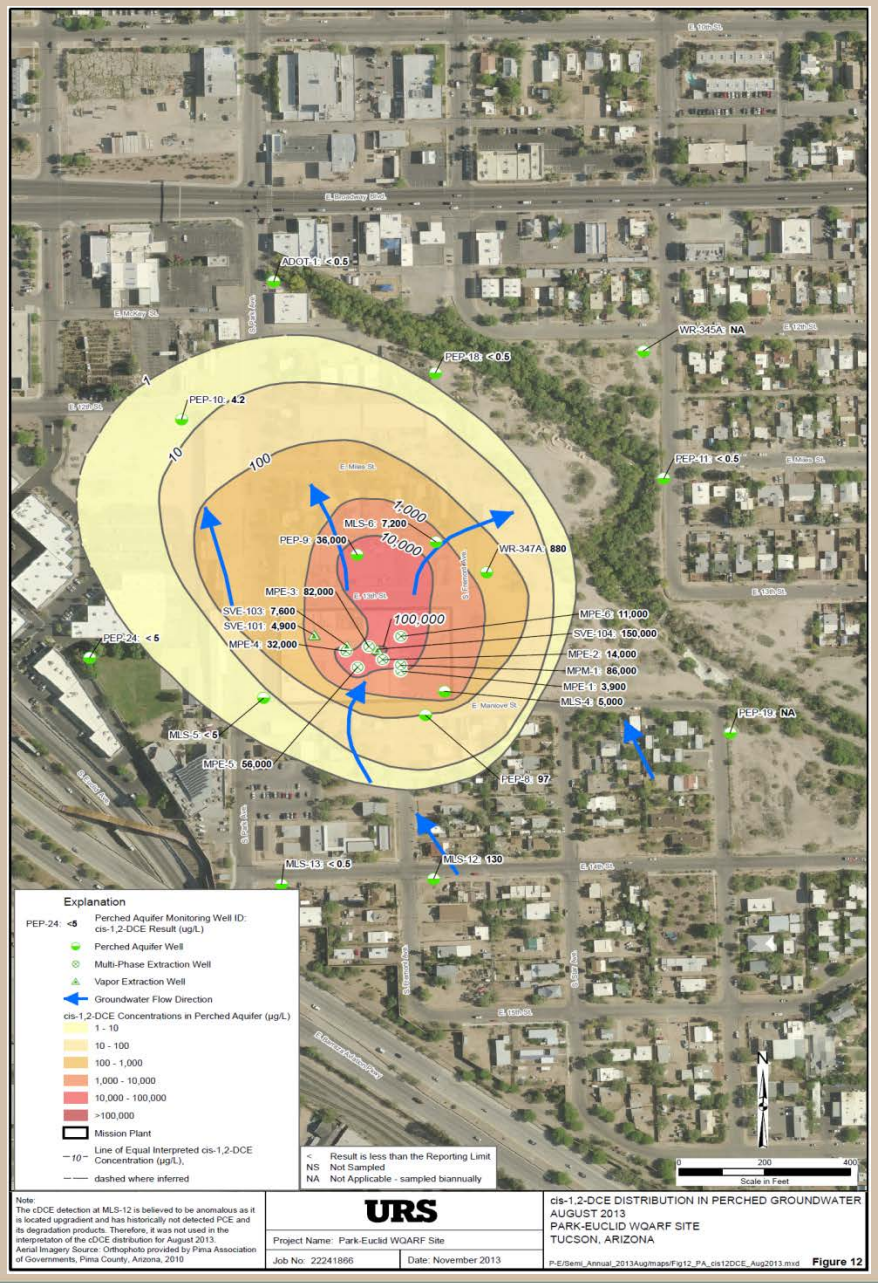
Job No: 22241866 | Date: November 2013

TCE DISTRIBUTION IN PERCHED GROUNDWATER
AUGUST 2013
PARK-EUCLID WQARF SITE
TUCSON, ARIZONA

P-E/Semi_Annual_2013Aug/maps/Fig11_PA_TCE_Aug2013.mxd

Figure 11

ADEQ Arizona Department of Environmental Quality



Note:
The cDCE detection at MLS-12 is believed to be anomalous as it is located upgradient and has historically not detected PCE and its degradation products. Therefore, it was not used in the interpretation of the cDCE distribution for August 2013.
Aerial Imagery Source: Orthophoto provided by Pima Association of Governments, Pima County, Arizona, 2010

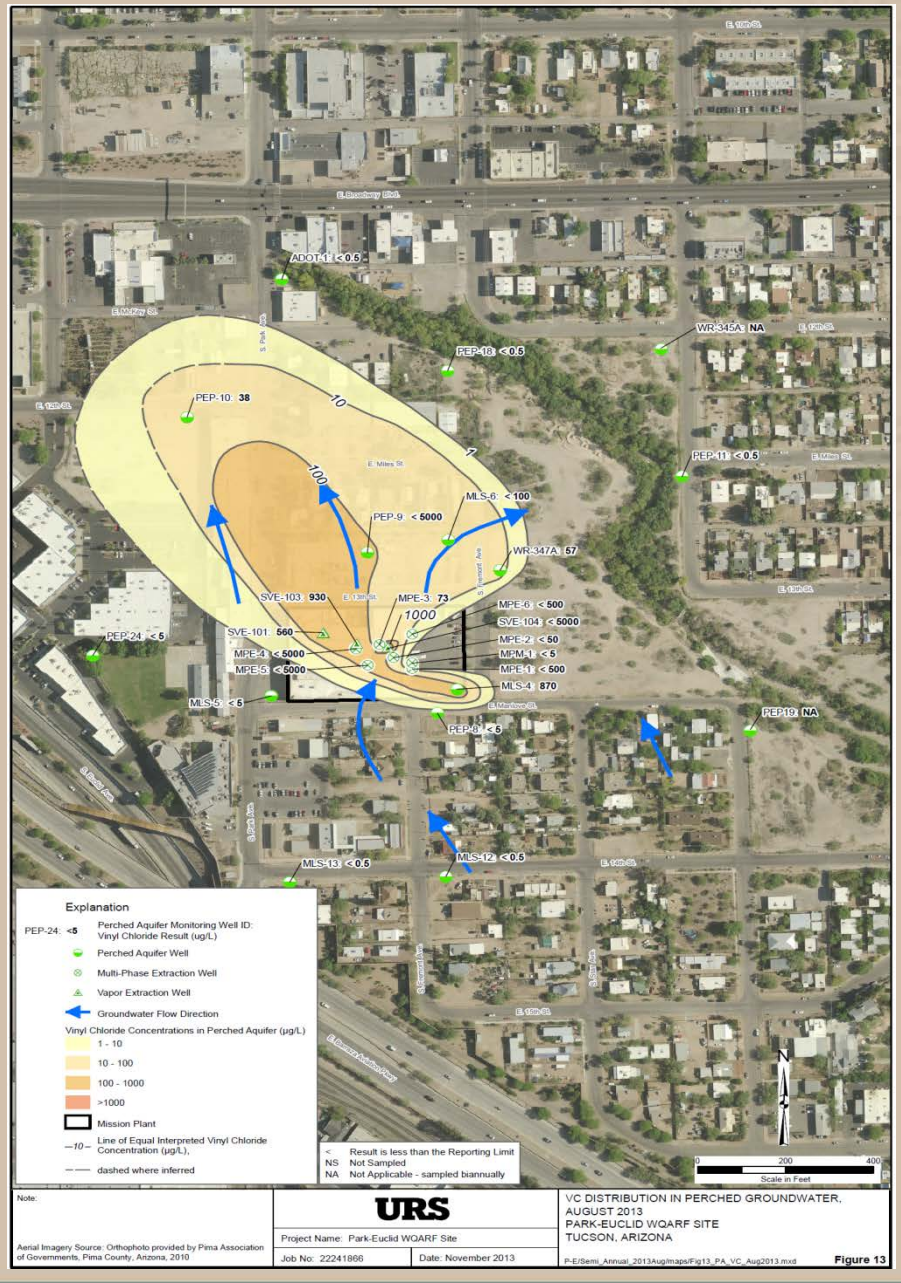
URS

Project Name: Park-Euclid WQARF Site
Job No: 22241866
Date: November 2013

cis-1,2-DCE DISTRIBUTION IN PERCHED GROUNDWATER
AUGUST 2013
PARK-EUCLID WQARF SITE
TUCSON, ARIZONA

P-E/Semi_Annual_2013Aug/maps/Fig12_PA_cis12DCE_Aug2013.mxd

Figure 12



Note:

Aerial Imagery Source: Orthophoto provided by Pima Association of Governments, Pima County, Arizona, 2010

