

**Table 6-1  
Property Addresses for Consideration in Remedial Planning**

Address	Soil Excavation	Sub-Slab Soil Vapor Mitigation	SVE/Bioventing
	≤ 3 ft bgs		>3 to ≤10 ft bgs
24401 MARBELLA AVE			
24402 NEPTUNE AVE			X
24402 PANAMA AVE			
24402 RAVENNA AVE	X		X
24403 NEPTUNE AVE	X		X
24403 RAVENNA AVE			X
24405 MARBELLA AVE			
24406 MARBELLA AVE	X		X
24406 NEPTUNE AVE		X	X
24406 PANAMA AVE	X		X
24406 RAVENNA AVE	X		X
24409 NEPTUNE AVE	X		X
24409 RAVENNA AVE			X
24410 PANAMA AVE			
24411 MARBELLA AVE	X		X
24411 PANAMA AVE	X		X
24412 MARBELLA AVE	X	X	X
24412 RAVENNA AVE	X		X
24413 NEPTUNE AVE	X		X
24413 RAVENNA AVE			X
24416 MARBELLA AVE	X		X
24416 NEPTUNE AVE	X		X
24416 PANAMA AVE			
24416 RAVENNA AVE	X	X	X
24417 MARBELLA AVE			
24417 PANAMA AVE			X
24419 NEPTUNE AVE	X		X
24419 RAVENNA AVE			X
24420 PANAMA AVE	X		X
24421 PANAMA AVE	X		X
24422 MARBELLA AVE	X		X
24422 NEPTUNE AVE			X
24422 RAVENNA AVE	X		X
24423 MARBELLA AVE			
24423 NEPTUNE AVE	X	X	X
24423 RAVENNA AVE	X		X
24426 MARBELLA AVE	X		X
24426 NEPTUNE AVE			X
24426 PANAMA AVE	X		X
24426 RAVENNA AVE	X		X
24427 MARBELLA AVE			
24427 PANAMA AVE			X
24429 NEPTUNE AVE	X	X	X

**Table 6-1  
Property Addresses for Consideration in Remedial Planning**

Address	Soil Excavation	Sub-Slab Soil Vapor Mitigation	SVE/Bioventing
	≤3 ft bgs		>3 to ≤10 ft bgs
24429 RAVENNA AVE			X
24430 PANAMA AVE			
24431 PANAMA AVE	X		X
24432 MARBELLA AVE	X		X
24433 MARBELLA AVE	X	X	X
24436 PANAMA AVE	X		X
24502 MARBELLA AVE	X		X
24502 NEPTUNE AVE			X
24502 PANAMA AVE			
24502 RAVENNA AVE	X		X
24503 MARBELLA AVE			
24503 NEPTUNE AVE	X		X
24503 PANAMA AVE	X		X
24503 RAVENNA AVE			X
24506 MARBELLA AVE	X	X	X
24507 MARBELLA AVE			
24508 NEPTUNE AVE	X		X
24508 PANAMA AVE		X	
24508 RAVENNA AVE	X		X
24509 NEPTUNE AVE	X		X
24509 PANAMA AVE	X		X
24509 RAVENNA AVE	X		X
24512 MARBELLA AVE	X		X
24512 NEPTUNE AVE	X		X
24512 PANAMA AVE			
24512 RAVENNA AVE	X		X
24513 NEPTUNE AVE			X
24513 PANAMA AVE	X		X
24513 RAVENNA AVE		X	X
24516 MARBELLA AVE	X		X
24517 MARBELLA AVE	X		X
24518 NEPTUNE AVE	X		X
24518 PANAMA AVE			
24518 RAVENNA AVE	X		X
24519 NEPTUNE AVE	X		X
24519 PANAMA AVE	X		X
24522 MARBELLA AVE	X		X
24522 NEPTUNE AVE	X		X
24522 PANAMA AVE			
24522 RAVENNA AVE	X		X
24523 MARBELLA AVE			
24523 NEPTUNE AVE	X		X
24523 RAVENNA AVE	X		X

**Table 6-1  
Property Addresses for Consideration in Remedial Planning**

Address	Soil Excavation	Sub-Slab Soil Vapor Mitigation	SVE/Bioventing
	≤ 3 ft bgs		>3 to ≤10 ft bgs
24526 MARBELLA AVE	X		X
24528 NEPTUNE AVE	X		X
24528 PANAMA AVE			
24529 NEPTUNE AVE	X		X
24529 PANAMA AVE			
24529 RAVENNA AVE	X		X
24532 MARBELLA AVE	X		X
24532 NEPTUNE AVE			
24532 PANAMA AVE			X
24532 RAVENNA AVE			
24533 MARBELLA AVE			
24533 PANAMA AVE			
24533 RAVENNA AVE			
24602 MARBELLA AVE			X
24602 NEPTUNE AVE			
24602 PANAMA AVE			X
24602 RAVENNA AVE			
24603 MARBELLA AVE	X	X	X
24603 NEPTUNE AVE	X		X
24603 PANAMA AVE	X		X
24603 RAVENNA AVE	X		X
24606 MARBELLA AVE	X		X
24607 MARBELLA AVE			X
24608 NEPTUNE AVE	X		X
24608 PANAMA AVE	X		X
24608 RAVENNA AVE	X		X
24609 NEPTUNE AVE	X		X
24609 PANAMA AVE	X	X	X
24609 RAVENNA AVE			
24612 MARBELLA AVE	X		X
24612 NEPTUNE AVE	X		X
24612 PANAMA AVE	X		X
24612 RAVENNA AVE	X		X
24613 MARBELLA AVE	X		X
24613 NEPTUNE AVE	X		X
24613 PANAMA AVE	X	X	X
24613 RAVENNA AVE	X		X
24616 MARBELLA AVE	X		X
24617 MARBELLA AVE	X		X
24618 NEPTUNE AVE	X		X
24618 PANAMA AVE	X		X
24618 RAVENNA AVE			
24619 NEPTUNE AVE	X		X

**Table 6-1  
Property Addresses for Consideration in Remedial Planning**

Address	Soil Excavation	Sub-Slab Soil Vapor Mitigation	SVE/Bioventing
	≤ 3 ft bgs		>3 to ≤10 ft bgs
24619 PANAMA AVE	X		X
24619 RAVENNA AVE			X
24622 MARBELLA AVE	X		X
24622 NEPTUNE AVE	X		X
24623 MARBELLA AVE	X	X	X
24623 NEPTUNE AVE	X		X
24627 MARBELLA AVE	X		X
24628 MARBELLA AVE	X		X
24628 NEPTUNE AVE			X
24629 NEPTUNE AVE	X	X	X
24632 NEPTUNE AVE*	X	X	X
24633 MARBELLA AVE	X		X
24700 MARBELLA AVE	X		X
24700 RAVENNA AVE			
24702 NEPTUNE AVE	X		X
24702 PANAMA AVE	X		X
24703 MARBELLA AVE	X		X
24703 NEPTUNE AVE	X		X
24703 RAVENNA AVE	X		X
24706 MARBELLA AVE	X		X
24706 RAVENNA AVE	X		X
24707 MARBELLA AVE			
24708 PANAMA AVE	X		X
24709 NEPTUNE AVE	X	X	X
24709 PANAMA AVE	X		X
24709 RAVENNA AVE	X		X
24710 MARBELLA AVE	X		X
24712 NEPTUNE AVE	X	X	X
24712 PANAMA AVE	X		X
24712 RAVENNA AVE	X		X
24713 MARBELLA AVE	X		X
24713 PANAMA AVE	X		X
24713 RAVENNA AVE	X		X
24715 NEPTUNE AVE	X		X
24716 MARBELLA AVE	X		X
24716 RAVENNA AVE	X		X
24717 MARBELLA AVE	X		X
24718 NEPTUNE AVE	X		X
24718 PANAMA AVE	X		X
24719 NEPTUNE AVE	X		X
24719 PANAMA AVE	X		X
24719 RAVENNA AVE	X		X
24722 MARBELLA AVE	X		X

