Roya C. Kambin
Project Manager
Marketing Business Unit

Chevron Environmental Management Company
6101 Bollinger Canyon Road
San Ramon, CA 94583
Tel (925) 790-6270
RKLG@chevron.com

April 6, 2012

Mr. Jerry Wickham
Alameda County Health Agency
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502

RE: Revised Remedial Design
4191 First Street, Pleasanton, California
Fuel Leak Case No.: RO0000361

Dear Mr. Wickham,

I declare under penalty of perjury that to the best of my knowledge the information and/or recommendations contained in the attached report is/are true and correct.

If you have any questions or need additional information, please contact me at (925) 790-6270.

Sincerely,

Roya Kambin
Union Oil of California – Project Manager

Attachment
Revised Remedial Design

ARCADIS U.S., Inc.
2000 Powell Street
Suite 700
Emeryville
California 94608
Tel 510 652 4500
Fax 510 652 4906
www.arcadis-us.com

ENVIRONMENT

Jerry Wickham, PG, CEH, CHG
Senior Hazardous Materials Specialist
Alameda County Environmental Health Services
1131 Harbor Bay Parkway Suite 250
Alameda, California 94502

Subject:
Revised Remedial Design
Unocal Site 7376
4191 First Street
Pleasanton California
Alameda County Fuel Leak Case No. RO0000361

Date:
April 6, 2012

Contact:
Katherine Brandt

Phone:
510.596.9675

Email:
Katherine.Brandt
@arcadis-us.com

Our ref:
B0047296.0001

Dear Mr. Wickham:

On behalf of Chevron Environmental Management Company, for itself and as Attorney-in-Fact for Union Oil Company of California (hereinafter "EMC"), ARCADIS has prepared this letter to present a revised remedial design for the above referenced site. This letter has been prepared pursuant to the email exchange between Roya Kambin of Chevron and Mr. Jerry Wickham of the Alameda County Environmental Health Services (ACEH) on March 28-29 2012. The purpose of the email exchange was to update ACEH regarding modifications requested from Chevron's remedial system review team (RSRT) during an internal peer review held March 27, 2012.

A Revised Remedial Action Plan (RAP) was submitted to ACEH on October 14, 2011 (ARCADIS 2011[1]) with a response to comments submitted on February 20, 2012 (ARCADIS 2012[2]). The previously submitted documents are included as Attachment 1 and 2.

[1] ARCADIS 2011. Revised Remedial Action Plan for Unocal Site 7376 located at 4191 First Street, Pleasanton, California. October 14.

[2] ARCADIS 2012. Revised Remedial Action Plan Response to Comments for Unocal Site 7376 located at 4191 First Street, Pleasanton, California. February 20.

Modifications to the well layout and system design were recommended by RSRT to ensure complete remediation of the soil and groundwater at the site. The revised well field layout, the location of the compound, and the modified trenching associated with piping to the well locations is presented as Figure 1.

The modifications to the previously submitted revised RAP include the following:

Proposed Remediation Well Construction

1. Air sparge (AS) well construction was originally proposed to be screened from 80-82 feet bgs near offsite well MW-5.

    a. It was determined during RSRT that the vertical depth of the smear zone was not delineated during the installation of MW-5. ARCADIS and Chevron request variability in the screen depths based on field readings collected during proposed AS well installation. The shallowest screen interval is assumed to be approximately 72 to 74 feet bgs based on MW-5 analytical results. The deepest screen interval will be at the base of the smear zone determined during the well installations.

2. Soil Vapor Extraction (SVE) well construction was originally proposed to focus extraction over two zones. The shallow SVE wells (VE-1A, VE-2A, VE-5A) screen intervals were proposed at 20 to 30 feet bgs and the deep SVE wells screen intervals were proposed at 35 to 45 feet bgs(VE-1B, VE-2B, VE-3, VE-4, VE-5B, VE-6, VE-7). In addition to those wells, it was proposed to add the existing CWB-2 well (screened 48 to 60 feet bgs) into the system.

    a. It was determined that instead of two screen intervals, SVE well locations VE-1 through VE-5 require three screen intervals to properly address the vertical extent of the impacted soils. In addition to these locations, an additional area near soil boring EB-1 was identified for soil remediation (VE-8).

    b. The adjusted screen intervals were determined to be 15 to 30 feet bgs (VE-1A, VE-2A, VE-3A, VE-4A, VE-5A, and VE-8A) for the shallow zone, 30 to 45 feet bgs (VE-1B, VE-2B, VE-3B, VE-4B, VE-5B, and VE-8B) for the intermediate zone and 45 to 60 feet bgs

(VE-1C, VE-2C, VE-3C, VE-4C, VE-5C, and VE-8C) for the deep zone. Modifications of these depths may be changed based on field observations during well installations.

c. SVE wells VE-6 and VE-7 will be screened in intermediate zone (30 to 45 feet bgs). This modification increases the screen length by 5 feet. Modifications to the depths may be modified based on field observations.

3. Existing SVE well CWB-2 (screened 48 to 60 feet bgs) was proposed to be connected to the system. In addition to CWB-2, the following existing wells will be connected to the system to ensure the impacts to soil near the underground storage tanks and offsite well MW-5 are addressed. Below are the existing wells that will be connected to the system:

   a. CWA-2 screened 36 to 40 feet bgs

   b. CWA-3 screened 31 to 35 feet bgs

   c. CWB-1 screened 55 to 65 feet bgs, and

   d. CWB-3 screened 31 to 40 feet bgs

Based on the above modifications, the revised well field layout is presented as Figure 1. Modifications to the system components are addressed below:

Radius of Influence

As previously reported in the Revised RAP (ARCADIS 2011), SVE ROIs for shallow wells (20 to 30 feet bgs) ranged from 31 to 54 feet and for deep wells (35 to 45 feet bgs) ROIs ranged from 18 to 27 feet. Conservatively the ROI of 30 feet (shallow) and 20 feet (deep) was used in the previous design. Modifications to the screen intervals will change the ROI as follows:

- Shallow wells will have a 30 foot ROI, no change

- Intermediate wells (formerly listed as deep wells) will have a 27 foot ROI based on the results of pilot test data.

- The deep wells (newly proposed) will have a 27 foot ROI, using the intermediate zone ROI as an estimate, based on the congruency of the zones' soil stratigraphy.

Well Layout

The SVE well field layout was amended resulting in an overall reduction of proposed SVE wells from 29 to 20 (6 shallow SVE wells, 8 intermediate wells and 6 deep wells). The revised well field layout is presented as Figure 1.

The proposed screen intervals were based on an evaluation of the available soil and groundwater analytical data and photo ionization data (PID) presented on boring logs. As stated above additional existing SVE wells CWA-2, CWA-3, CWB-1, and CWB-3 will be incorporated into the SVE system along with CWB-2. The screen interval for the various wells is presented below.

- Shallow
  - Proposed (15 to 30 feet bgs) – 6 shallow wells proposed (VE-1A through VE-5A, and VE-8A)
  - Existing – CWB-3 (31 to 40 feet bgs) and CWA-3 (31 to 35 feet bgs)
- Intermediate
  - Proposed (30 to 45 feet bgs) – 8 intermediate wells proposed (VE-1B through VE-8B)
  - Existing – CWA-2 (36 to 40 feet bgs), CWB-3 (31 to 40 feet bgs)
- Deep
  - Proposed (45 to 60 feet bgs) – 6 deep wells proposed (VE-1B through VE-5B, and VE-8B)
  - Existing – CWA-2 (36 to 40 feet bgs), CWB-1 (55 to 65 feet bgs), CWB-2 (47 to 57 feet bgs)

Equipment Selection, Power Requirements, and Compound Location

The following sections describe the revised abatement equipment and compound location.