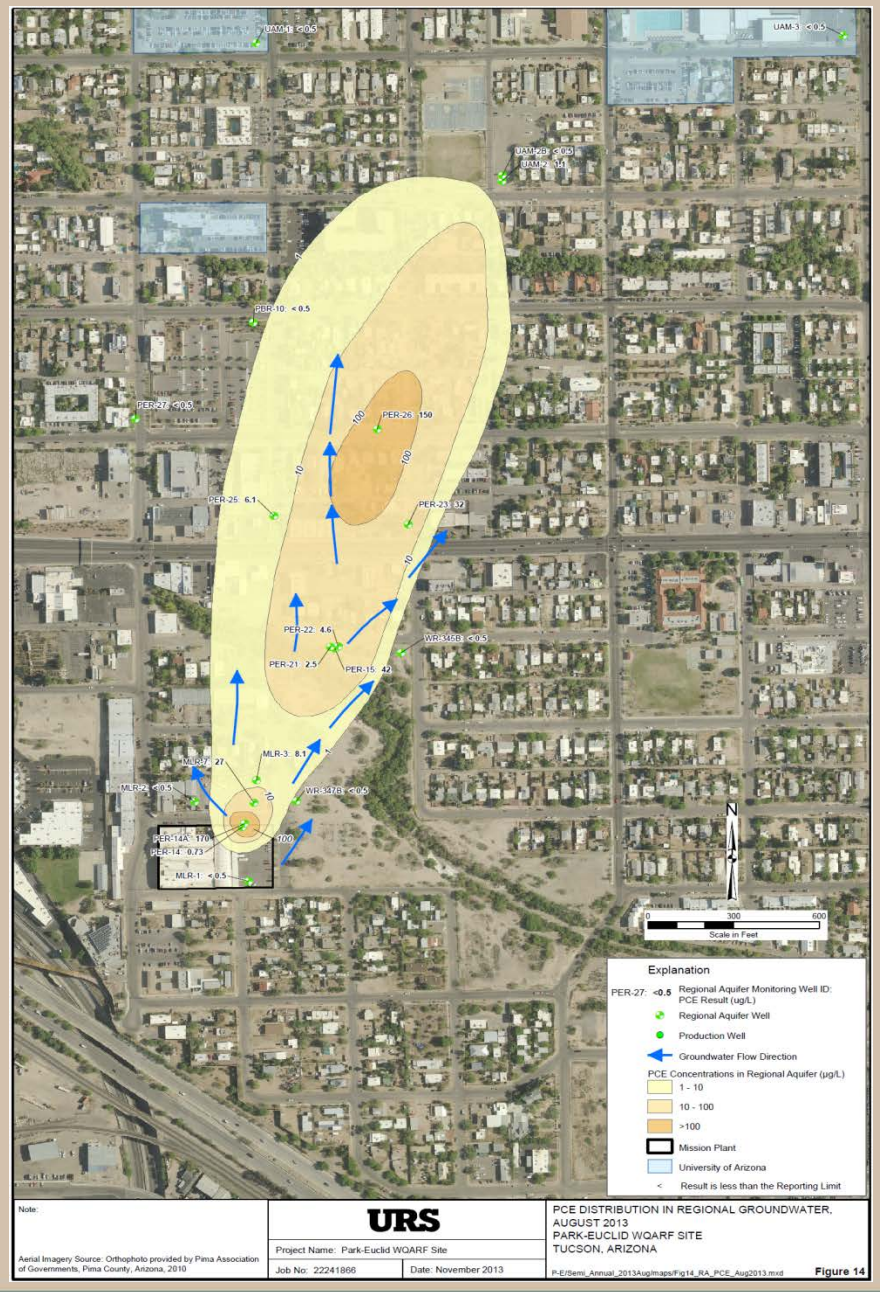
URS

Project Name: Park-Euclid WQARF Site
Job No: 22241866
Date: November 2013

VC DISTRIBUTION IN PERCHED GROUNDWATER,
AUGUST 2013
PARK-EUCLID WQARF SITE
TUCSON, ARIZONA

P-E/Semi_Annual_2013Aug/maps/Fig13_PA_VC_Aug2013.mxd

Figure 13



Note:

Aerial Imagery Source: Orthophoto provided by Pima Association of Governments, Pima County, Arizona, 2010

URS

Project Name: Park-Euclid WQARF Site

Job No: 22241866 | Date: November 2013

PCE DISTRIBUTION IN REGIONAL GROUNDWATER, AUGUST 2013
PARK-EUCLID WQARF SITE
TUCSON, ARIZONA

P-E/Semi_Annual_2013Aug/maps/Fig14_RA_PCE_Aug2013.mxd

Figure 14

Note:

Aerial Imagery Source: Orthophoto provided by Pima Association of Governments, Pima County, Arizona, 2010

URS

Project Name: Park-Euclid WQARF Site

Job No: 22241866 | Date: October 2013

TCE DISTRIBUTION IN REGIONAL GROUNDWATER
AUGUST 2013
PARK-EUCLID WQARF SITE
TUCSON, ARIZONA

P-E/Semi_Annual_2013Aug/maps/Fig15_RA_TCE_Aug2013.mxd

Figure 15

Elements of the Feasibility Study

- MPE currently being conducted to remove contaminant mass in the UVZ;
- Two additional Regional Aquifer monitoring wells to be installed;
- Four additional off-site vapor monitoring wells to be installed in the UVZ;
- Groundwater model to be updated;
- LVZ SVE pilot test shows SVE is viable option for addressing source zone in the Regional Aquifer;
- Additional vapor intrusion assessment will be conducted;
- Continued Groundwater Monitoring;
- Bench Scale Bioaugmentation testing is currently being evaluated for Field Scale testing viability.