**Table 6-1  
Property Addresses for Consideration in Remedial Planning**

Address	Soil Excavation	Sub-Slab Soil Vapor Mitigation	SVE/Bioventing
	≤ 3 ft bgs		>3 to ≤10 ft bgs
24722 NEPTUNE AVE		X	
24722 PANAMA AVE	X		X
24722 RAVENNA AVE	X		X
24723 MARBELLA AVE	X	X	X
24723 RAVENNA AVE	X		X
24725 NEPTUNE AVE			
24726 MARBELLA AVE			
24726 RAVENNA AVE			
24727 MARBELLA AVE	X		X
24728 NEPTUNE AVE	X		X
24728 PANAMA AVE	X		X
24729 NEPTUNE AVE			
24729 PANAMA AVE			
24729 RAVENNA AVE			
24732 MARBELLA AVE	X		X
24732 NEPTUNE AVE	X		X
24732 PANAMA AVE			
24732 RAVENNA AVE	X		X
24733 MARBELLA AVE	X		X
24733 PANAMA AVE			
24733 RAVENNA AVE	X		X
24735 NEPTUNE AVE	X		X
24736 MARBELLA AVE			
24736 RAVENNA AVE	X		X
24737 MARBELLA AVE	X		X
24738 NEPTUNE AVE	X	X	X
24738 PANAMA AVE	X		X
24739 NEPTUNE AVE	X		X
24739 PANAMA AVE	X		X
24739 RAVENNA AVE	X		X
24740 MARBELLA AVE	X		X
24741 MARBELLA AVE		X	
24743 RAVENNA AVE	X		X
24744 MARBELLA AVE	X	X	X
24748 RAVENNA AVE	X		X
24749 RAVENNA AVE	X	X	X
24752 RAVENNA AVE	X		X
24802 PANAMA AVE	X		X
24803 NEPTUNE AVE	X		X
24803 PANAMA AVE	X		X
24809 NEPTUNE AVE	X		X
24809 PANAMA AVE	X		X
24812 PANAMA AVE			

**Table 6-1  
Property Addresses for Consideration in Remedial Planning**

Address	Soil Excavation	Sub-Slab Soil Vapor Mitigation	SVE/Bioventing
	≤ 3 ft bgs		>3 to ≤10 ft bgs
24813 PANAMA AVE	X		X
24815 NEPTUNE AVE	X		X
24818 PANAMA AVE	X		X
24819 PANAMA AVE	X		X
24822 PANAMA AVE	X		X
24823 PANAMA AVE	X		X
24825 NEPTUNE AVE			
24828 PANAMA AVE	X		X
24829 PANAMA AVE			X
24832 PANAMA AVE			
24833 PANAMA AVE			X
24838 PANAMA AVE	X		X
24904 NEPTUNE AVE			X
24912 NEPTUNE AVE			X
301 244TH ST			
305 244TH ST	X		X
311 244TH ST	X		X
317 244TH ST	X		X
321 244TH ST	X		X
327 244TH ST			
331 244TH ST	X		X
337 244TH ST			
341 244TH ST			
344 249TH ST	X		X
345 249TH ST			X
347 244TH ST			
348 248TH ST	X	X	X
348 249TH ST			X
351 244TH ST	X		X
352 249TH ST		X	X
353 249TH ST	X		X
354 248TH ST	X		X
357 244TH ST			
357 249TH ST			X
358 249TH ST	X		X
360 248TH ST	X		X
361 244TH ST			
362 249TH ST			
363 249TH ST			X
364 248TH ST	X		X
367 244TH ST	X		X
367 249TH ST			X
368 249TH ST	X		X

**Table 6-1  
Property Addresses for Consideration in Remedial Planning**

Address	Soil Excavation	Sub-Slab Soil Vapor Mitigation	SVE/Bioventing
	≤ 3 ft bgs		>3 to ≤10 ft bgs
373 249TH ST	X		X
374 248TH ST	X		X
374 249TH ST	X		X
377 244TH ST			
377 249TH ST	X		X
378 249TH ST	X	X	X
383 249TH ST	X	X	X
402 249TH ST	X		X
408 249TH ST			
412 249TH ST	X		X

"X" - Included based on Human Health and/or Soil Leaching to Groundwater Evaluation in HHRA

Soil excavation scenario based on ≤ 5 feet below ground surface (bgs) evaluation in HHRA

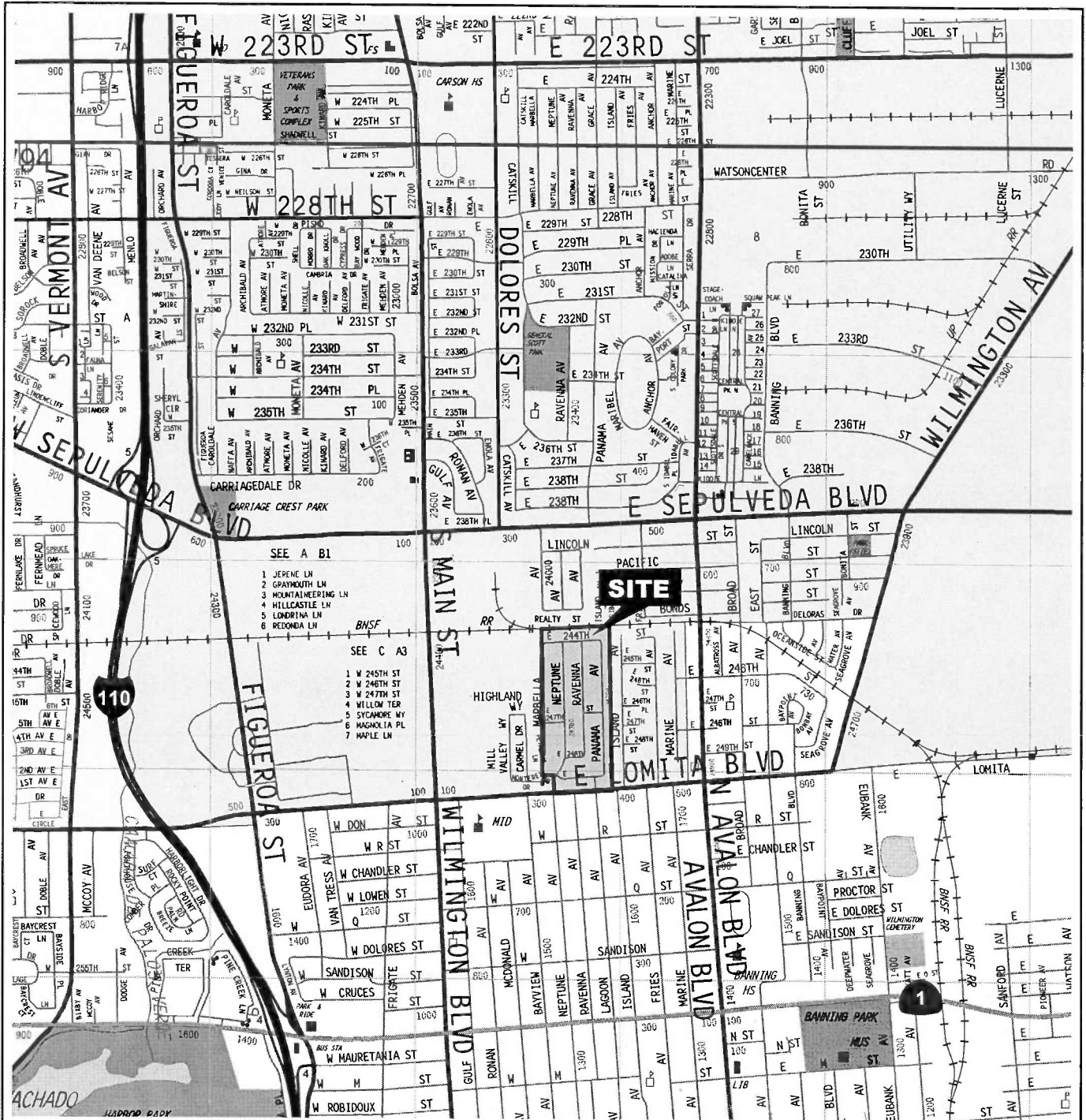
SVE/Bioventing scenario based on both ≤ 5 feet bgs and > 5 to ≤ 10 feet bgs evaluation in HHRA