Power Requirements

An upgraded electrical service will be required. As indicated previously, 3-phase power is not currently available. After further discussions with Pacific Gas and Electric (PG&E), 3-phase power will be supplied to the site to allow for a change in the equipment used during remediation. If delays are experienced due to PG&E, a mobile unit will be deployed to start the onsite remediation.

Abatement Equipment

The October 2011 Revised RAP (ARCADIS 2011) proposed a 250 standard cubic feet per minute (SCFM) Thermox to abate extracted vapors from 11 SVE wells. As described above, an increase in number of SVE wells from 11 to 20 will require a larger unit. An electric catalytic oxidizer capable of up to 500 SCFM of influent flow and influent hydrocarbon concentrations of up to 3,000 parts per million (PPM) is proposed for the modifications to the well layout.

Compound Location

The location of the compound remains in the same location as the previously submitted Revised RAP (Figure 1).

Phased Approach for Implementation

As stated previously, the duration for obtaining access to install SVE wells (VE-4A/4B/4C) on the offsite property located at 4183 First Street is pending. Therefore, ARCADIS proposes a phased approach for implementation which includes the installation of onsite infrastructure with the subsequent installation of offsite infrastructure as access allows. As stated above, if delays are experienced with power (and/or access to offsite properties) a mobile unit will be deployed to start onsite remediation.

Closing

If you have any questions or comments regarding the contents of this letter please contact either Ms. Roya Kambin of Chevron at 925-790-6270 or by e-mail at RKambin@Chevron.com. Alternatively, you may contact Ms. Katherine Brandt of ARCADIS at 510.596.9675 or by email at Katherine.Brandt@arcadis-us.com.

Sincerely,

ARCADIS U.S., Inc.

Katherine Brandt
Certified Project Manager

Michael Fleischner P.E.
Vice President

Enclosures:

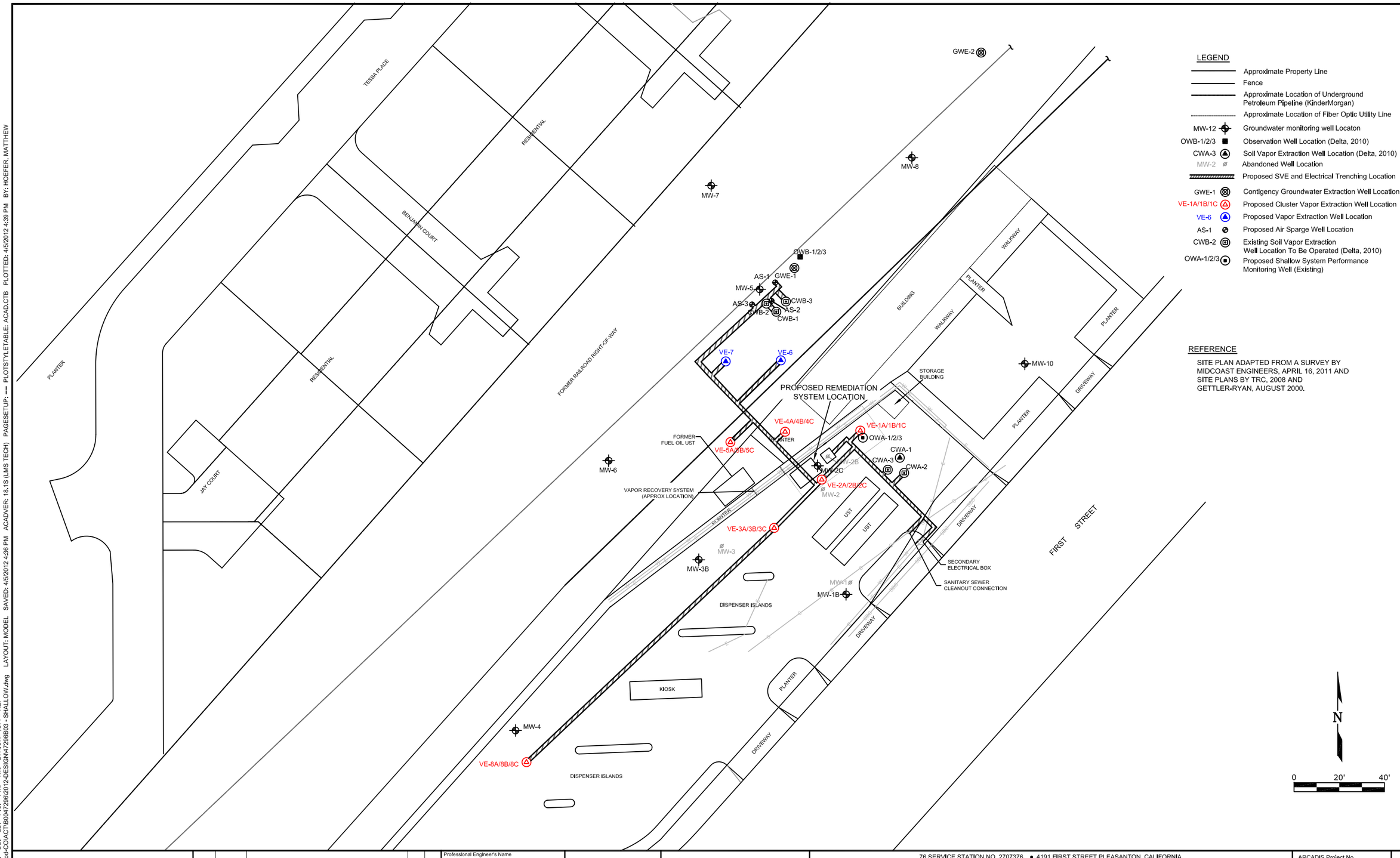
Figure 1	Site Plan with Proposed Well Locations
Attachment 1	Revised Remedial Action Plan October 14, 2011
Attachment 2	Revised Remedial Action Plan Response to Comments February 20, 2012

Copies:

Roya Kambin, Union Oil of California
Danielle Stefani, Livermore Pleasanton Fire Department
Cheryl Dizon (QIC 8021), Zone 7 Water Agency
Les Hausrath, Wendel, Rosen, Black & Dean
Christine Noma, Wendel, Rosen, Black & Dean
Rory MacNeil, Alameda County Public Works
Donna Drogos, Alameda County Environmental Health Services
De L Liu and Na Li
Henry O. Armour
CD & PWS Enterprises, Inc.
Mr. Bill Borgh, ConocoPhillips Company

ARCADIS

Figures



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SCALE(S) AS INDICATED

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MICHAEL P. FLEISCHNER
Professional Engineer's No.: C65705 EXP. 09/30/2013

State	Date Signed	Project Mgr.
CA		KAB
Designed by	Drawn by	Checked by
DDG	MTH	DDG

ARCADIS U.S., INC.

76 SERVICE STATION NO. 2707376 • 4191 FIRST STREET PLEASANTON, CALIFORNIA
CONSTRUCTION DOCUMENTS

SITE MAP WITH PROPOSED WELL AND TRENCH LOCATIONS

CONSTRUCTION

ARCADIS Project No. B0047296.000100003

Date April 5, 2012

ARCADIS
100 MONTGOMERY STREET
SUITE 300
SAN FRANCISCO, CALIFORNIA
94104

FIGURE 1

ARCADIS

Attachment 1

Roya C. Kambin
Project Manager
Marketing Business Unit

Chevron Environmental Management Company
6101 Bollinger Canyon Road
San Ramon, CA 94583
Tel (925) 790-6270
RKLG@chevron.com

October 14, 2011

Mr. Jerry Wickham
Alameda County Health Agency
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502

RE: Revised Remedial Design
4191 First Street, Pleasanton, California
Fuel Leak Case No.: RO0000361

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ENVIRONMENT

Jerry Wickham, PG, CEH, CHG
Senior Hazardous Materials Specialist
Alameda County Environmental Health Services
1131 Harbor Bay Parkway Suite 250
Alameda, California 94502

Subject:
Revised Remedial Design
Unocal Site 7376
4191 First Street
Pleasanton California
Alameda County Fuel Leak Case No. RO0000361