7th & Arizona WQARF Site

Proposed Remedial Action Plan Summary

Scott R. Green, Project Manager

Southern Regional Office

ADEQ Arizona Department of Environmental Quality

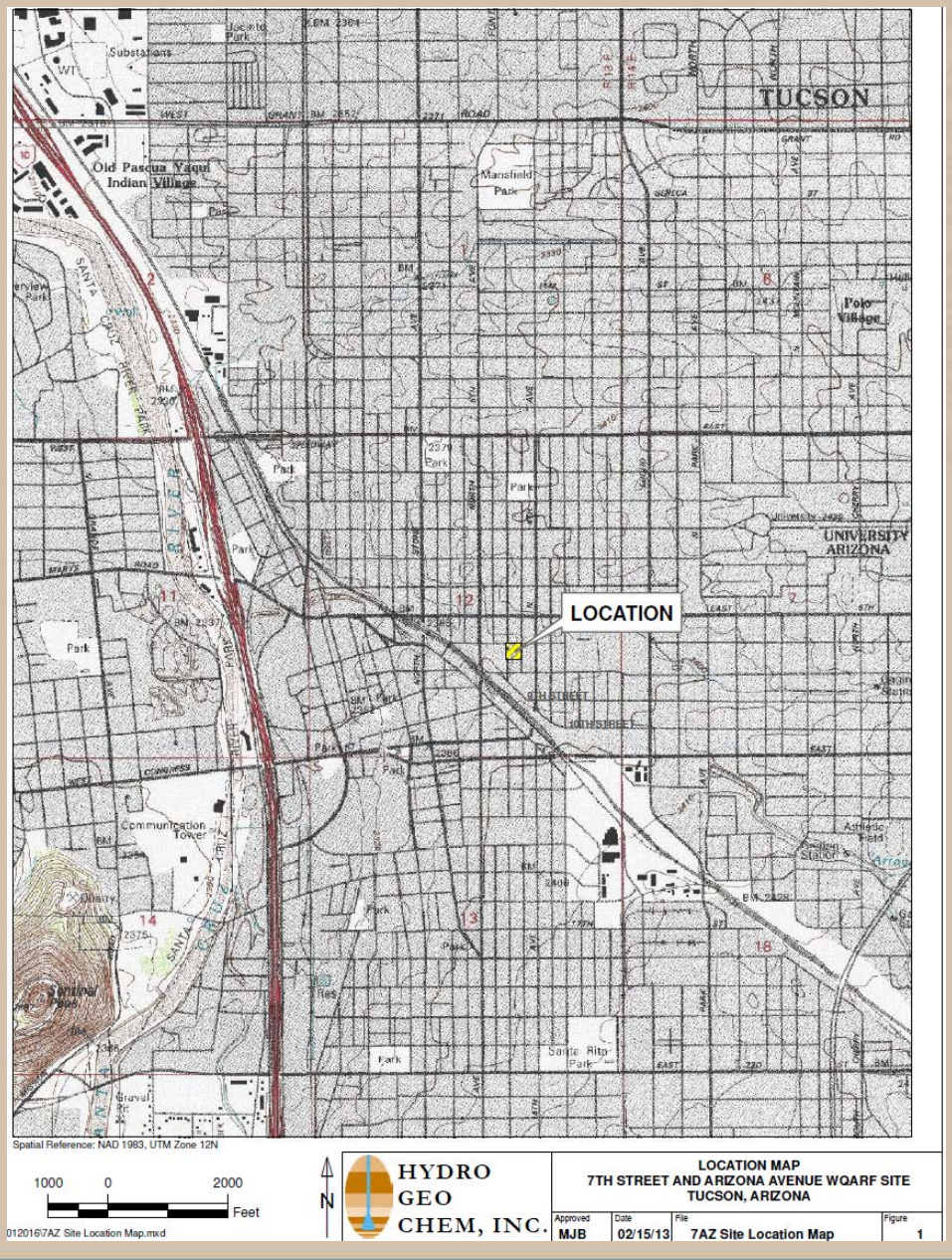
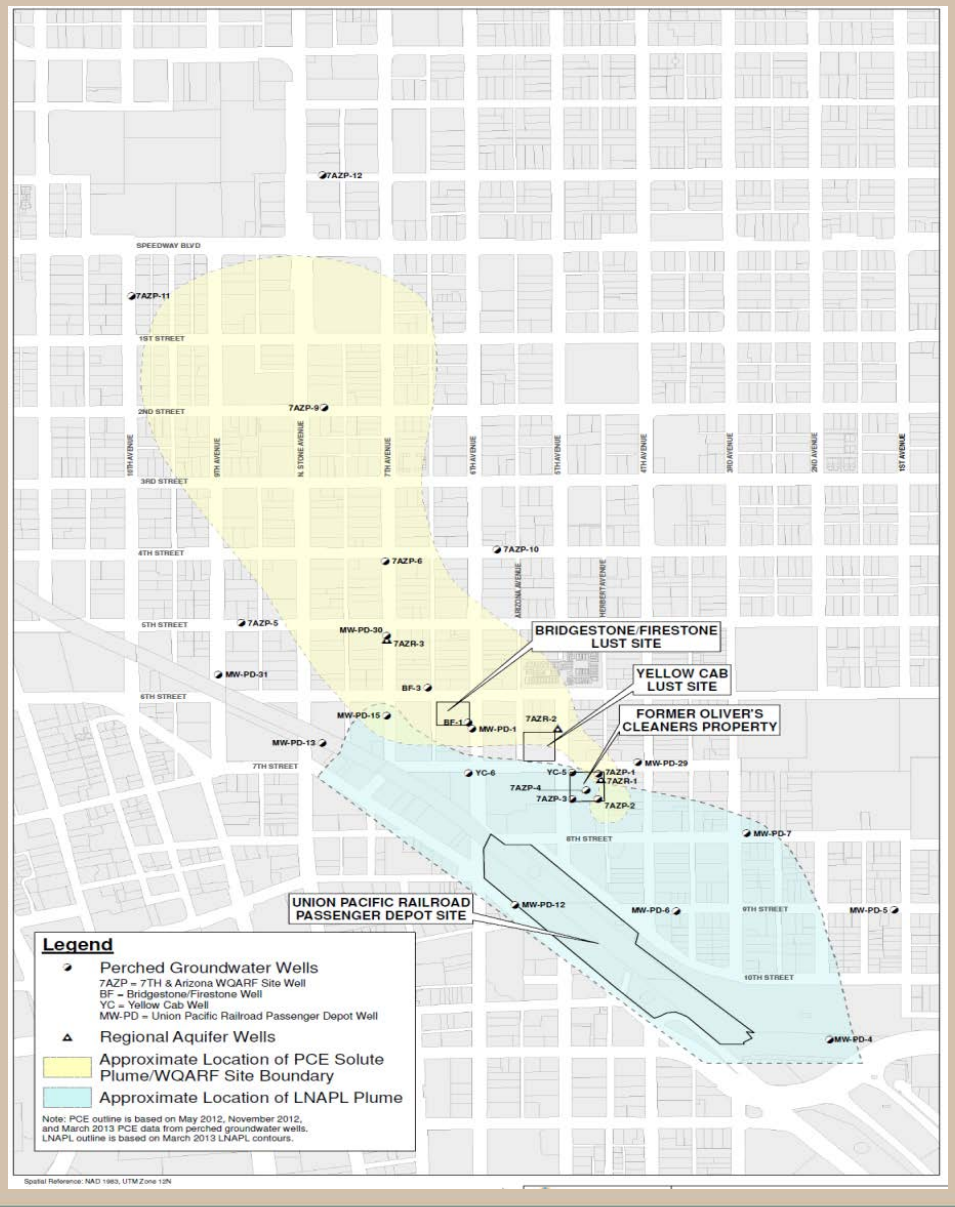
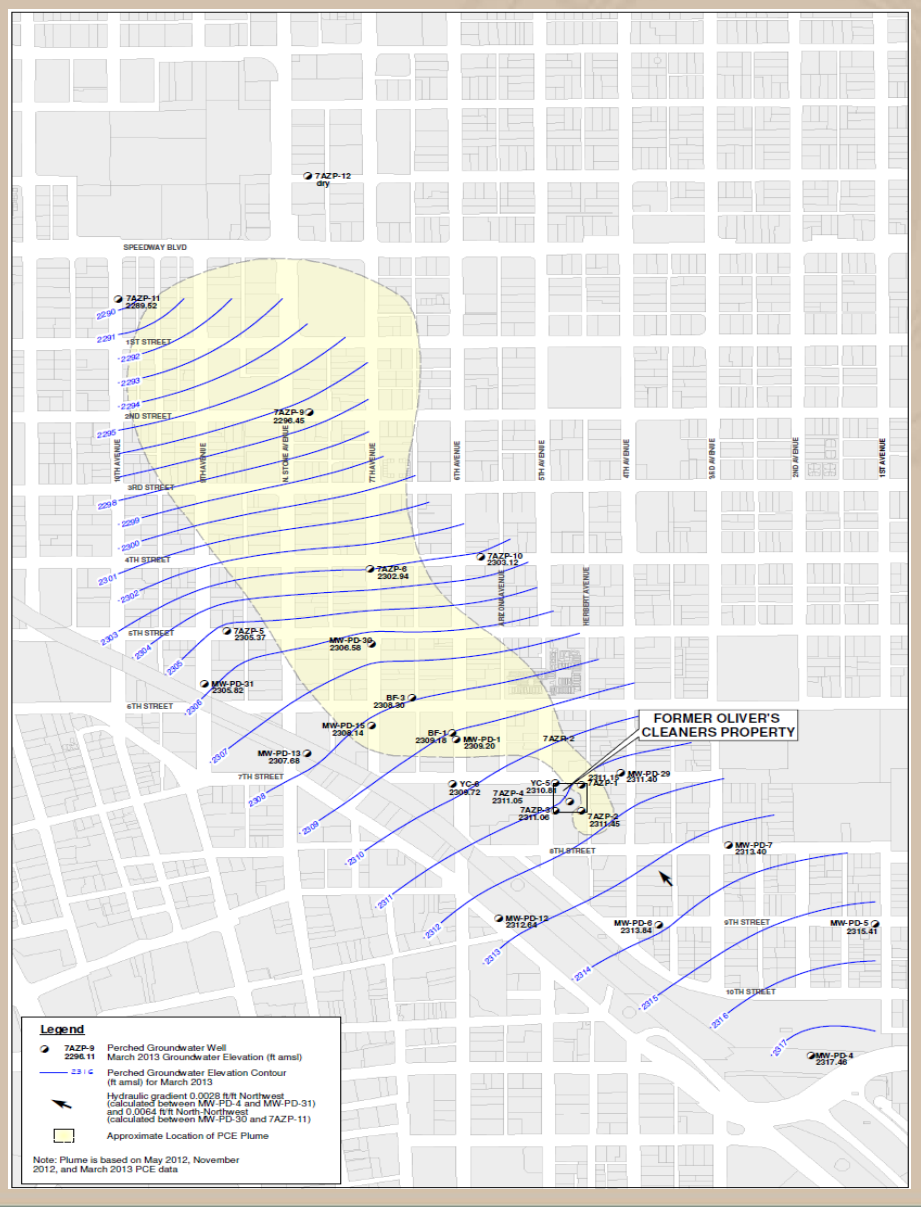

TUCSON
LOCATION
Old Pascua Yaqui Indian Village
Mansfield Park
Poe Village
UNIVERSITY ARIZONA
Communication Tower
Santa Rita Park
Spatial Reference: NAD 1983, UTM Zone 12N
1000 0 2000
Feet
N
HYDRO GEO CHEM, INC.
LOCATION MAP
7TH STREET AND ARIZONA AVENUE WQARF SITE
TUCSON, ARIZONA
Approved MJB
Date 02/15/13
File 7AZ Site Location Map
Figure 1
01201607AZ Site Location Map.mxd

TABLE 1
Chronology of Site Activities
7th Street and Arizona Avenue WQARF Site, Tucson, Arizona