Soil vapor excluding background contribution of THMs

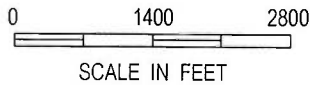
\* Property identified for sub-slab mitigation based on methane detection at 0.58%, slightly above the methane SSCG of 0.5%

**FIGURES**





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**SITE VICINITY MAP**

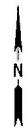
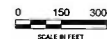
Project No.: 49194119	Date: March 2014	Project: Former KAST Property	Figure 2-1
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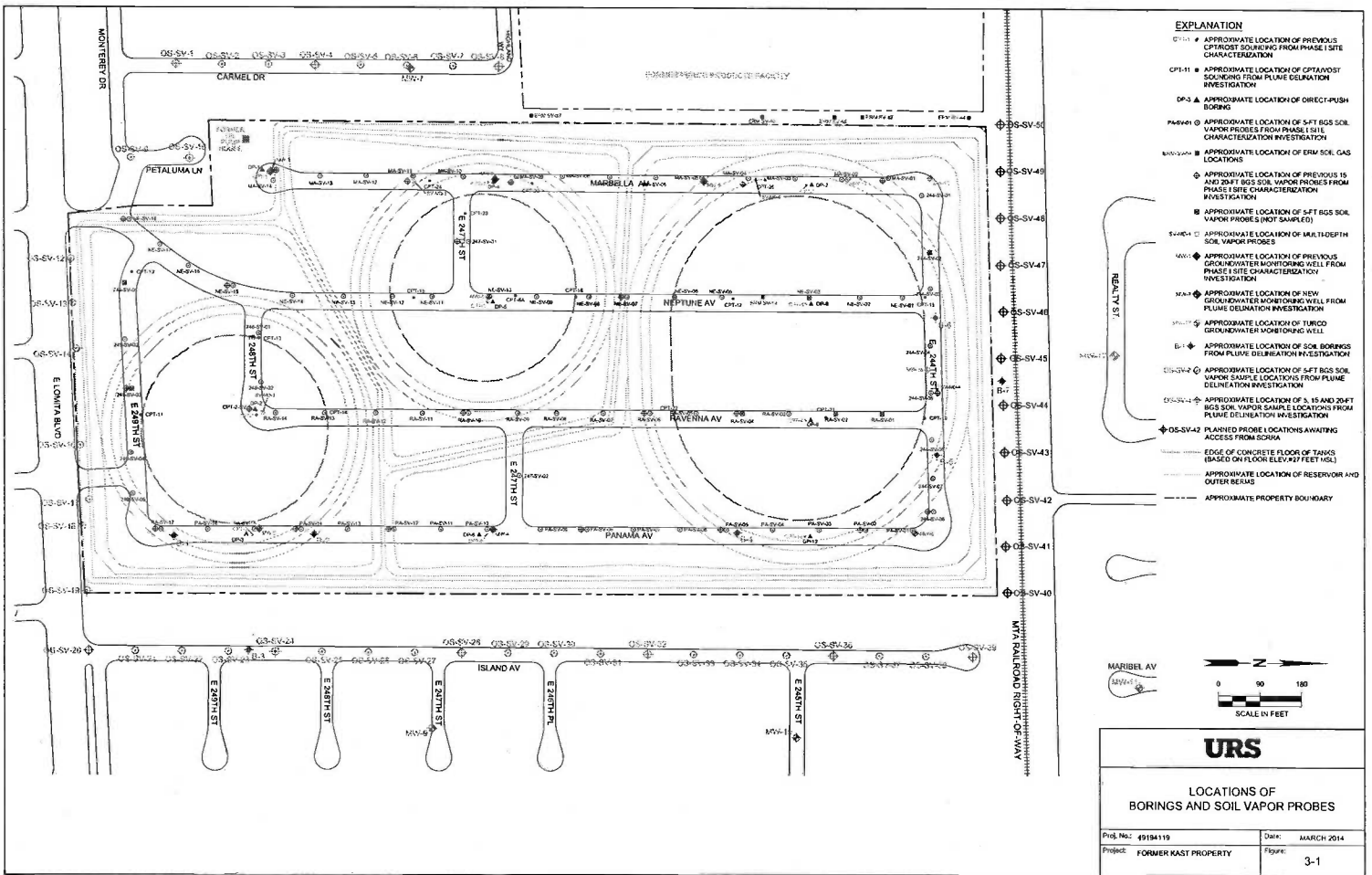
**URS**