Date:
October 14, 2011

Contact:
Katherine Brandt

Phone:
510.596.9675

Email:
Katherine.Brandt
@arcadis-us.com

Our ref:
B0047296.0001

Dear Mr. Wickham:

ARCADIS, on behalf of Union Oil of California (Chevron), has prepared this letter to present a revised remedial design for the above referenced site. This letter has been prepared pursuant to the telephone conversation between Ms. Katherine Brandt and Mr. David Evans of ARCADIS and Mr. Jerry Wickham of the Alameda County Environmental Health Services (ACEH) on September 28, 2011. The purpose of the phone conversation was to discuss design challenges identified in Antea Group's (Antea) Revised Remedial Action Plan (Revised RAP), dated March 2, 2011. The Revised RAP was approved by the ACEH on March 17, 2011. Specifically, the design challenges discussed include the following:

- Miscalculation of the soil vapor extraction (SVE) radius of influence (ROI) and subsequent challenges with the SVE vapor well layout
- Concerns regarding the purpose of the groundwater extraction and treatment (GWET) system and the incorporation of air sparge (AS)
- Electrical and natural gas limitations
- Access limitations and phased approach for implementation
- GWET as a contingency

Each of the discussion topics as well as revised remedial design is presented below.

Soil Vapor Extraction and Treatment

This section includes a discussion of the technical challenges with the ROI as presented within the Revised RAP as well as an amended ROI and SVE well field layout.

Radius of Influence

Graphical representation of ROI is typically presented on a log normal basis. The ROI as presented in the Revised RAP had both the vacuum and distance in a normal scale which resulted in a ROI of 12 feet. As a result the ROI presented with the Revised RAP underestimates the influence of both the shallow and deep SVE wells.

ARCADIS recalculated the ROI using results from observation wells with screen intervals similar to the SVE well. The ROI was based on a curve fit of observed wellhead vacuums measured at the observation wells versus radial distance from the SVE well. The ROI is defined as the radial distance from the wellhead where 0.1 inches of water column (in. W.C.) would be observed. SVE ROIs for shallow wells ranged from 31 to 54 feet. Conservatively a log average ROI of 30 feet was used for design purposes. SVE ROIs for deep wells ranged from 18 to 27 feet.

Conservatively a log average ROI of 20 feet was used for design purposes. The revised design ROI for the shallower zone (sands/gravels) and deeper zone (finer grained soil) is 30 feet and 20 feet, respectively. Revised graphical ROI determinations for shallow and deep wells are presented with Attachment 1.

The proposed screen intervals were based on an evaluation of the available soil and groundwater analytical data and photo ionization data (PID) presented on boring logs. In addition, existing SVE well CWB-2 will be incorporated into the SVE system. The screen interval for the various wells is presented below.

- Shallow SVE wells screened from 20-30 ft bgs (VE-1A, VE-2A, VE-5A)
- Deep SVE wells screened from 35-45 ft bgs (VE-1B, VE-2B, VE-3, VE-4, VE-5B, VE-6, VE-7)
- Existing SVE well, CWB-2 is screened from 48-60 ft bgs.

Well Layout

Utilizing the revised ROI, the SVE well field layout was amended resulting in a reduction of SVE wells from 29 to 11 (3 shallow SVE wells and 8 deep wells). The revised well field layout including projected ROI is presented as Figure 1.

Groundwater Extraction and Treatment

This section includes a discussion of the technical challenges with the selection of GWET to address separate phase impacts.

Separate Phase Hydrocarbons

As indicated within the Revised RAP, the purpose of the GWET system is to address separate phase hydrocarbons (SPH) at the site. However, SPH has not been observed at the site since 2006. Furthermore, the GWET as designed is unlikely to have any beneficial effects on dissolved phase impacts and may in fact result in the elongation of the dissolved phase plume with the addition of GWE-2.

Air Sparge

Lithology at this site appears conducive to AS. AS has a higher probability of success at addressing dissolved phase impacts in proximity to MW-5. Therefore, ARCADIS is proposing the incorporation of three AS wells into the system. Conservatively, a 10 foot ROI for AS was assumed. The screen interval is proposed to be 80 to 82 feet bgs but will be modified if fine grained sediments are encountered at a shallower depth. The AS well field layout including projected ROI is shown on Figure 1.

Electrical and Natural Gas Limitations

This section includes a discussion of the electrical and natural gas limitations at the site.

Limitations

The Revised RAP did not take into consideration the available electric and gas utilities at the site. Three phase power is not available and currently, less than 200 amps of single phase 240 volt are available. There is not an on-site natural gas

supply available. However, there is a natural gas pipeline located off-site (under 1st Street). ARCADIS has confirmed sufficient natural gas pressure (3 pounds per square inch [PSI]) and British thermal units per hour (BTUH [750,000 BTUH]) can be supplied to the site as supplemental fuel for a thermal catalytic (Thermox) oxidizer.

Equipment Selection, Power Requirements, and Compound Location

The following sections describe the revised abatement equipment and compound location.

Abatement Equipment

The oxidizer proposed within the Revised RAP (500 standard cubic feet per minute [SCFM] Thermox) was based operation of 28 SVE wells. As discussed above only 11 wells are necessary and proposed to address impacts to soil. Therefore, a 250 SCFM Thermox is proposed to abate extracted vapors. A comparably sized positive displacement (PD) or rotary claw blower will be utilized to extract vapor.

Power Requirements

An upgraded electrical service will be required. As indicated above, 3 phase power is not available. To satisfy the power requirements, the service will need to be upgraded to 400 amps of single phase 240 volt to satisfy equipment requirements.

Compound Location

After reviewing site maps and performing a site reconnaissance, ARCADIS has determined the system compound will need to be relocated. The location proposed in the Revised RAP would block a driveway and is in the area containing air and water for customers. Final compound location is pending further review.

Access Limitations and Phased Approach for Implementation

The following sections describe our access limitations to onsite and offsite properties.

Access Limitations

Onsite

Access to the 76 station was established in 2010 and is unrestricted.

Offsite

4183 First Street (Parcel 094-0110-047-03)

- Access is limited to monitoring and sampling and SVE conveyance piping.

An amended access agreement will be necessary for additional intrusive work (i.e. well installation).

Public right-of-way (Parcel 094-0100-048-00 and 094-0110-046-00)

- Access is limited to monitoring and sampling (MW-5 through MW-9)
- 5 borings (3 vapor extraction wells, 1 observation well, and 1 groundwater monitoring well)
- Installation of a remediation system as approved by ACEH.

An amended access agreement will be necessary for all work proposed within the Revised Remedial Design.

Phased Approach for Implementation

The duration for obtaining access to offsite properties is unknown. Therefore, ARCADIS proposes a phased approach for implementation which includes the installation of onsite infrastructure with the subsequent installation of offsite infrastructure as access allows.

GWET as a Contingency

As indicated above, the purpose of the GWET is unclear. Therefore, ARCADIS will include GWET as a contingency if SPH is observed. Infrastructure associated with the GWET system, with the exception of GWE-2, will be added to the overall system

design. In addition, ARCADIS will apply for a discharge permit with the Dublin San Ramon Service District.

If you have any questions or comments regarding the contents of this letter please contact Ms. Katherine Brandt of ARCADIS at 510.596.9675 or by email at Katherine.Brandt@arcadis-us.com.

Sincerely,

ARCADIS U.S., Inc.