Year	Site Activities
1928 - 1956	Dry cleaning may have been performed on the property, but cannot be verified.
1957 - 1989	Oliver's Cleaners owns the property and continuously operates a dry cleaning business.
1989	Oliver's Cleaners buildings are destroyed by fire.
1991	Seven underground storage tanks (1 - 10,000 gallon solvent, 4 - 1,000 gallon solvent, 2 - 500 gallon heating/oil tanks) are removed from the property.
1992	Soil samples are collected in the vicinity of the heating/waste oil tanks for TPH analysis. An analysis of a groundwater sample from the on-site water supply well detects PCE and TCE at concentrations below AWQS. (Zenitch)
1996	The water supply well on the property is abandoned.
1997	26 soil and soil gas samples are collected as part of a PA/SI investigation. Contamination is found near all solvent tank locations. (ADEQ)
2000	Site is placed on the WQARF Registry with a score of 40 out of 120.
2002	A site investigation is completed to assess whether an Early Response Action is appropriate. Investigation includes: sampling from perched groundwater and regional aquifer wells; LNAPL sampling; implementation of a passive soil gas survey; collection of soil samples during well installation for VOC, petroleum hydrocarbon, TOC and physical property characterization; and soil vapor sampling from nested wells. (Kleinfelder and HGC)
2003	First and second quarter groundwater monitoring/sampling is performed. (Kleinfelder)
2004 - 2008	Soil vapor monitoring and groundwater monitoring activities are performed. (HGC)
2005 - 2006	An SVE well and SVE remedial system are installed under an ERA. An SVE pilot test is conducted to evaluate pneumatic properties. (HGC)
2006 - 2009	SVE is operated continuously as a remedial action to remove VOCs from the source property. Mass removal remedial data and O&M data are collected. (HGC)
2007	An air sparge well and associated vapor wells are installed. An air sparge pilot test is conducted to evaluate the efficacy of removing chlorinated VOCs from the LNAPL. (HGC)
2009	SVE remedial system is shut down after removal of approximately 770 pounds VOCs.
2011 - 2012	Soil vapor samples are collected from nested probes and monitoring wells to establish current Site conditions. (HGC)
2012	Groundwater sampling of all existing monitoring wells is performed to establish current Site conditions. (HGC)
2013	March - RI/FS Work Plan is submitted to and approved by ADEQ. (HGC)
2013	March 29 - ARS §49-287.03 newspaper notification is posted for 30-day public comment for start of RI and FS studies.
2013	March - Perched groundwater wells are sampled for geochemical evaluation. A shallow soil gas survey is performed. (HGC)
2013	April - Baseline Human Health Risk Assessment is drafted, to be included as an appendix to the RI Report. (HGC)
2013	May - Land Use Study report is drafted, to be included as an appendix to the RI Report. (HGC)
2013	May - Remedial Investigation Report is drafted. (HGC)
2013	May 17 - Notice of 30-day public comment period for draft RI Report is posted in local newspaper.
2013	August - Responsiveness summary to address COT comments were drafted. (HGC)
2014	February 4 - Notice of solicitation of Remedial Objectives and February 18 CAB meeting is posted in local newspaper.
2014	February 19 - RO Report is drafted and 30-day public comment period starts (ADEQ)
2014	March 28 - Availability of FS Work Plan is posted in local newspaper.
2014	March 21 - RI Report is finalized. (HGC)





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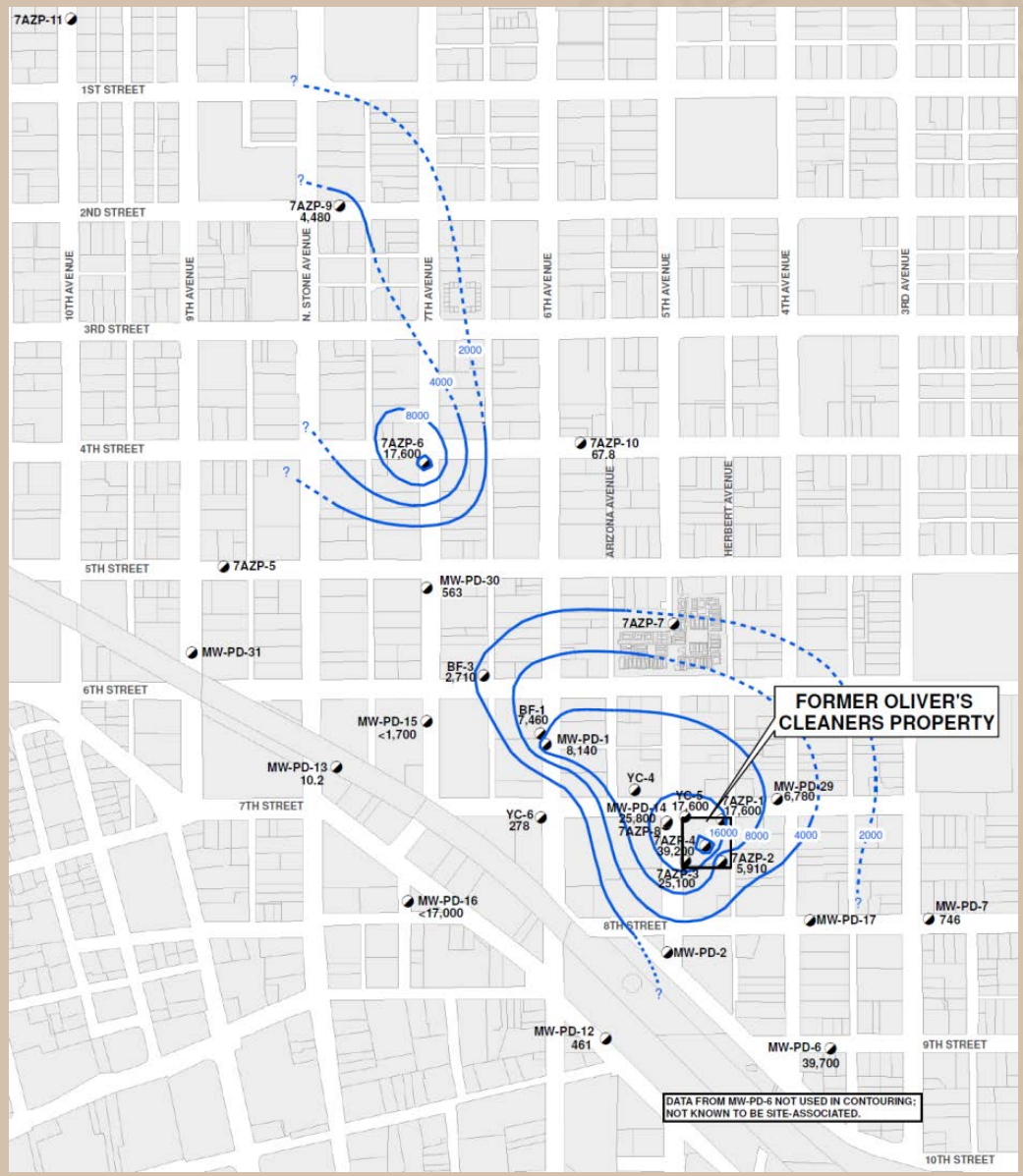


Legend

7AZP-9 4,480	Perched Groundwater Well PCE Soil Vapor Concentration (µg/m^3)
8000	PCE Soil Vapor Contour

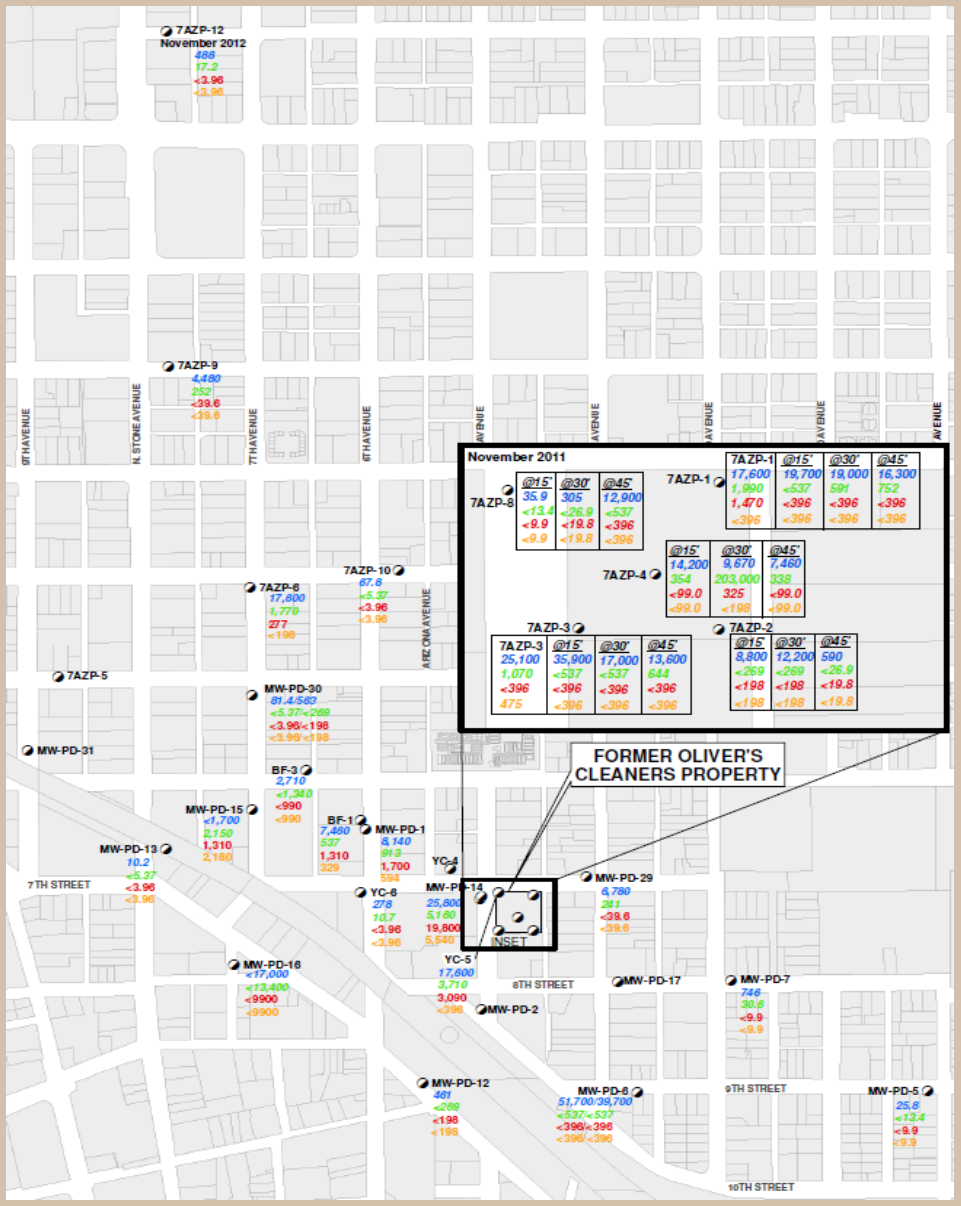
N

HYDRO GEO CHEM, INC.