LOCATION MAP  
SHOWING SITE AND SURROUNDING  
PROPERTIES AND FEATURES

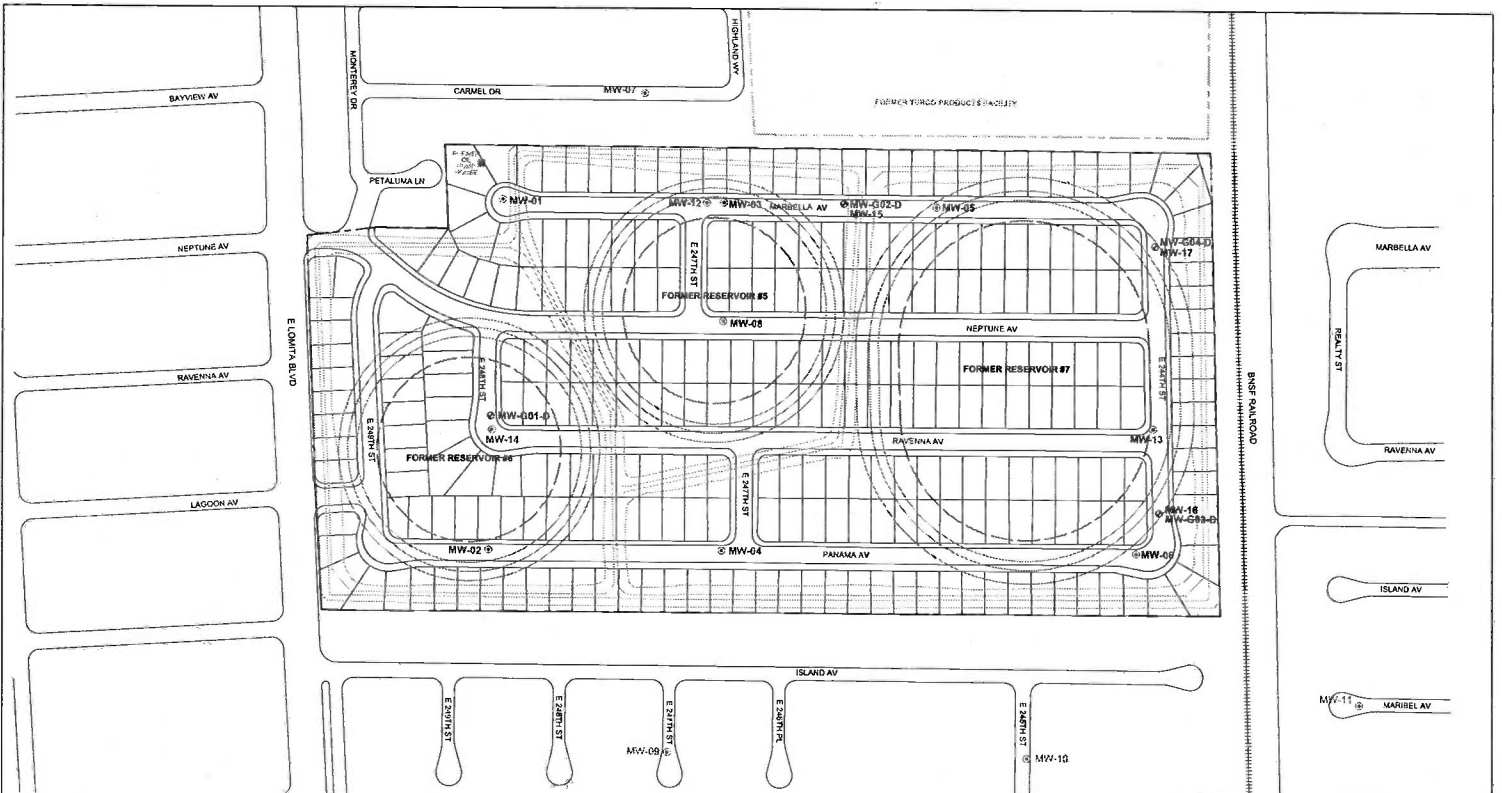


Proj No: 49104119	Date: MARCH 2014
Project: FORMER KAST PROPERTY	Figure: 2-2

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© 2011 URS Consultants, Inc. Former Kast Property RMP-SVE Figure 3-1 Borings and Soil Vapor Probes. URS uses 3-102014 1033 A11, Title block 3-102014 1033 A11 by URS, 03/08/14