Katherine Brandt
Certified Project Manager

David W. Lay, PG
Vice President

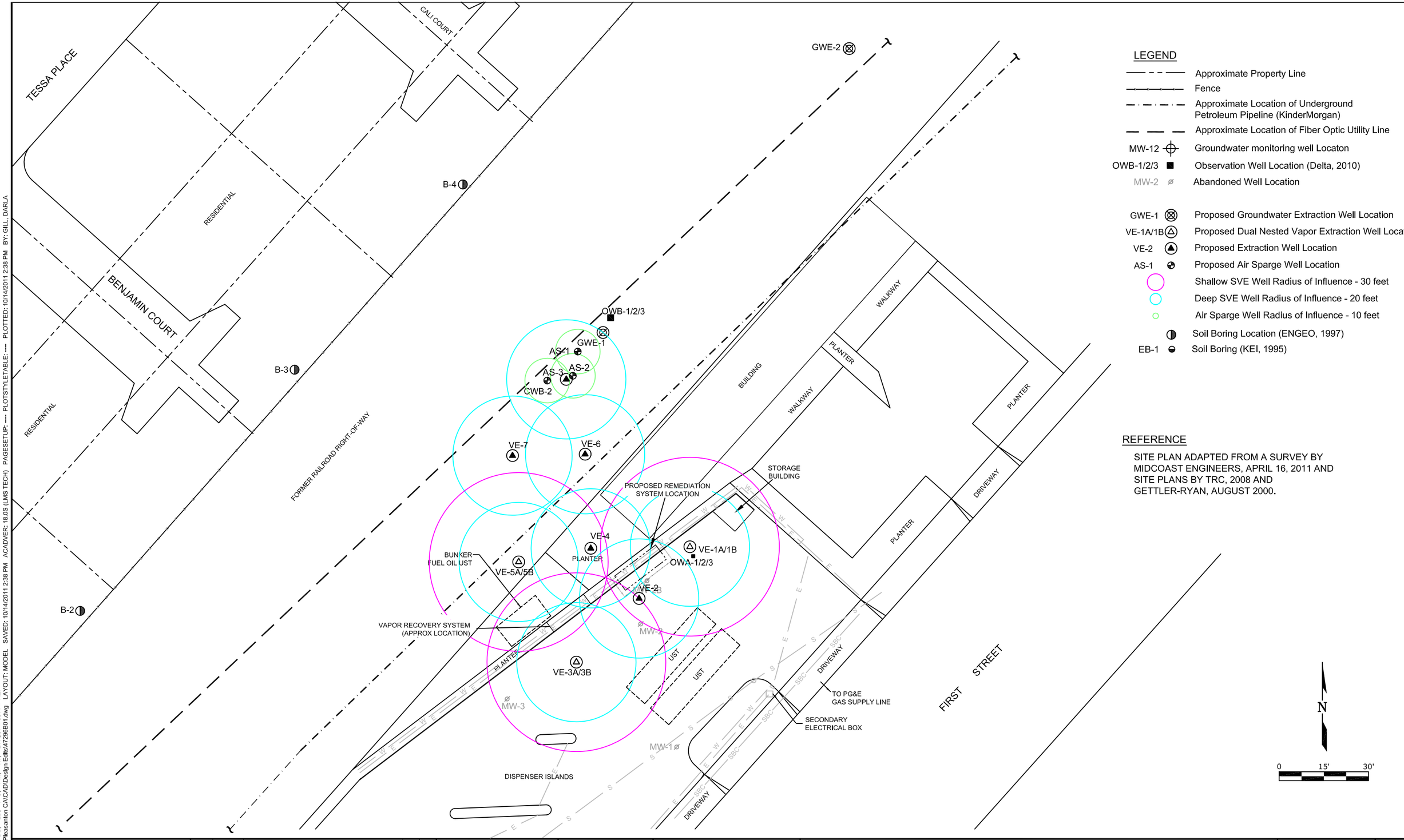
PROFESSIONAL GEOLOGIST
DAVID LAY
No.8545
STATE OF CALIFORNIA

Enclosures:

Figure 1	Site Plan with SVE Well Layout
Attachment 1	Graphical ROI Determination

Copies:

Roya Kambin, Union Oil of California
Danielle Stefani, Livermore Pleasanton Fire Department
Cheryl Dizon (QIC 8021), Zone 7 Water Agency
Les Hausrath, Wendel, Rosen, Black & Dean
Christine Noma, Wendel, Rosen, Black & Dean
Rory MacNeil, Alameda County Public Works
Donna Drogos, Alameda County Environmental Health Services
De L Liu and Na Li
Henry O. Armour
CD & PWS Enterprises, Inc.
Mr. Bill Borgh, ConocoPhillips Company



LEGEND

- Approximate Property Line
- Fence
- Approximate Location of Underground Petroleum Pipeline (KinderMorgan)
- Approximate Location of Fiber Optic Utility Line
- MW-12 — Groundwater monitoring well Locaton
- OWB-1/2/3 — Observation Well Location (Delta, 2010)
- MW-2 — Abandoned Well Location
- GWE-1 — Proposed Groundwater Extraction Well Location
- VE-1A/1B — Proposed Dual Nested Vapor Extraction Well Location
- VE-2 — Proposed Extraction Well Location
- AS-1 — Proposed Air Sparge Well Location
- Shallow SVE Well Radius of Influence - 30 feet
- Deep SVE Well Radius of Influence - 20 feet
- Air Sparge Well Radius of Influence - 10 feet
- Soil Boring Location (ENGEO, 1997)
- EB-1 — Soil Boring (KEI, 1995)

REFERENCE

SITE PLAN ADAPTED FROM A SURVEY BY MIDCOAST ENGINEERS, APRIL 16, 2011 AND SITE PLANS BY TRC, 2008 AND GETTLER-RYAN, AUGUST 2000.

CITY: DIV/GROUP: DB: LD: PIC: PM: TM: LYR:ON=*;OFF=*REF* G:\AProject\Chevron - Pleasanton CA\CAD\Design Edits\472965\01.dwg LAYOUT: MODEL SAVED: 10/14/2011 2:38 PM ACADVER: 18.0S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ---- PLOTTED: 10/14/2011 2:38 PM BY: GILL, DARLA

SCALE(S) AS INDICATED

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name
MICHAEL P. FLEISCHNER
Professional Engineer's No.
C65705 EXP. 09/30/2013
State CA | Date Signed | Project Mgr. KAB
Designed by DDG | Drawn by MTH | Checked by DDG

ARCADIS U.S., INC.