2011/2012 PCE SOIL VAPOR CONTOURS
7TH STREET AND ARIZONA AVENUE WQARF SITE
TUCSON, ARIZONA

Approved	Date	File	Figure
AJB	03/28/14	K:\2012016\7AZ-PCEcontours2012_FS	9

ADEQ Arizona Department of Environmental Quality



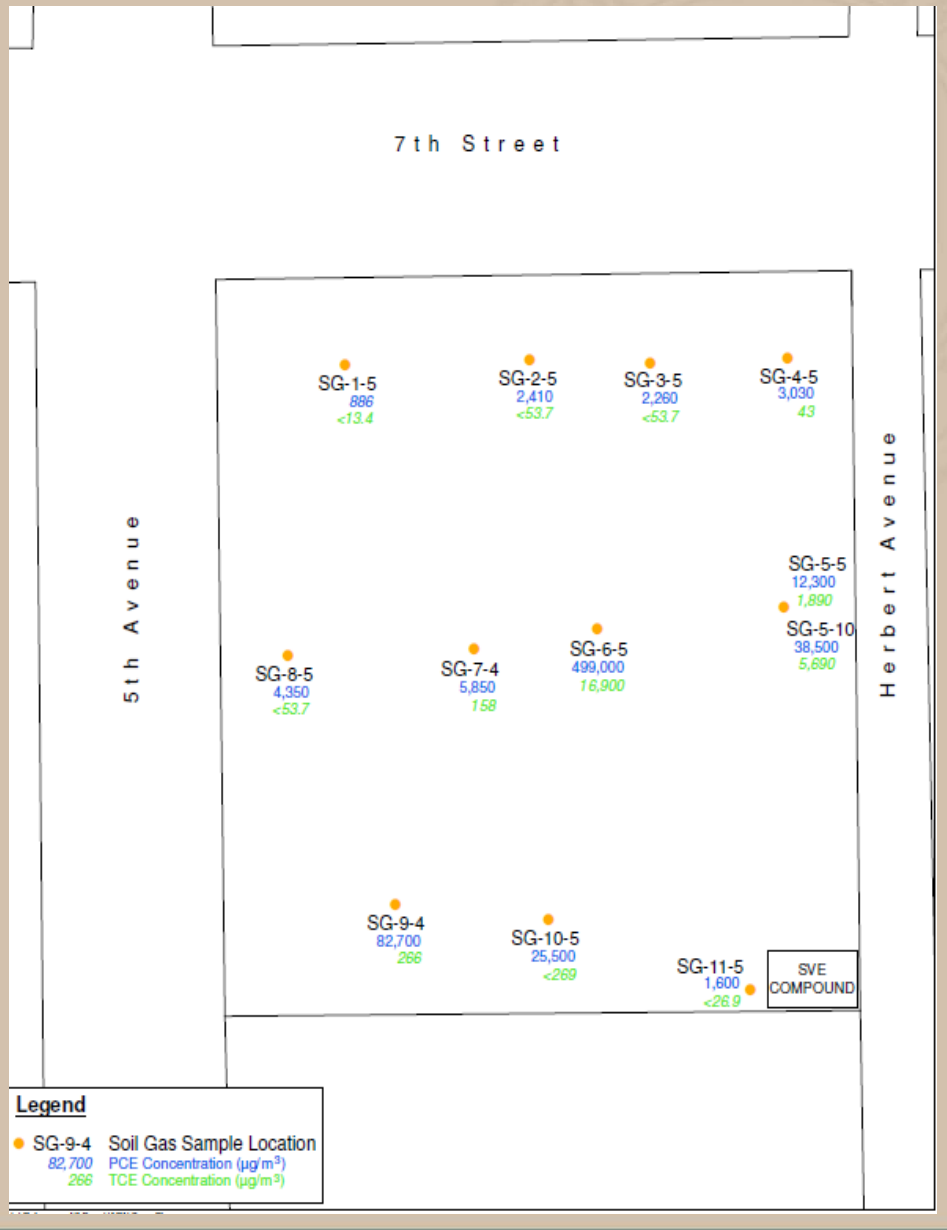


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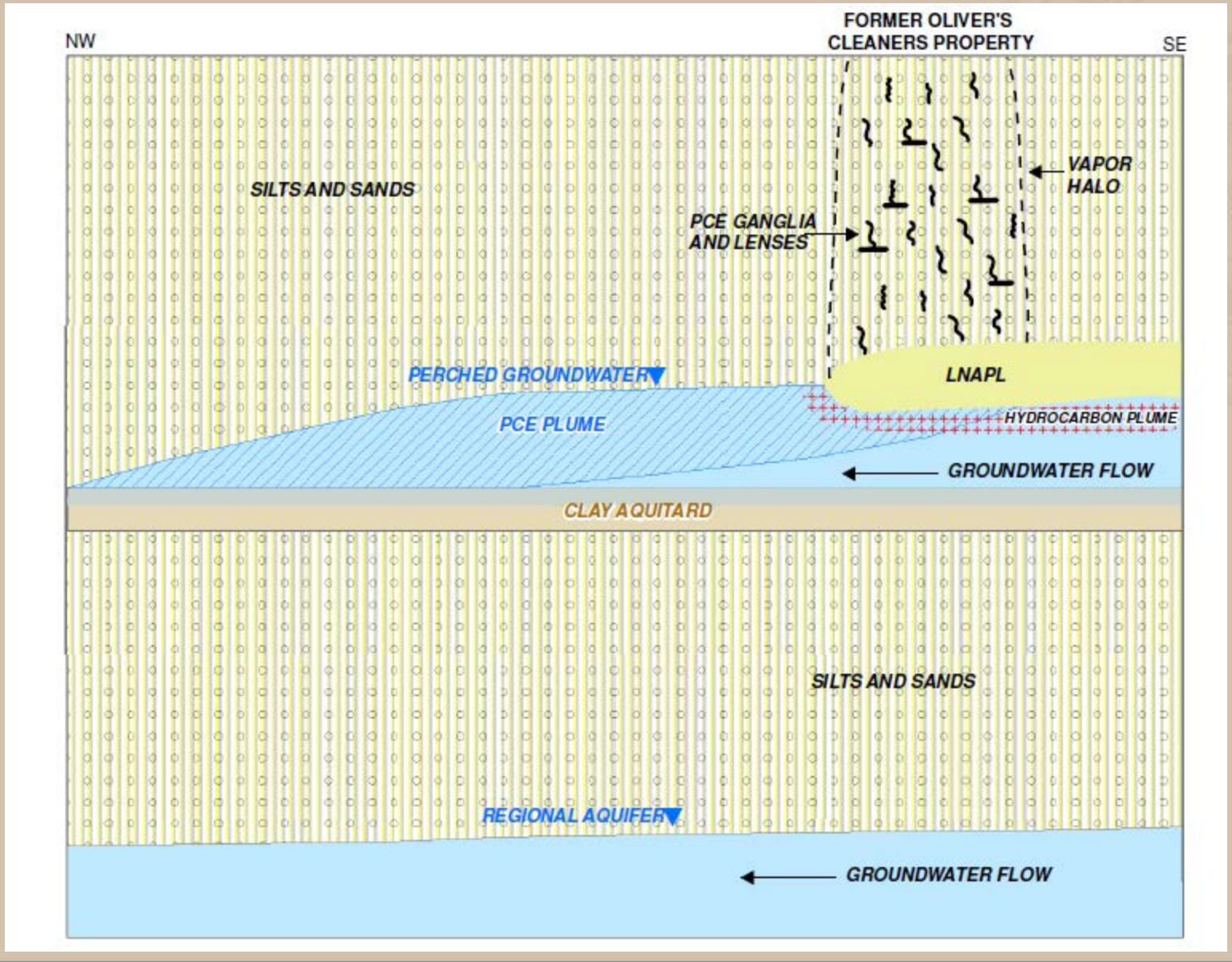
TABLE 2
Highest Observed COC Concentrations in Perched Groundwater, Soil Vapor and Shallow Soil Gas
7th Street and Arizona Avenue WQARF Site, Tucson, Arizona

COC	Perched Groundwater Concentration (µg/L)	Arizona AWQS (µg/L)	Soil Vapor Well Concentration (µg/m^3)	Shallow Soil Gas Concentration (µg/m^3)	Estimated Indoor Air Concentration[a] (µg/m^3)	Ambient Air Screening Level (µg/m^3)	
						Cancer	Non Cancer
PCE	840	5	14,000,000	499,000	14,970	47	180
TCE	300	5	4,360,000	16,900	507	3	8.8
cis-1,2-DCE	1,700	70	874,000	491	14.7	NA	NA
trans-1,2-DCE	510	100	55,300	BRL	NA	NA	260