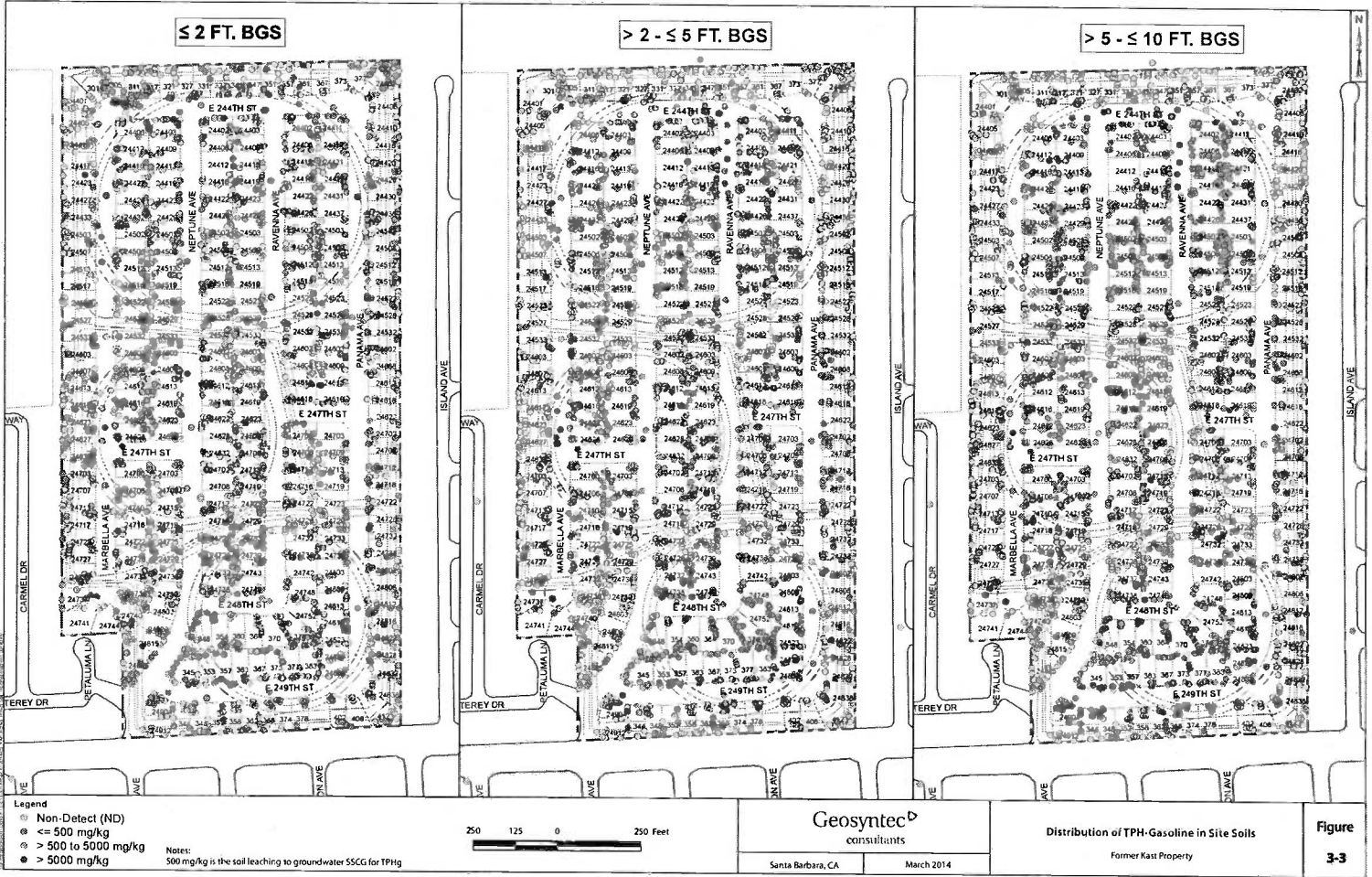


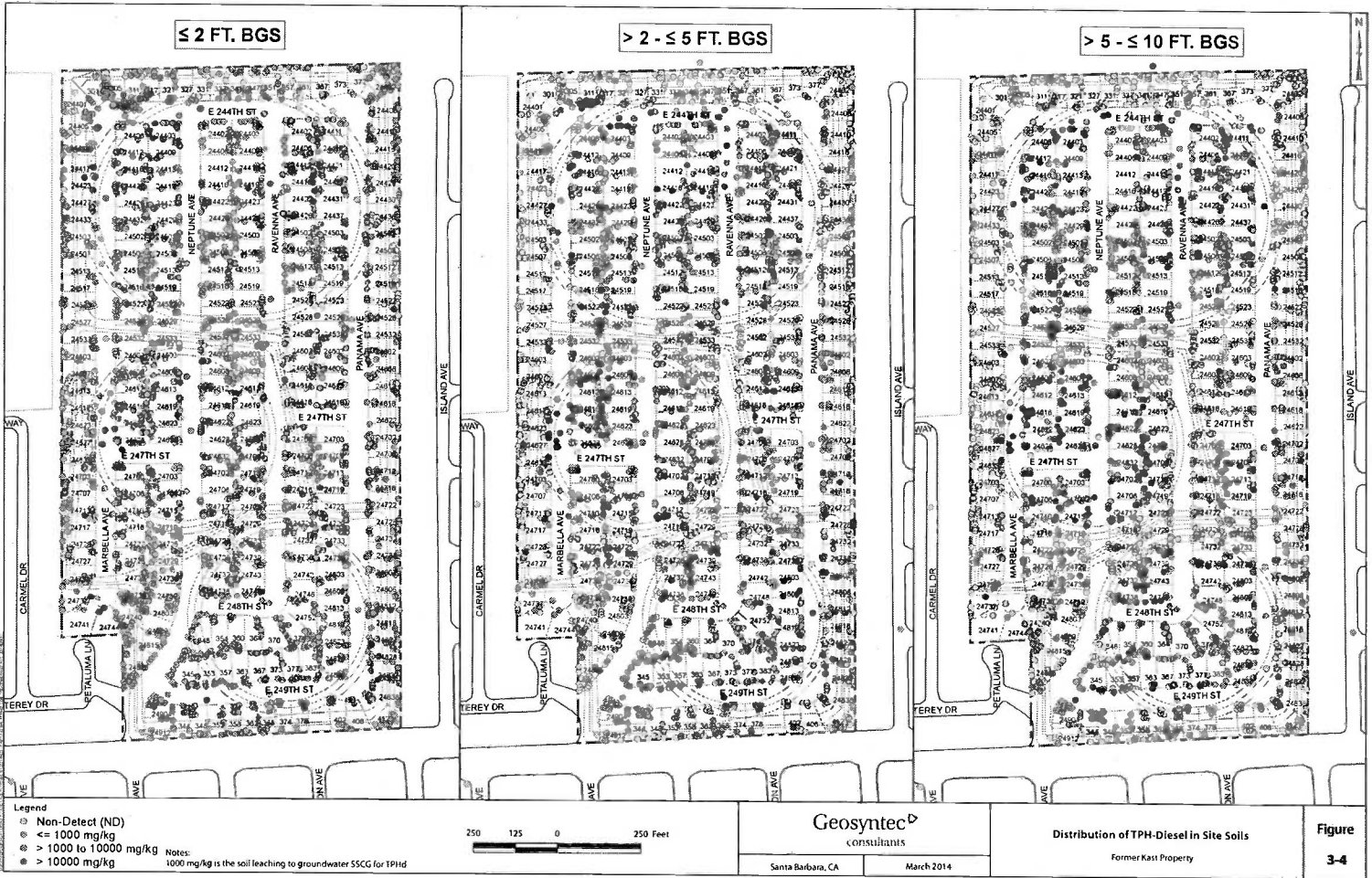
**EXPLANATION**

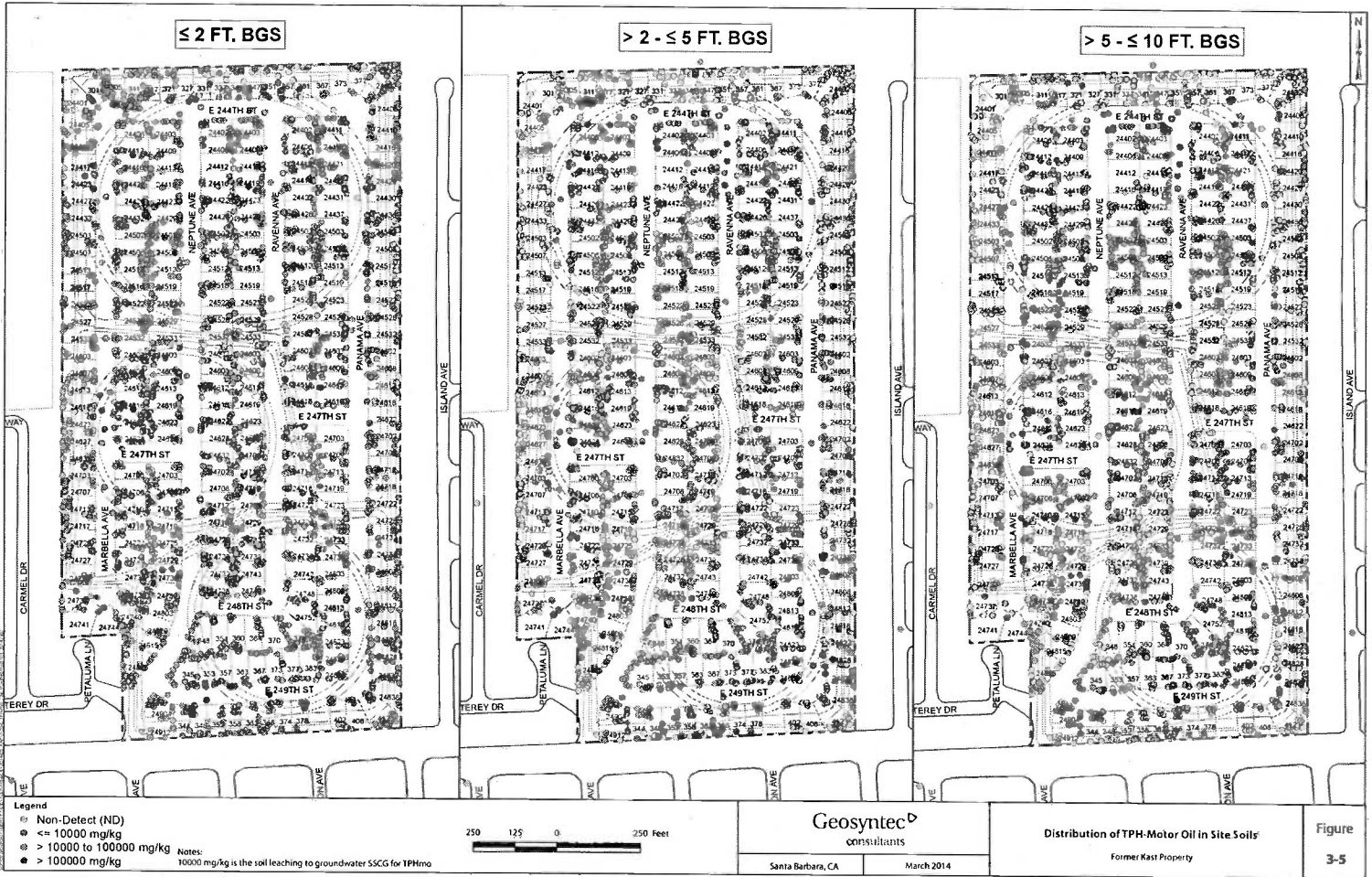
- MW-001-D ◊ APPROXIMATE LOCATION OF KAST GAGE MONITORING WELL
- MW-10 ⊕ APPROXIMATE LOCATION OF SHALLOW WATER-TABLE MONITORING WELL
- APPROXIMATE SITE BOUNDARY