76 SERVICE STATION NO. 2707376 • 4191 FIRST STREET PLEASANTON, CALIFORNIA

CONSTRUCTION DOCUMENTS

SITE MAP WITH PROPOSED WELL LOCATIONS

GENERAL

ARCADIS Project No. B0047296.000100003

Date OCTOBER 14, 2011

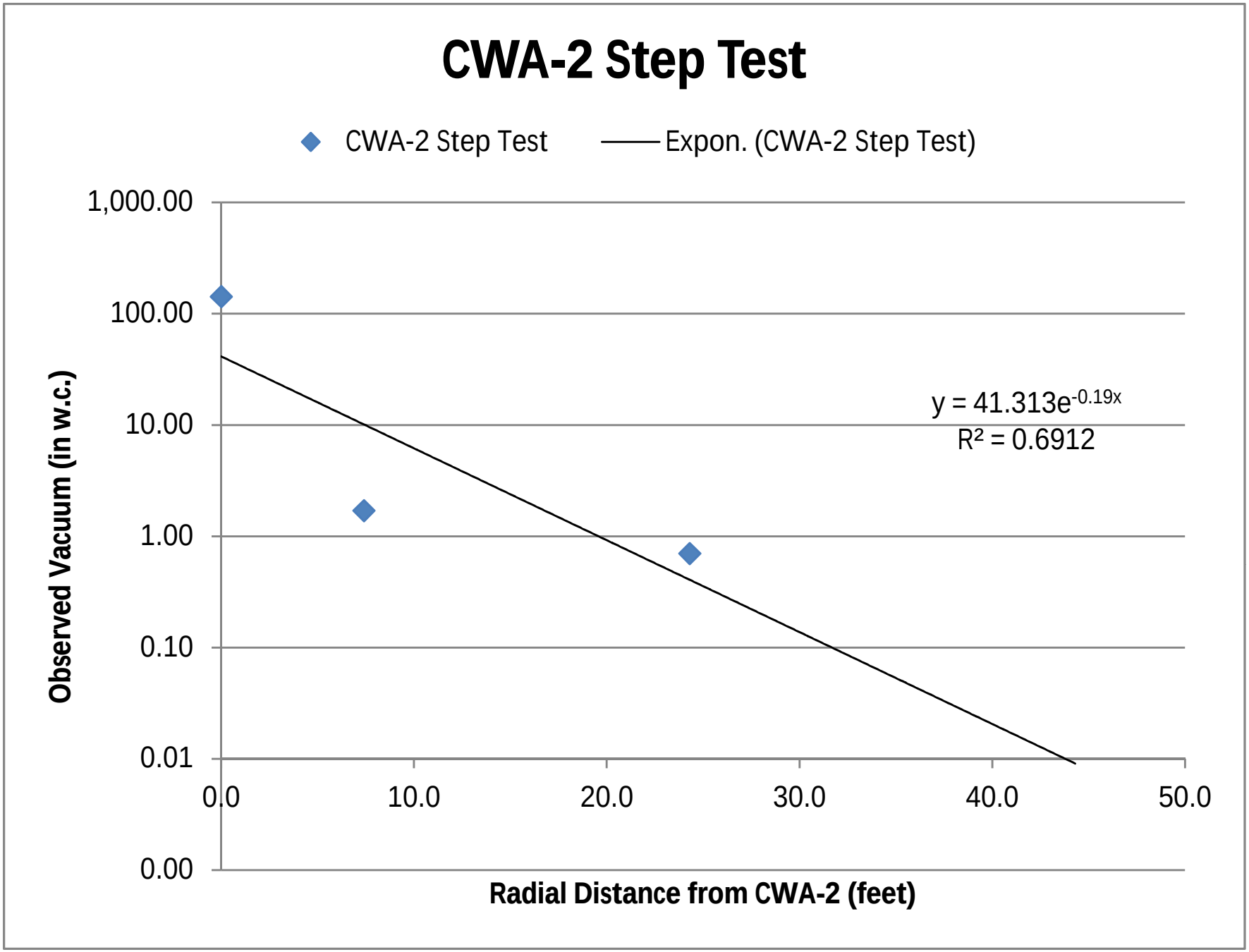
ARCADIS
100 MONTGOMERY STREET
SUITE 300
SAN FRANCISCO, CALIFORNIA
94104

1

ARCADIS

Attachment 1

Graphical ROI Determination


CWA-2 Step Test
CWA-2 Step Test
Expon. (CWA-2 Step Test)
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100.00
10.00
1.00
0.10
0.01
0.00
Observed Vacuum (in w.c.)
y = 41.313e-0.19x
R² = 0.6912
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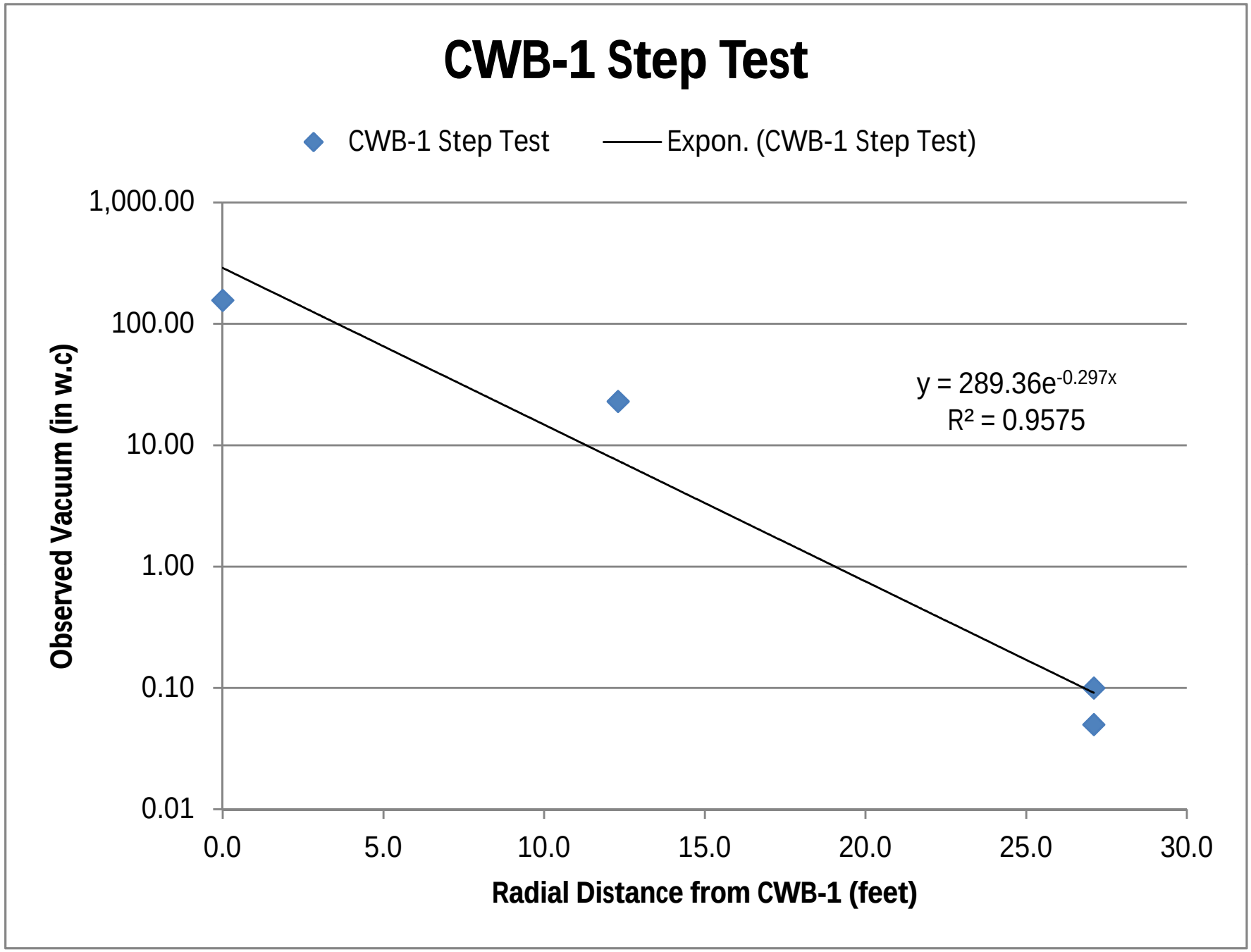
10.0
20.0
30.0
40.0
50.0
Radial Distance from CWA-2 (feet)