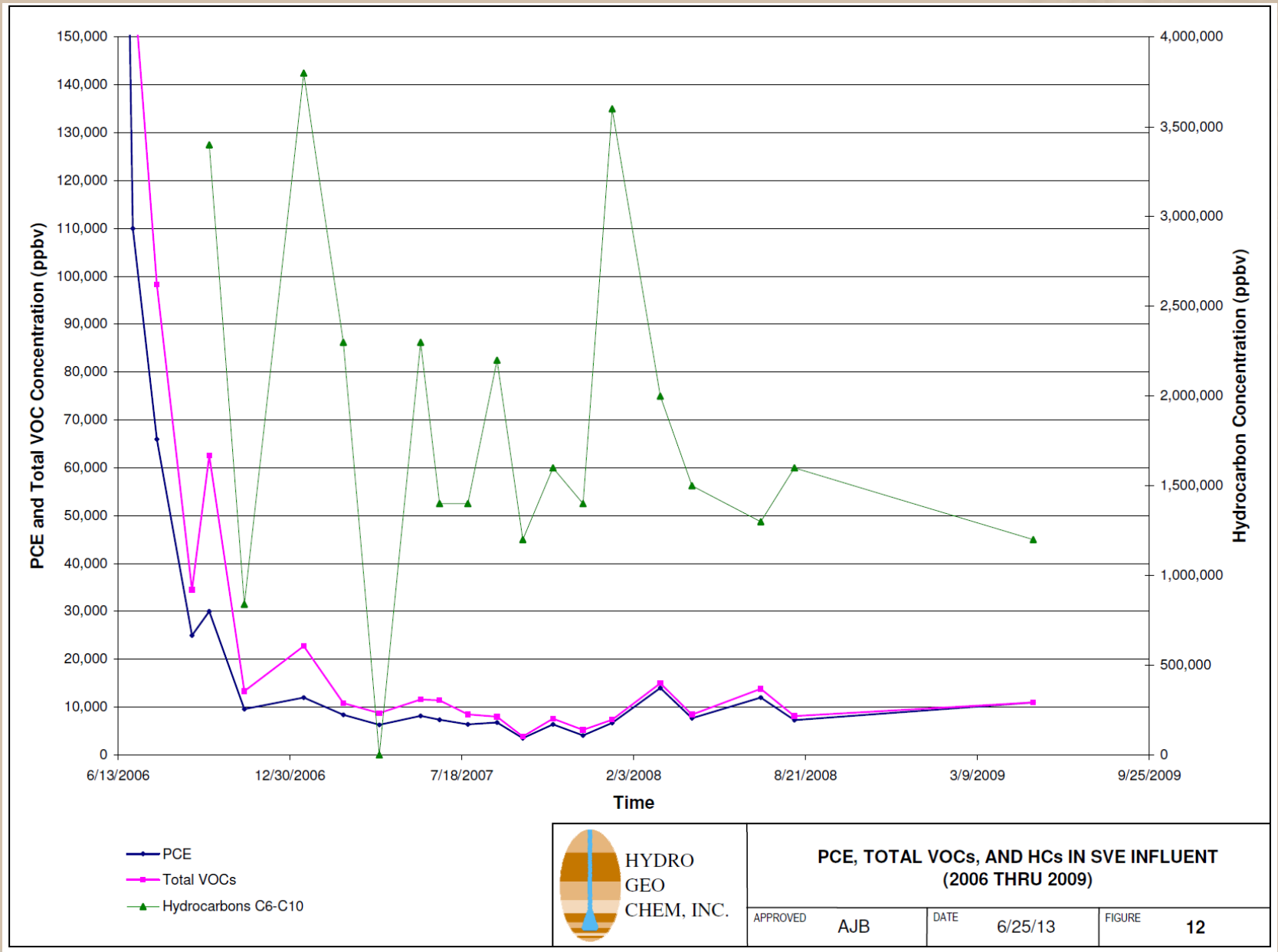
Notes:

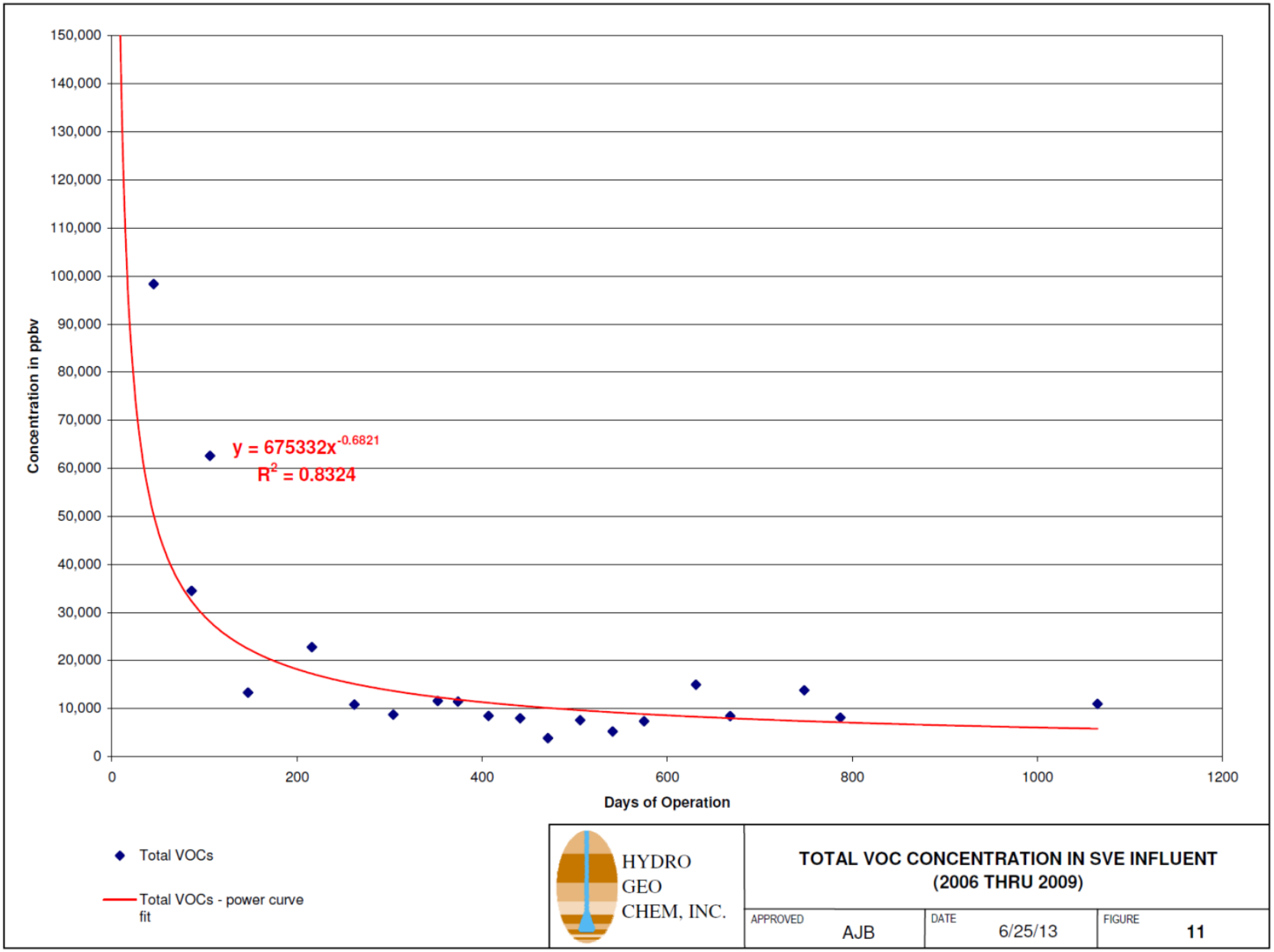
COC = contaminant of concern
PCE = perchloroethene
TCE = trichloroethene
DCE = dichloroethene
µg/L = micrograms per liter
AWQS = aquifer water quality standard
µg/m^3 = micrograms per cubic meter
[a] Based on an EPA attenuation factor of 0.03
Residential Risk = 1E^{-6} for cancer SL; Non cancer SL HQ=1
BRL = below reporting limit
NA = not applicable


NW
FORMER OLIVER'S CLEANERS PROPERTY
SE
SILTS AND SANDS
VAPOR HALO
PCE GANGLIA AND LENSES
PERCHED GROUNDWATER
LNAPL
PCE PLUME
HYDROCARBON PLUME
GROUNDWATER FLOW
CLAY AQUITARD
SILTS AND SANDS
REGIONAL AQUIFER
GROUNDWATER FLOW