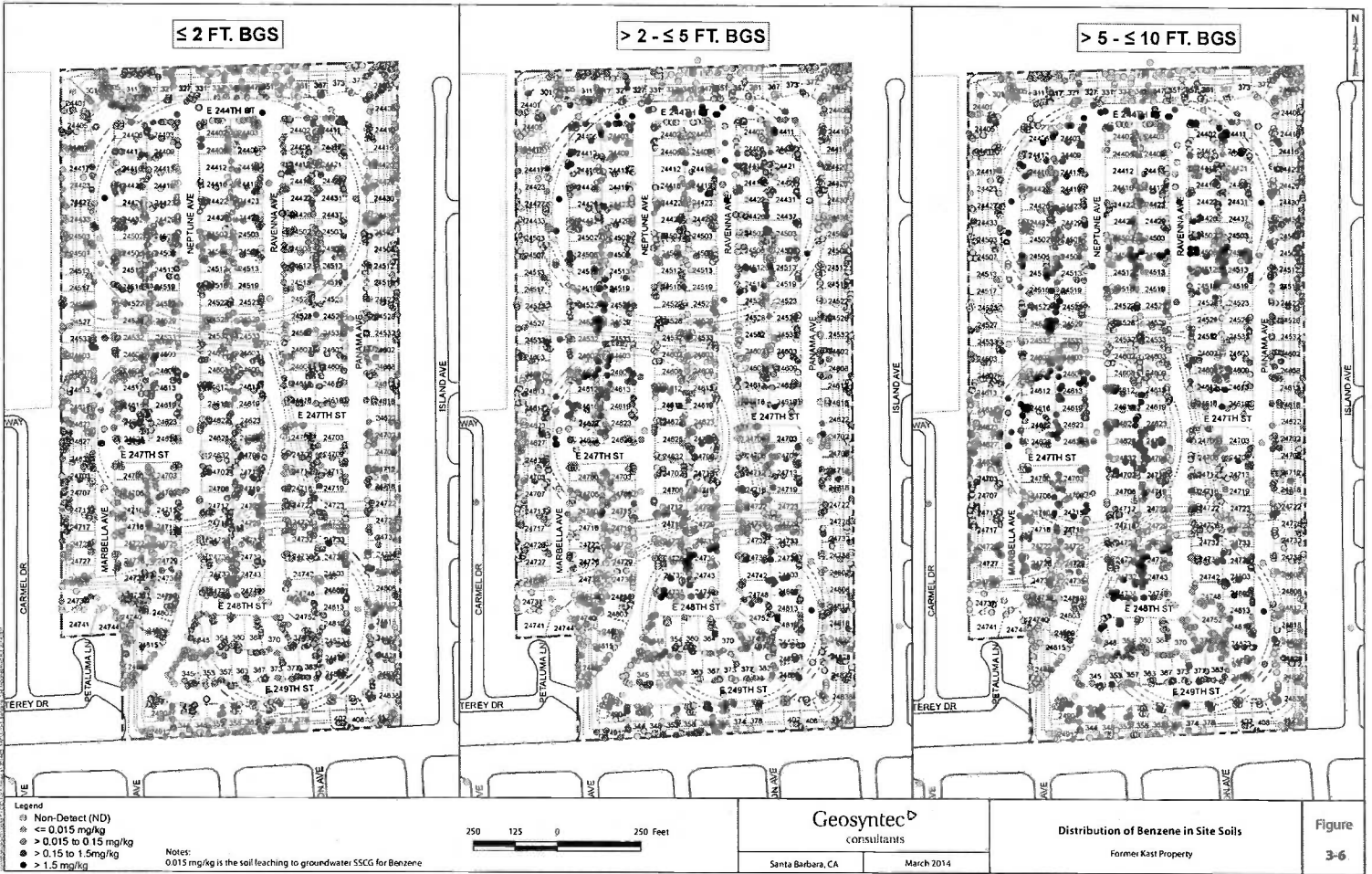


<b>URS</b>	
LOCATIONS OF GROUNDWATER MONITORING WELLS	
Proj. No: 49194119	Date: MARCH 2014
Project: FORMER KAST PROPERTY	Figure: 3-2









≤ 2 FT. BGS

> 2 - ≤ 5 FT. BGS

> 5 - ≤ 10 FT. BGS

Legend  
 ○ Non-Detect (ND)  
 ● ≤ 0.015 mg/kg  
 ◐ > 0.015 to 0.15 mg/kg  
 ● > 0.15 to 1.5 mg/kg  
 ● > 1.5 mg/kg