CWB-1 Step Test
CWB-1 Step Test
Expon. (CWB-1 Step Test)
1,000.00
100.00
10.00
1.00
0.10
0.01
Observed Vacuum (in w.c)
y = 289.36e-0.297x
R² = 0.9575
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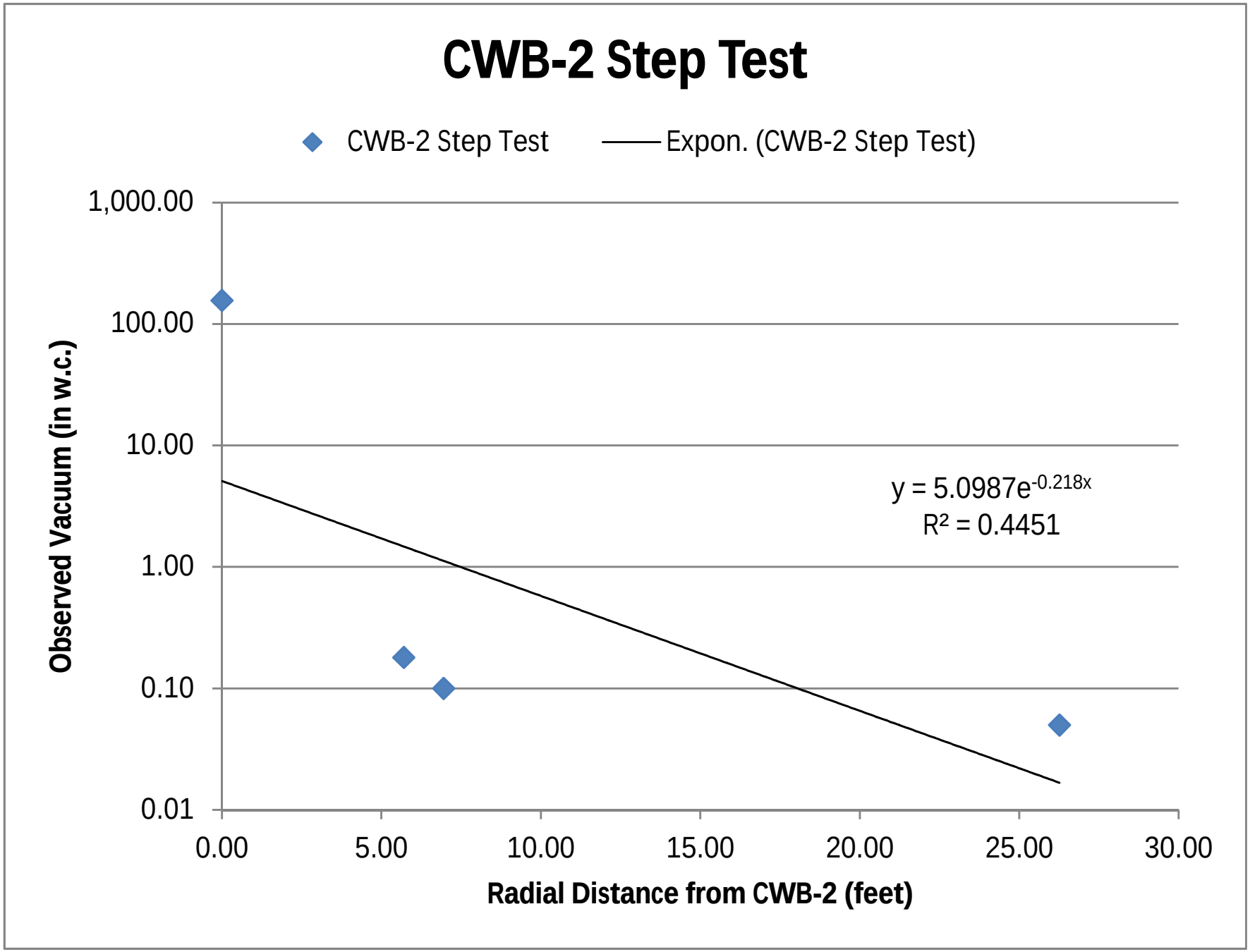
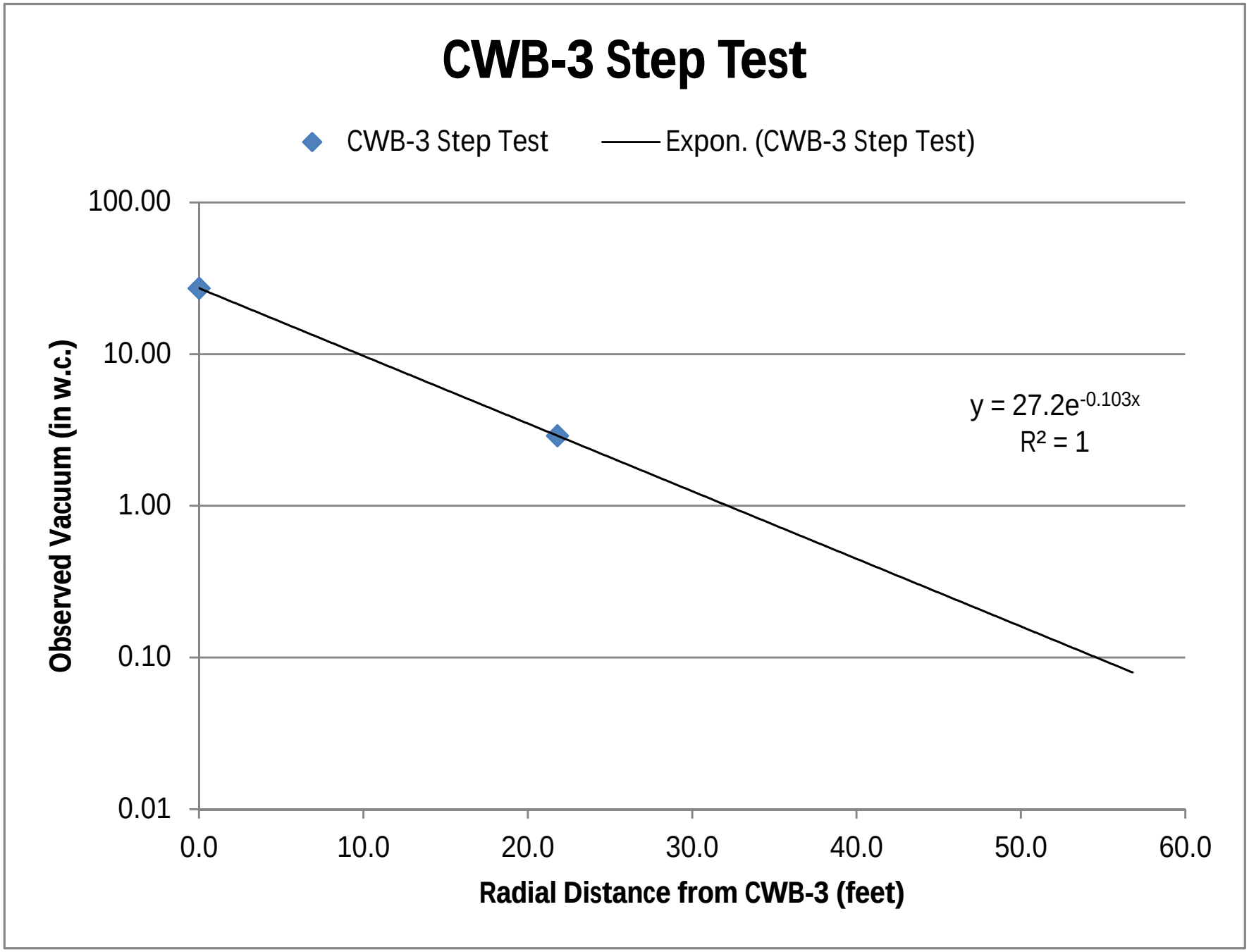
5.0
10.0
15.0
20.0
25.0
30.0
Radial Distance from CWB-1 (feet)


CWB-2 Step Test
CWB-2 Step Test
Expon. (CWB-2 Step Test)
1,000.00
100.00
10.00
1.00
0.10
0.01
Observed Vacuum (in w.c.)
y = 5.0987e-0.218x
R² = 0.4451
0.00
5.00
10.00
15.00
20.00
25.00
30.00
Radial Distance from CWB-2 (feet)


CWB-3 Step Test
CWB-3 Step Test
Expon. (CWB-3 Step Test)
100.00
10.00
1.00
0.10
0.01
Observed Vacuum (in w.c.)
y = 27.2e-0.103x
R² = 1
0.0
10.0
20.0
30.0
40.0
50.0
60.0
Radial Distance from CWB-3 (feet)

ARCADIS

Attachment 2

Roya C. Kambin
Project Manager
Marketing Business Unit

Chevron Environmental Management Company
6101 Bollinger Canyon Road
San Ramon, CA 94583
Tel (925) 790-6270
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February 20, 2012

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Union Oil of California – Project Manager

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www.arcadis-us.com

ENVIRONMENT

Jerry Wickham, PG, CEH, CHG
Senior Hazardous Materials Specialist
Alameda County Environmental Health Services
1131 Harbor Bay Parkway Suite 250
Alameda, California 94502

Subject:
Revised Remedial Design
Response to ACEH Comments
Unocal Site 7376
4191 First Street
Pleasanton California
Alameda County Fuel Leak Case No. RO0000361

Date:
February 20, 2012

Contact:
Katherine Brandt

Phone:
510.596.9675

Email:
Katherine.Brandt
@arcadis-us.com

Our ref:
B0047296.0001

Dear Mr. Wickham:

On behalf of Chevron Environmental Management Company, for itself and as Attorney-in-Fact for Union Oil Company of California (hereinafter "EMC"), ARCADIS U.S., Inc (ARCADIS) has prepared this letter in response to technical comments from Alameda County Environmental Health Services (ACEH) regarding ARCADIS', "Revised Remedial Design," dated October 14, 2011 associated with the above referenced site. Technical comments provided by ACEH in their letter dated November 16, 2011 are provided in ***bold/italics*** below. A response follows each comment.