Remedial Alternative	Description	COC Removal	Technical Feasibility	Land Use Compatibility[a]	Treatment Effectiveness	Time for COC Removal	Constructability	Operation and Maintenance Considerations	Health and Safety Considerations	Waste Generation and Management	Flexibility	Cost
Soil Vapor Extraction	Removal of highly volatile contaminants from unsaturated soils using vapor extraction wells, after contaminants have partitioned from the aqueous or sorbed phase into the gas phase.	Performs well in high permeability soils when target is highly volatile. Removal efficiency limited by the surface area of groundwater or LNAPL in contact with the vapor phase.	Very easy to implement. Existing infrastructure from the former SVE system can be used with additional wells, piping, and valves.	3	2	1	3	3	3	3	3	3
Air Sparging	Injecting pressurized air through wells into saturated soils to increase partitioning of contaminants into the gas phase for subsequent removal by SVE.	Shown to be effective at removing COCs from LNAPL at this Site during pilot test.	Easy to implement and has been shown to be feasible at this Site. Adequate space exists for the addition of sparge wells with their associated trenches, piping and valves.	3	3	2	3	3	3	3	3	3
Raining Wells	Extraction of LNAPL and groundwater from saturated soils and subsequent introduction into the vadose zone through injection wells or near-surface percolation trenches, with subsequent COC volatilization and capture by SVE.	Spreading COCs throughout the vadose zone should increase the efficiency of SVE at removing chlorinated ethenes by increasing the surface area for volatilization.	Technically challenging. While SVE efficiency of COC removal would be improved, extraction of LNAPL from the subsurface may prove to be very difficult. Significant operation & maintenance issues.	3	2	2	2	1	2	2	3	2
Electrical Resistance Heating	Heating of subsurface materials generated from the passage of an electrical current through soil moisture between electrodes to increase the volatility of COCs from LNAPL and groundwater to facilitate removal in the vapor phase by SVE.	Conceptually capable of removing up to 99% of COC mass from the subsurface over a relatively short time frame (1 - 2 years).	Requires the installation of an electrode network and a voltage control system. Consumes large quantities of electricity. The major limitation on use is availability of an adequate supply of electricity.	2	3	3	2	1	2	2	1	1
Steam Injection	Heating of subsurface materials by injection of pressurized steam into the subsurface to increase the volatility of COCs from LNAPL and groundwater to facilitate removal in the vapor phase by SVE.	Conceptually capable of removing up to 99% of COC mass from the subsurface over a relatively short time frame.	Requires a steam generator and a steam distribution system with wells, and demands large quantities of electricity. Water for steam generation must be treated to prevent scale buildup on the steam generator, distribution system, and wells.	2	3	3	2	1	1	2	2	1
Multiphase Extraction	Groundwater and LNAPL extraction lowers the water table around remediation wells to expose volatile contaminants sorbed onto the previously saturated formation to SVE.	Enhances SVE removal effectiveness by dropping the entire LNAPL layer as dewatering occurs, thereby exposing COCs to partition into the vapor phase. More effective than groundwater extraction for removal of VOCs with low water solubility and high soil carbon affinity.	Technically challenging to screen and pump wells appropriately and dispose of extracted groundwater. Appropriate for sites with saturated soils and moderate permeabilities due to the formation of deeper cones of depression in the water table.	3	2	2	2	2	3	1	2	1
Permanganate Injection	Delivering a strong chemical oxidant solution through wells to a target contaminant in the subsurface in order to transform it into a less harmful species.	Removal effectiveness is not easily quantified and a high oxidant dose would be necessary to effectively impact the LNAPL body.	Difficult to deliver to the appropriate location within the subsurface. Installation of a large number of vertical injection wells or horizontal wells would be required to effectively distribute permanganate over the LNAPL layer. MnO_2 can accumulate, potentially lowering formation permeability. Metals in the subsurface can be mobilized.	3	2	2	1	2	2	3	2	1
Ozone Sparging	Delivering a strong gas-phase chemical oxidant to a target contaminant in the subsurface in order to transform it into a less harmful species. Injection of a hydrogen peroxide solution would also be necessary for hydroxyl radical generation to target the COCs.	Removal effectiveness is not easily quantified and a high oxidant dose would be necessary to effectively impact the LNAPL body.	Ozone must be generated on site by applying high voltage or ultraviolet radiation to air, dry air, or oxygen, consuming significant energy and creating hazards. Ozone gas injection can form channels of preferential ozone flow in the subsurface, complicating delivery of injected ozone. Hydrogen peroxide must be injected in liquid form for hydroxyl radical formation to target the COCs.	3	2	2	2	1	2	2	2	1

Qualitative ratings: 3 = Highest rating; 2 = middle rating; 1 = lowest rating for the criteria


150,000
140,000
130,000
120,000
110,000
100,000
90,000
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
PCE and Total VOC Concentration (ppbv)
4,000,000
3,500,000
3,000,000
2,500,000
2,000,000
1,500,000
1,000,000
500,000
0
Hydrocarbon Concentration (ppbv)
6/13/2006
12/30/2006
7/18/2007
2/3/2008
8/21/2008
3/9/2009
9/25/2009
Time
PCE
Total VOCs
Hydrocarbons C6-C10
HYDRO
GEO
CHEM, INC.
PCE, TOTAL VOCs, AND HCs IN SVE INFLUENT
(2006 THRU 2009)
APPROVED
AJB
DATE
6/25/13
FIGURE
12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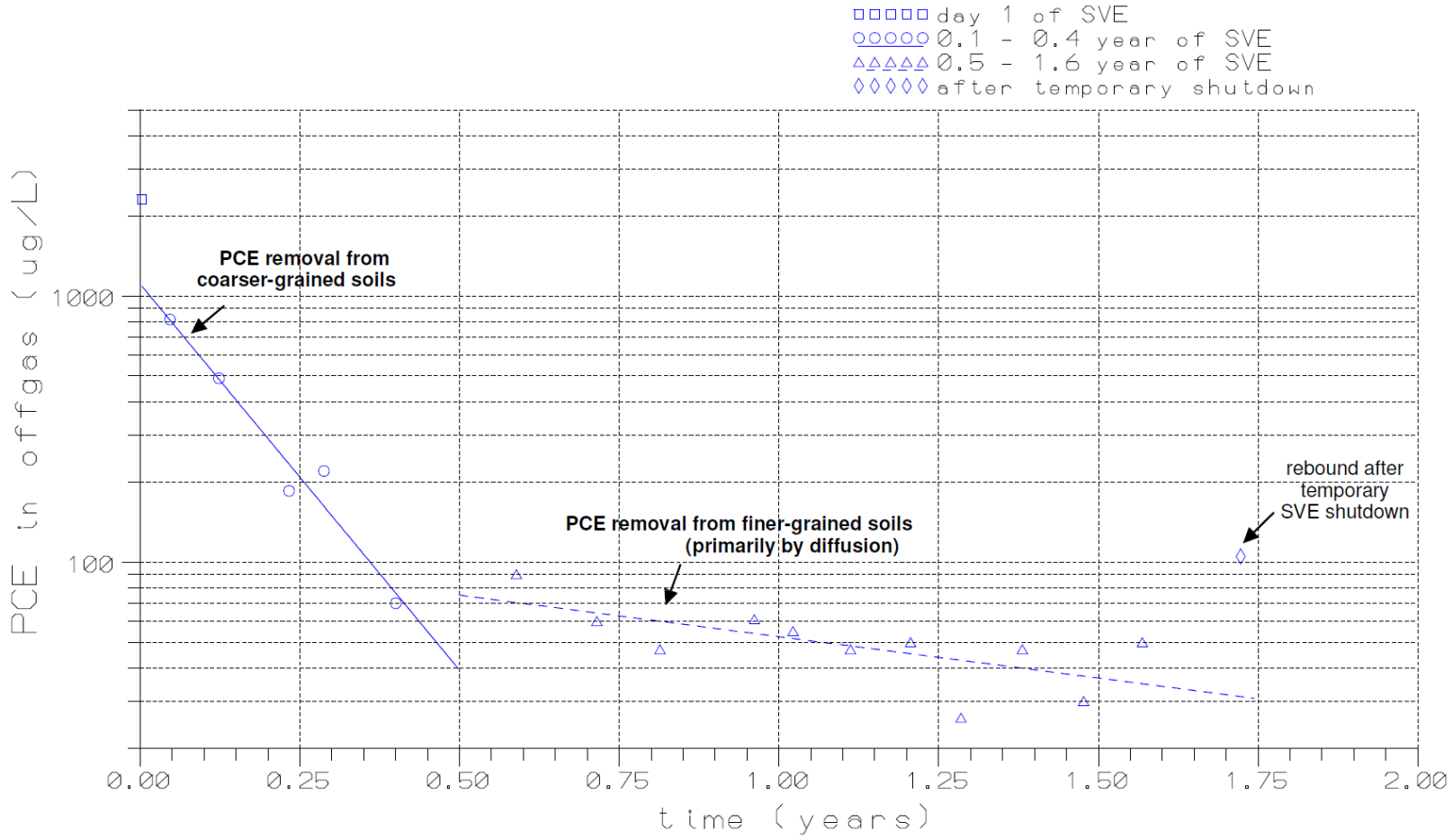
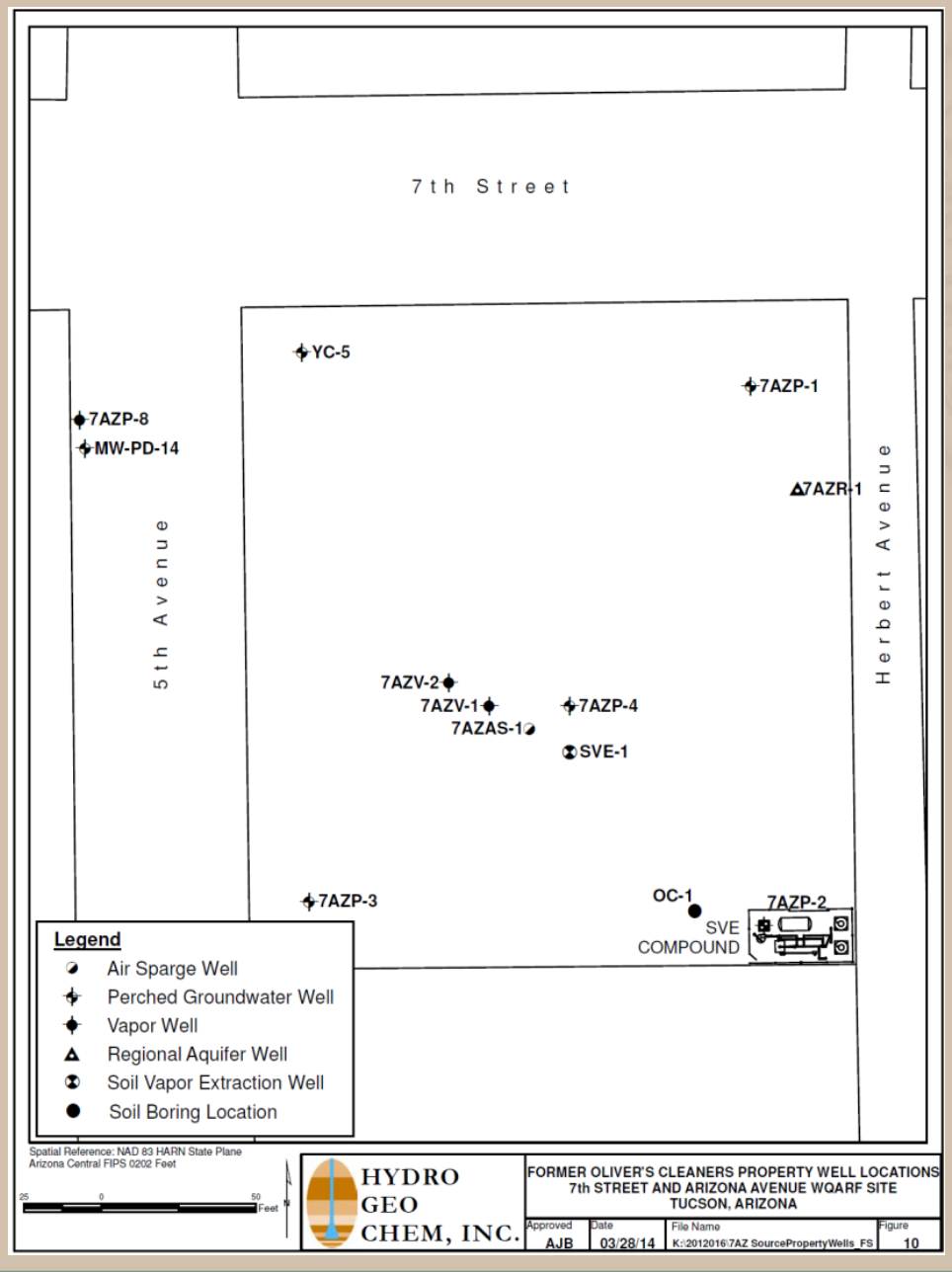
100,000
90,000
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
Concentration in ppbv
y = 675332x-0.6821
R2 = 0.8324
0
200
400
600
800
1000
1200
Days of Operation
Total VOCs
Total VOCs - power curve fit
HYDRO GEO CHEM, INC.
TOTAL VOC CONCENTRATION IN SVE INFLUENT (2006 THRU 2009)
APPROVED
AJB
DATE
6/25/13
FIGURE
11