Notes:  
 0.015 mg/kg is the soil leaching to groundwater SSCG for Benzene

250 125 0 250 Feet

Geosyntec<sup>®</sup>  
 consultants

Santa Barbara, CA March 2014

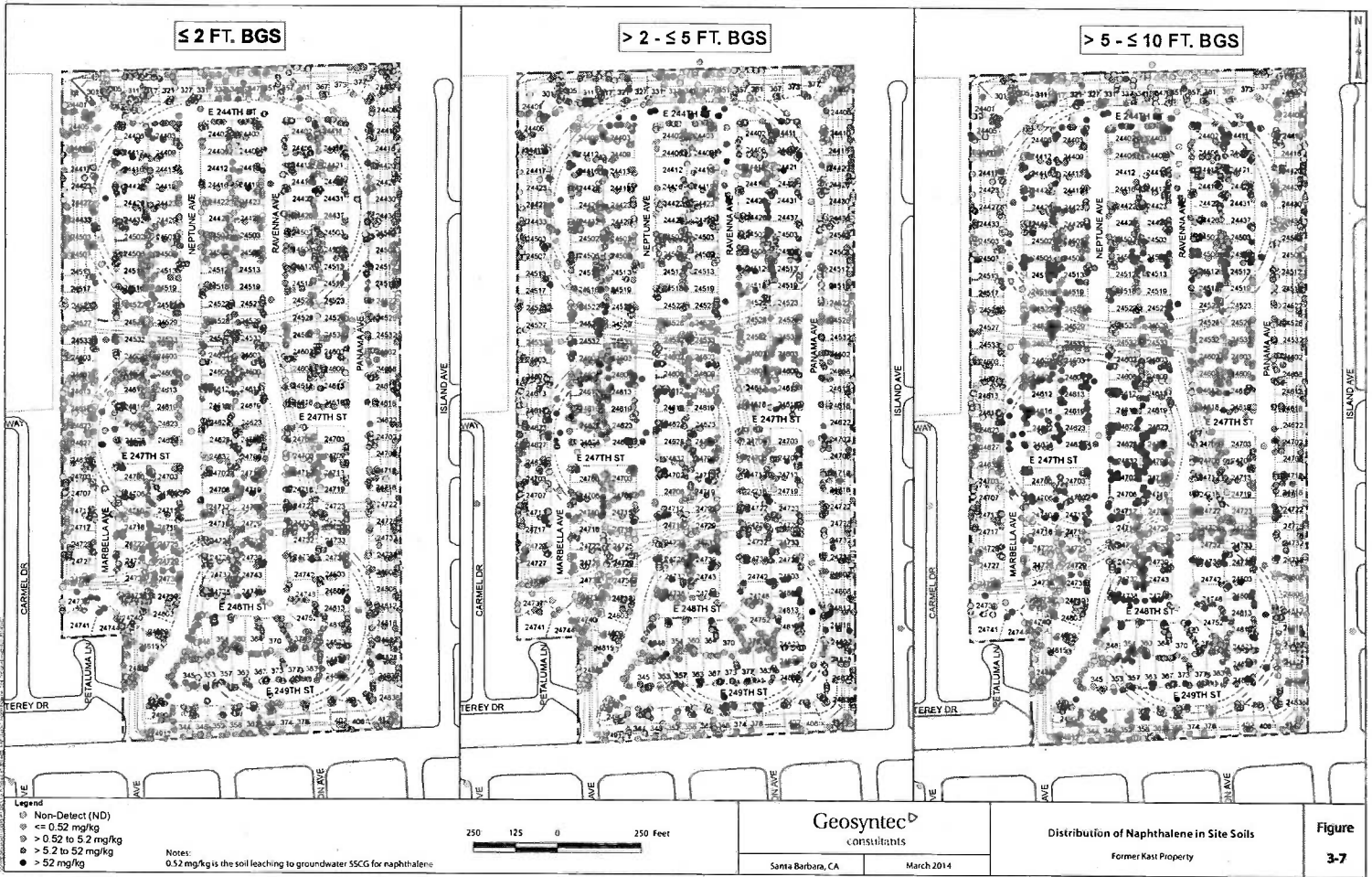
Distribution of Benzene in Site Soils

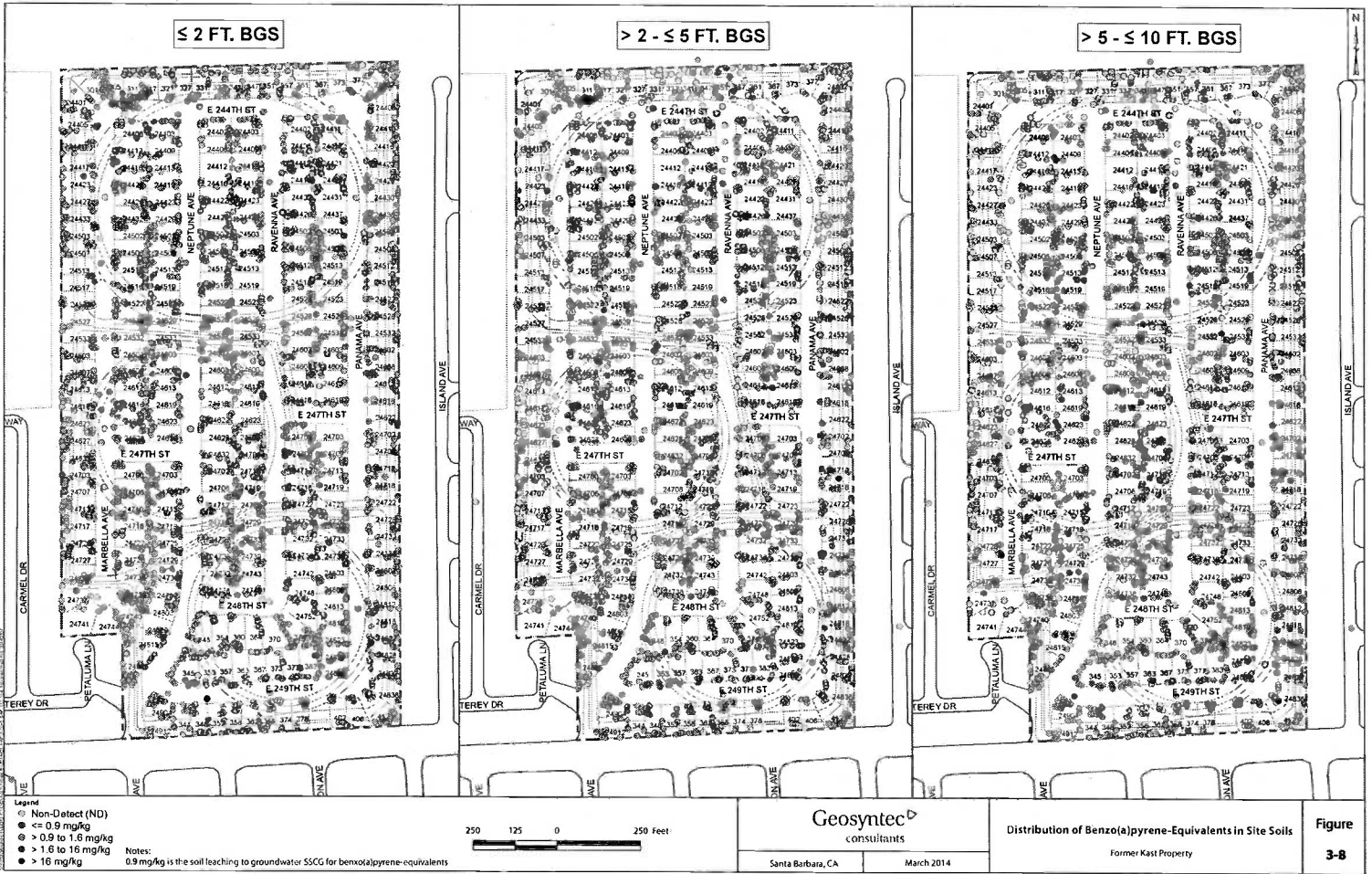
Former Kast Property

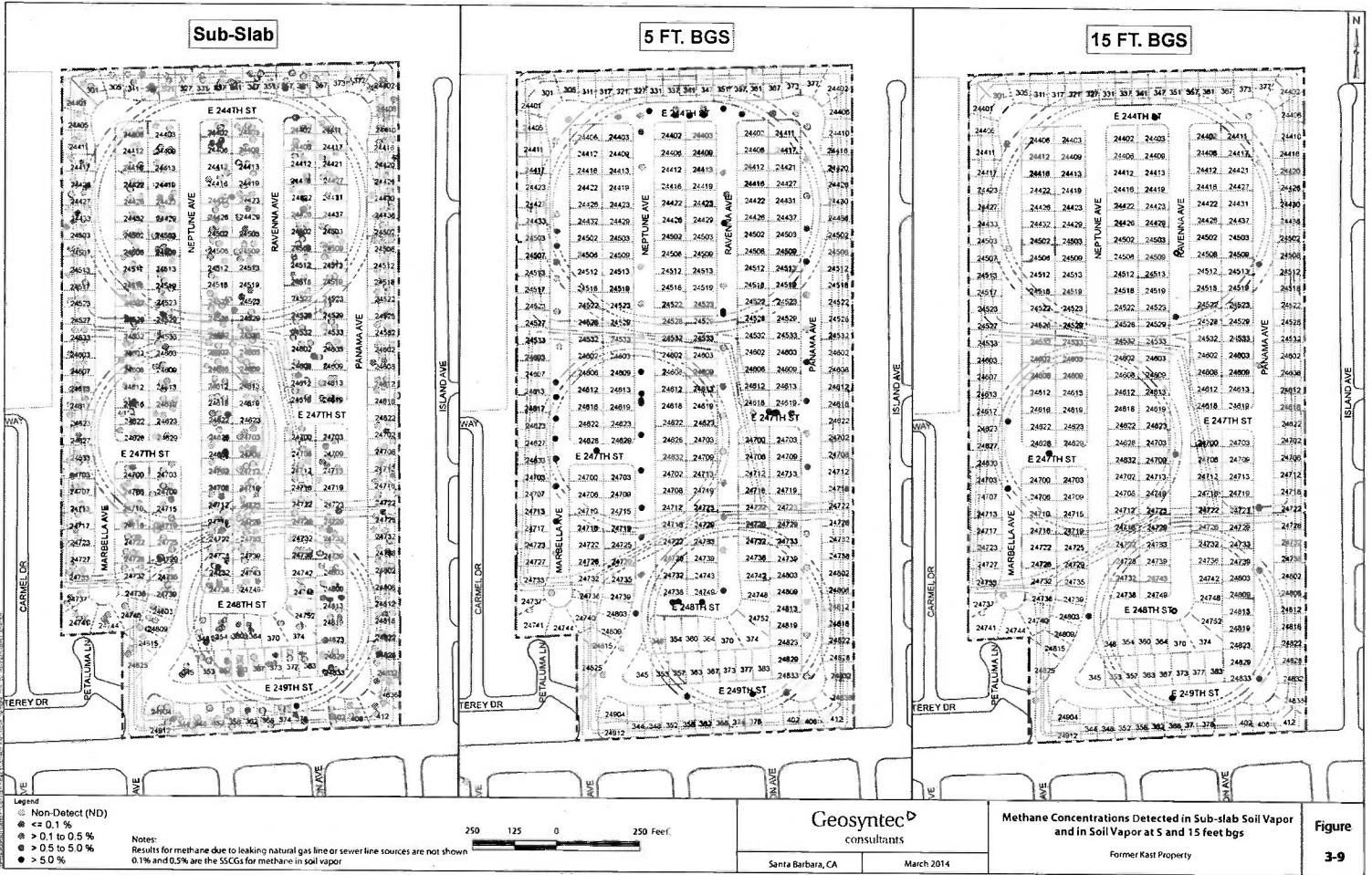
Figure

3-6









Legend  
 ○ Non-Detect (ND)  
 ●  $\leq 0.1\%$   
 ◌  $> 0.1$  to  $0.5\%$   
 ◍  $> 0.5$  to  $5.0\%$   
 ◎  $> 5.0\%$

Notes:  
 Results for methane due to leaking natural gas line or sewer line sources are not shown  
 0.1% and 0.5% are the SSCGs for methane in soil vapor