1. ***Radius of Influence and Number of SVE Wells. The Revised Remedial Design indicates that the radius of influence (ROI) was not calculated correctly and proposes the use of higher ROI values for design. As a result, the Revised Design incorporates a significantly reduced number of extraction wells for the soil vapor extraction (SVE) system. Given that the site stratigraphy appears to be complex with possible horizontal and vertical discontinuities, it is not clear that the proposed well design is conservative enough to ensure that the system will be able to adequately treat the targeted area and vertical intervals. We request that you review the site-specific conditions and re-consider the design in light of the site heterogeneity. Upon review, if you believe that the proposed design is adequate, please include a sufficient number of vapor monitoring points in the design to allow assessment of the system performance during SVE operations.***

After in-depth review of cross-sections developed from site boring logs, the conservative ROI presented within ARCADIS' "Revised Remedial Design" will deliver effective flow coverage despite site heterogeneity. The revised design ROI for the shallower zone (sands/gravels) and deeper zone (finer grained soil) is 30 feet and 20 feet, respectively. These conservative ROI estimates are based on the smallest ROI observed during previous pilot testing efforts to ensure adequate coverage at the site. Additionally, well construction and well layout details were designed to address interpreted lithologic heterogeneities. The majority of clay lenses or pockets causing discontinuity within the formation exist on-site. Dual-nested shallow and deep SVE wells are proposed onsite to address possible decreased influence across vertical and horizontal gradients within the formation. Screen intervals will be also open to variation in the field to compensate for any unanticipated impermeable layers observed during well installation.

Onsite monitoring wells OWA-1 and CWA-3 will be used to monitor shallow induced vacuum gradients (Figure 1A). In addition, proposed vapor extraction wells VE-1A, VE-2, and VE-3 will be used to monitor shallow induced vacuum gradients when not in operation. Onsite wells OWA-2, OWA-3, CWA-1, and CWA-2 will be used to monitor deep induced vacuum gradients.

Offsite monitoring well CWB-3 will be used to monitor shallow induced vacuum gradients. Offsite monitoring wells CWB-2 and CWB-3 will be used to monitor deep induced vacuum gradients (Figure 1B). In addition, proposed vapor extraction wells VE-4, VE-5B, VE-6, and VE-7 will be used to monitor deep induced vacuum gradients when not in operation.

2. ***Air Sparging and Removal of Groundwater Extraction. The proposed incorporation of air sparging in lieu of groundwater extraction is acceptable. In the Revised Remedial Design requested below, please include the three proposed air sparging wells into the remedial system. Groundwater extraction may be used as a contingency.***

   The three proposed offsite air sparge well (AS-1, AS-2, and AS-3) locations are shown on Figures 1A and 1B. The remediation compound was designed to allow space for contingency groundwater extraction system components. A sewer cleanout connection will be made during trenching activities to allow

for post-treatment water discharge, should groundwater extraction be necessary.

3. ***Compound Location and Abatement Equipment. In the Revised Remedial Design requested below, please include a new location for the system compound. The size of the abatement equipment may be modified as necessary to match the anticipated treatment volumes.***

   The new proposed remediation compound location is shown on Figures 1A and 1B. The new location selection process included evaluation of accessibility, minimal disturbance to service station operations, distance from the nearby office building, and structural stability of existing topographic conditions.

4. ***GeoTracker. A review of the State Water Resources Control Board's (SWRCB) GeoTracker website indicates the most recent report entitled, "Revised Remedial Design, Unocal Site 7376, 4191 First Street, Pleasanton, CA," dated October 14, 2011, was not uploaded to GeoTracker. Please upload this report and all future reports to GeoTracker as required pursuant to California Code of Regulations, Title 23, Division 3, Chapter 16, Article 12, Sections 2729 and 2729.1 by state regulations.***

   The report entitled "*Revised Remedial Design, Unocal Site 7376, 4191 First Street, Pleasanton, CA*," dated October 14, 2011 has been uploaded to GeoTracker. This response to comments document, as well as any future reports, will also be uploaded to GeoTracker.

Schedule

The timeframe for implementation of the Revised RAP assumes approval to proceed is received by ACEH by March 30, 2012. ARCADIS is prepared to begin well installation activities three weeks following approval from the ACEH. Installation of system components and startup will follow the well installation. If delays are experienced due to Pacific Gas & Electric, a temporary system will be employed to start the remedial efforts.

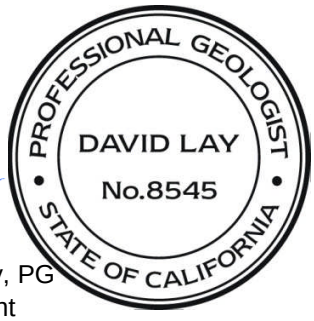
If you have any questions or comments regarding the contents of this letter please contact Ms. Katherine Brandt of ARCADIS at 510.596.9675 or by email at Katherine.Brandt@arcadis-us.com.

Sincerely,

ARCADIS U.S., Inc.

Katherine Brandt
Certified Project Manager

David W. Lay, PG
Vice President



Enclosures:

Figure 1A	Site Map with Proposed Shallow Well and Trench Locations
Figure 1B	Site Map with Proposed Deep Well and Trench Locations

Copies:

Roya Kambin, Union Oil of California
Danielle Stefani, Livermore Pleasanton Fire Department
Cheryl Dizon (QIC 8021), Zone 7 Water Agency
Les Hausrath, Wendel, Rosen, Black & Dean
Christine Noma, Wendel, Rosen, Black & Dean
Rory MacNeil, Alameda County Public Works
Donna Drogos, Alameda County Environmental Health Services
De L Liu and Na Li
Henry O. Armour
CD & PWS Enterprises, Inc.
Mr. Bill Borgh, ConocoPhillips Company

TESSA PLACE
CALI COURT
BENJAMIN COURT
RESIDENTIAL
RESIDENTIAL
FORMER RAILROAD RIGHT-OF-WAY
MW-7
MW-8
GWE-2
OWB-1/2/3
AS-1
GWE-1
MW-5
AS-2
CWB-3
AS-3
CWB-2
CWB-1
VE-7
VE-6
BUILDING
WALKWAY
WALKWAY
PLANTER
PLANTER
MW-10
STORAGE BUILDING
DRIVEWAY
PROPOSED REMEDIATION SYSTEM LOCATION
VE-4
PLANTER
VE-1A/1B
OWA-1/2/3
FORMER FUEL OIL UST
VE-5A/5B
CWA-1
CWA-2
CWA-3
MW-6
MW-2B
MW-2C
VE-2
MW-2
VAPOR RECOVERY SYSTEM (APPROX LOCATION)
PLANTER
UST
UST
DRIVEWAY
VE-3A/3B
MW-3
MW-3B
TO PG&E GAS SUPPLY LINE
SECONDARY ELECTRICAL BOX
SANITARY SEWER CLEANOUT CONNECTION
FIRST STREET
MW-1
MW-1B
DISPENSER ISLANDS
DRIVEWAY