HYDRO GEO CHEM, INC.

MEASURED PCE CONCENTRATION IN SVE INFLUENT (semi-log plot)

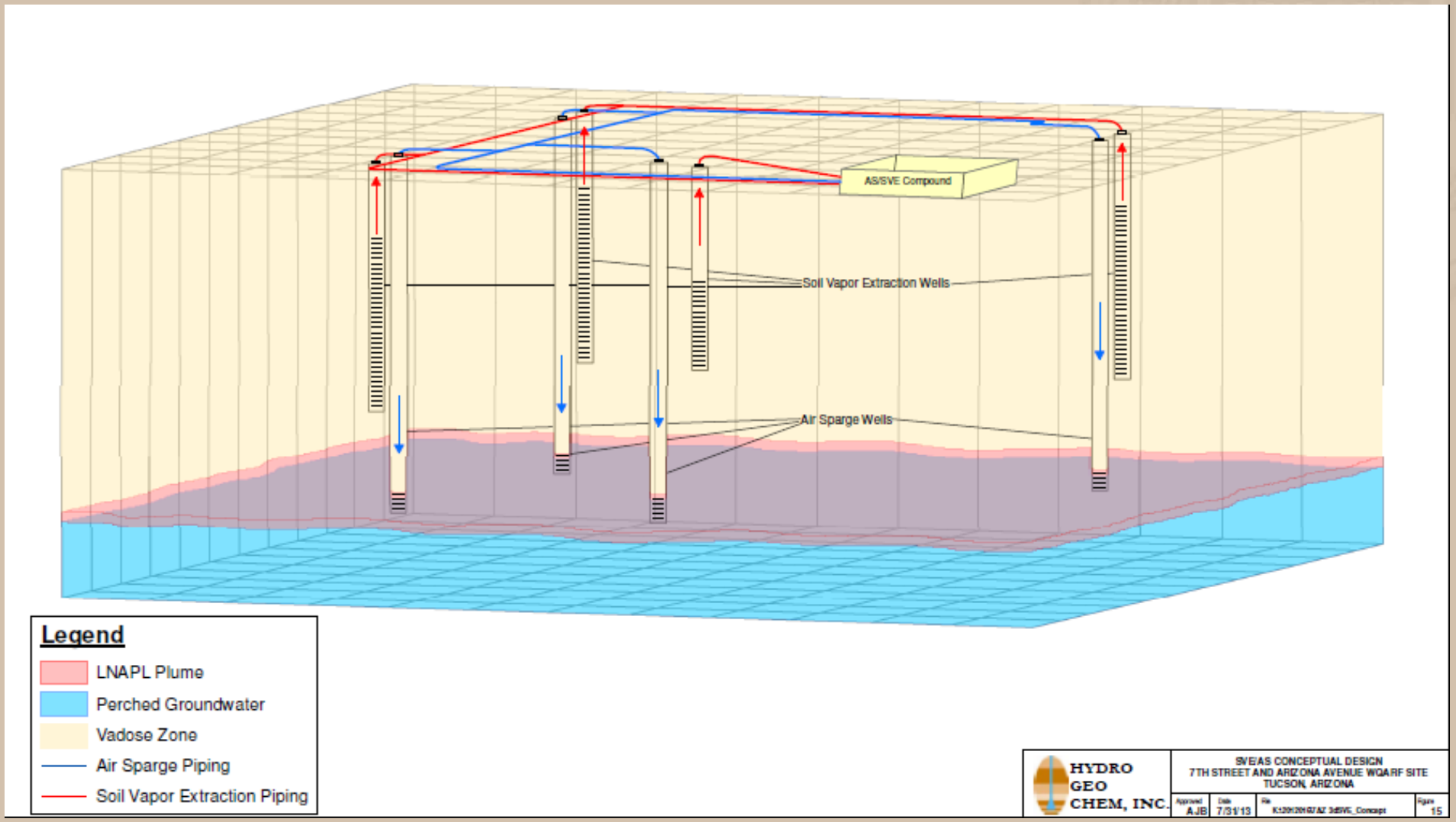
APPROVED	DATE	REFERENCE	FIGURE
SJS	6/20/08	H:/832200/data/ tracrn/runnapl2y/offgasl2.srf	13



ADEQ Arizona Department of Environmental Quality

TABLE 10
LNAPL VOC Concentrations Before and After Sparge Test
7th Street and Arizona Avenue WQARF Site

Compound	Results in milligrams per kilogram	
	Before Sparging	After Sparging
1,2,4-Trimethylbenzene	200	210
1,3,5-Trimethylbenzene	<49	62
4-Isopropyltoluene	<49	49
cis-1,2-Dichloroethene	180	<47
Ethylbenzene	<49	92
m,p-Xylene	<98	330
n-Butylbenzene	110	130
n-Propylbenzene	<49	50
o-Xylene	<49	84
sec-Butylbenzene	<49	52
Tetrachloroethene	290	150
Toluene	<49	300
Trichloroethene	690	130


AS/SVE Compound
Soil Vapor Extraction Wells
Air Sparge Wells
Legend
LNAPL Plume
Perched Groundwater
Vadose Zone
Air Sparge Piping
Soil Vapor Extraction Piping
HYDRO GEO CHEM, INC.
SVE/AS CONCEPTUAL DESIGN
7TH STREET AND ARIZONA AVENUE WQARF SITE
TUCSON, ARIZONA
Approved AJB
Date 7/31/13
Figure 15

Additional Activities as Part of the Proposed Remedial Action Plan

- Soil vapor monitoring will be performed on and off the property until it is demonstrated that COCs decrease and remain at acceptable levels due to SVE/AS system operation;

- Monitoring of perched groundwater will be performed while the SVE/AS system is in operation to demonstrate that contaminant concentrations are decreasing and the plume is not migrating.