LEGEND

- Approximate Property Line
- Fence
- Approximate Location of Underground Petroleum Pipeline (KinderMorgan)
- Approximate Location of Fiber Optic Utility Line
- MW-12 — Groundwater monitoring well Locaton
- OWB-1/2/3 — Observation Well Location (Delta, 2010)
- CWA-3 — Soil Vapor Extraction Well Location (Delta, 2010)
- MW-2 — Abandoned Well Location
- Proposed SVE, Electrical, and Gas Trenching Location
- GWE-1 — Contigency Groundwater Extraction Well Location
- VE-1A/1B — Proposed Dual Nested Vapor Extraction Well Location
- VE-2 — Proposed Deep Vapor Extraction Well Location
- AS-1 — Proposed Air Sparge Well Location
- CWB-2 — Existing Deep Soil Vapor Extraction Well Location To Be Operated (Delta, 2010)
- CWA-3 — Proposed Shallow System Performance Monitoring Well (Existing)
- Shallow SVE Well Radius of Influence - 30 feet
- Approximate Shallow Area of Soil Hydrocarbon Impacts (20 - 30 feet below ground surface)

REFERENCE

SITE PLAN ADAPTED FROM A SURVEY BY MIDCOAST ENGINEERS, APRIL 16, 2011 AND SITE PLANS BY TRC, 2008 AND GETTLER-RYAN, AUGUST 2000.

N

0 15' 30'

SCALE(S) AS INDICATED

THIS BAR REPRESENTS ONE INCH ON THE — USE TO VERIFY FIGURE REPRODUCTION

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MICHAEL P. FLEISCHNER
Professional Engineer's No.: C65705 EXP. 09/30/2013

State	Date Signed	Project Mgr.
CA		KAB
Designed by	Drawn by	Checked by

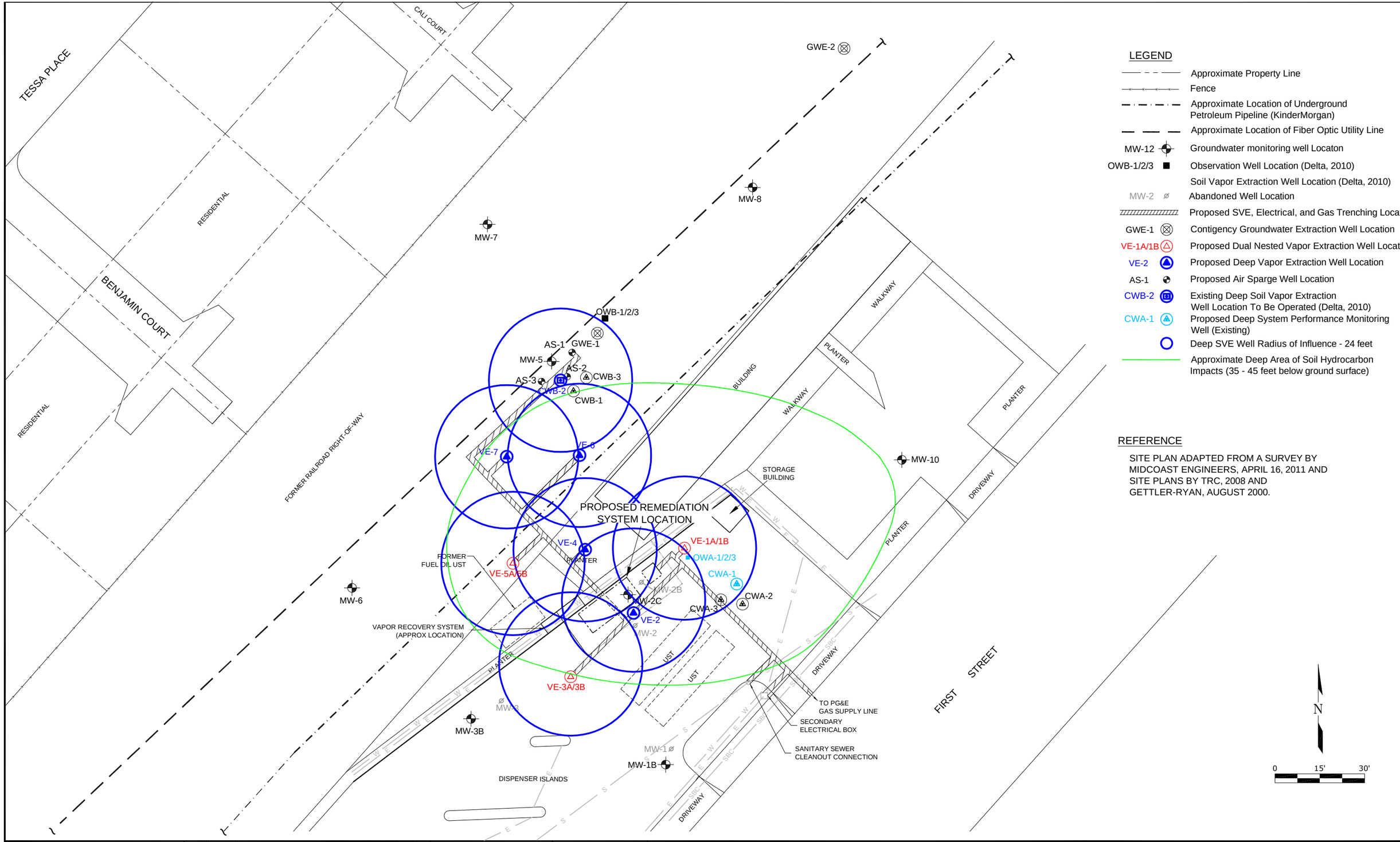
ARCADIS U.S., INC.

76 SERVICE STATION NO. 2707376 • 4191 FIRST STREET PLEASANTON, CALIFORNIA
CONSTRUCTION DOCUMENTS

SITE MAP WITH PROPOSED SHALLOW WELL AND TRENCH LOCATIONS

ARCADIS Project No. B0047296.000100003
Date JANUARY 20, 2012
ARCADIS 100 MONTGOMERY STREET SUITE 300 SAN FRANCISCO. CALIFORNIA

1A



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- Fence
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- VE-2 — Proposed Deep Vapor Extraction Well Location
- AS-1 — Proposed Air Sparge Well Location
- CWB-2 — Existing Deep Soil Vapor Extraction Well Location To Be Operated (Delta, 2010)
- CWA-1 — Proposed Deep System Performance Monitoring Well (Existing)
- Deep SVE Well Radius of Influence - 24 feet
- Approximate Deep Area of Soil Hydrocarbon Impacts (35 - 45 feet below ground surface)

REFERENCE

SITE PLAN ADAPTED FROM A SURVEY BY MIDCOAST ENGINEERS, APRIL 16, 2011 AND SITE PLANS BY TRC, 2008 AND GETTLER-RYAN, AUGUST 2000.

CITY: DIVGROUP: DB: LD: PIC: PM: TM: LYR(ON=*;OFF=*REF*
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SCALE(S) AS INDICATED

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No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MICHAEL P. FLEISCHNER
Professional Engineer's No.: C65705 EXP. 09/30/2013

State	Date Signed	Project Mgr.
CA		KAB
Designed by	Drawn by	Checked by

ARCADIS U.S., INC.

76 SERVICE STATION NO. 2707376 • 4191 FIRST STREET PLEASANTON, CALIFORNIA

CONSTRUCTION DOCUMENTS

SITE MAP WITH PROPOSED DEEP WELL AND TRENCH LOCATIONS

ARCADIS Project No. B0047296.000100003

Date JANUARY 20, 2012

ARCADIS
100 MONTGOMERY STREET
SUITE 300
SAN FRANCISCO. CALIFORNIA

1B