250 125 0 250 Feet

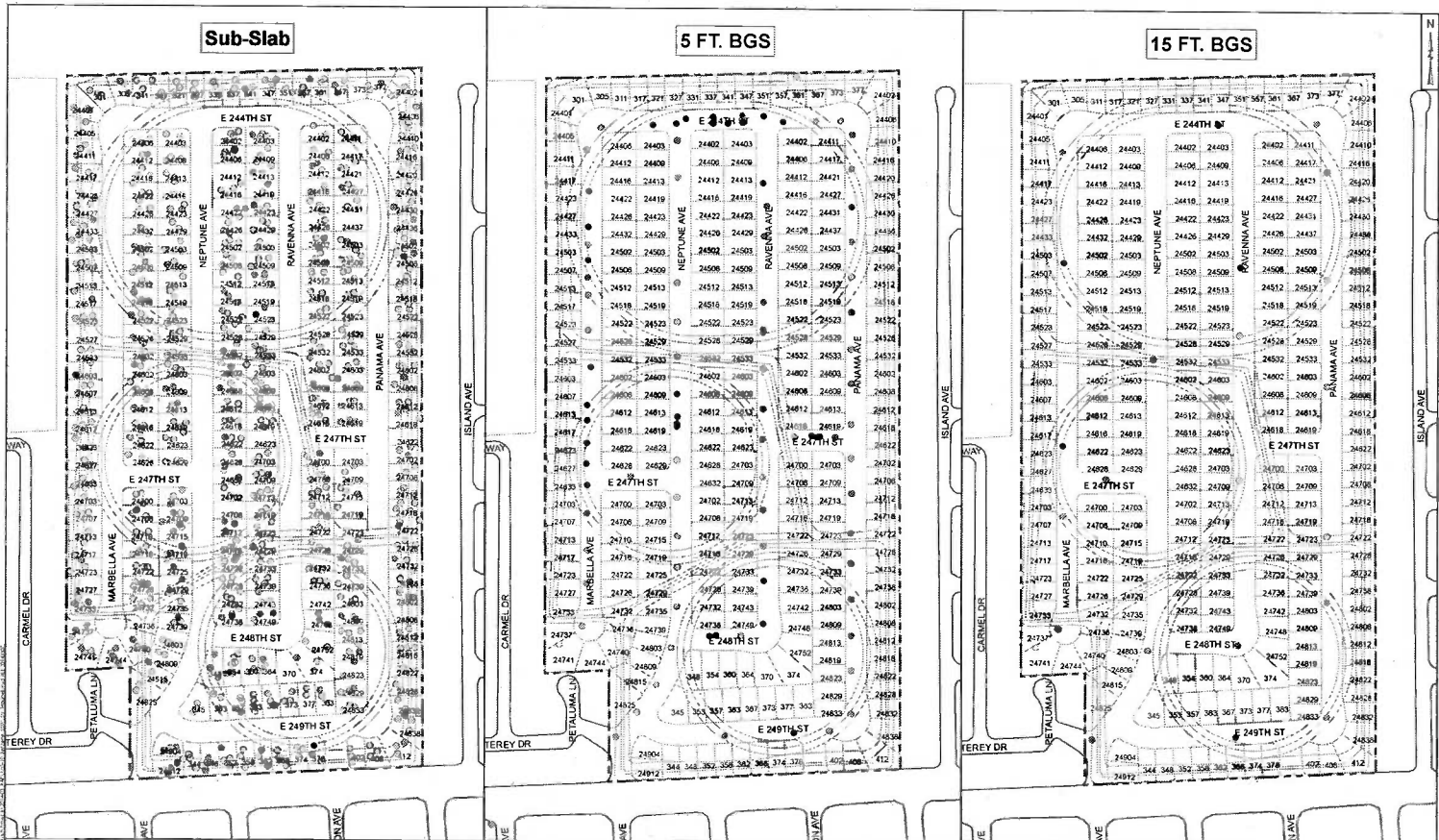
Geosyntec  
 consultants

Santa Barbara, CA March 2014

Methane Concentrations Detected in Sub-slab Soil Vapor  
 and in Soil Vapor at 5 and 15 feet bgs

Former Kati Property

Figure  
 3-9

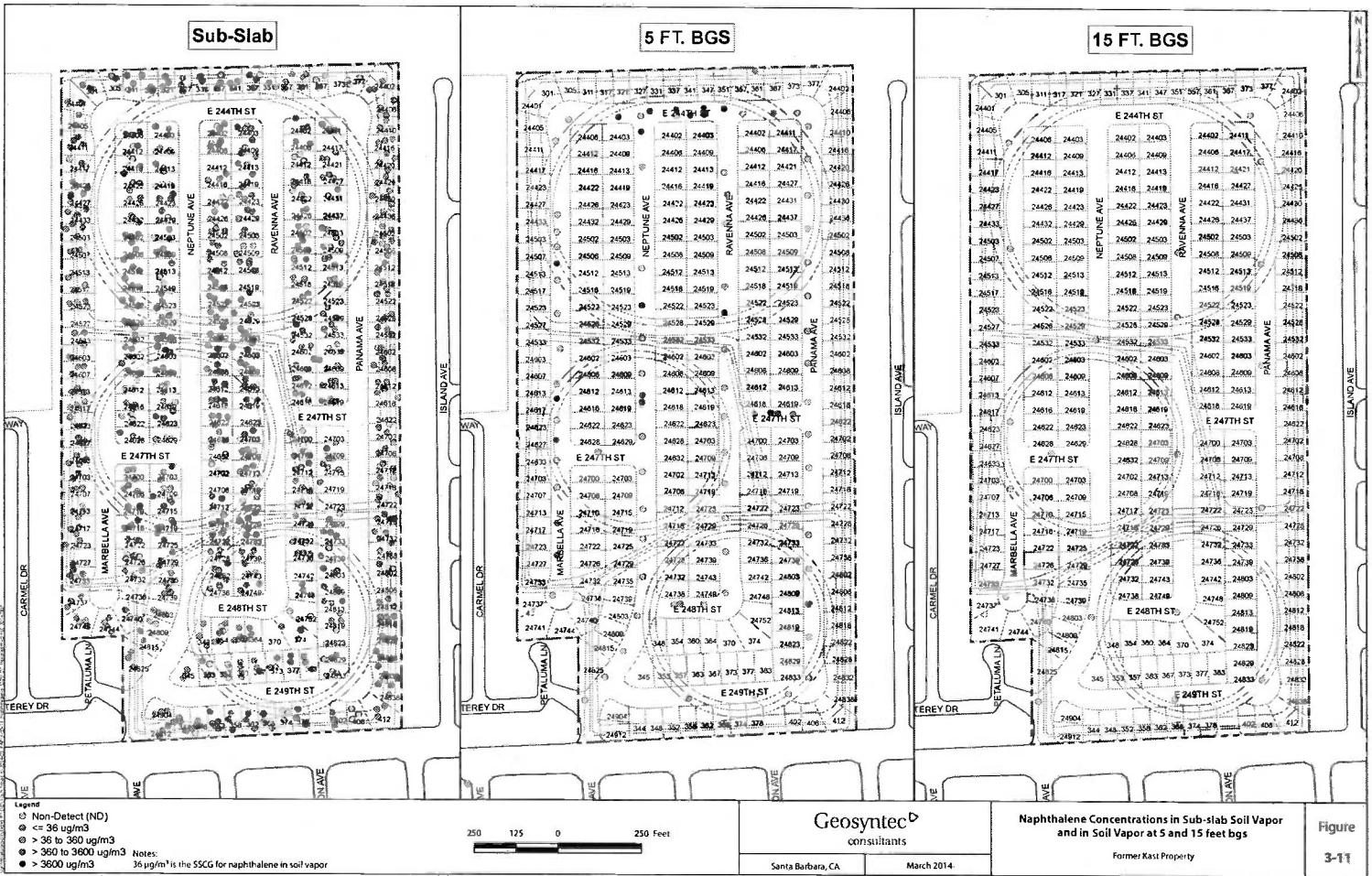


Legend  
 ○ Non-Detect (ND)  
 ● < 42 ug/m<sup>3</sup>  
 ● > 42 to 4200 ug/m<sup>3</sup>  
 ● > 420 to 4200 ug/m<sup>3</sup>  
 ● > 4200 ug/m<sup>3</sup>

Notes:  
 42 ug/m<sup>3</sup> is the SSCG for benzene in soil vapor



<b>Geosyntec</b> consultants Santa Barbara, CA      March 2014		<b>Benzene Concentrations in Sub-slab Soil Vapor          and in Soil Vapor at 5 and 15 feet bgs</b> Former Kast Property	<b>Figure</b> <b>3-10</b>
----------------------------------------------------------------------	--	----------------------------------------------------------------------------------------------------------------------------------	------------------------------



Legend

- Non-Detect (ND)
- ◌  $< 36 \text{ ug/m}^3$
- ◌  $> 36 \text{ to } 3600 \text{ ug/m}^3$
- ◌  $> 360 \text{ to } 3600 \text{ ug/m}^3$
- $> 3600 \text{ ug/m}^3$

Notes:

- 36  $\mu\text{g}/\text{m}^3$  is the SSCG for naphthalene in soil vapor

250 125 0 250 Feet

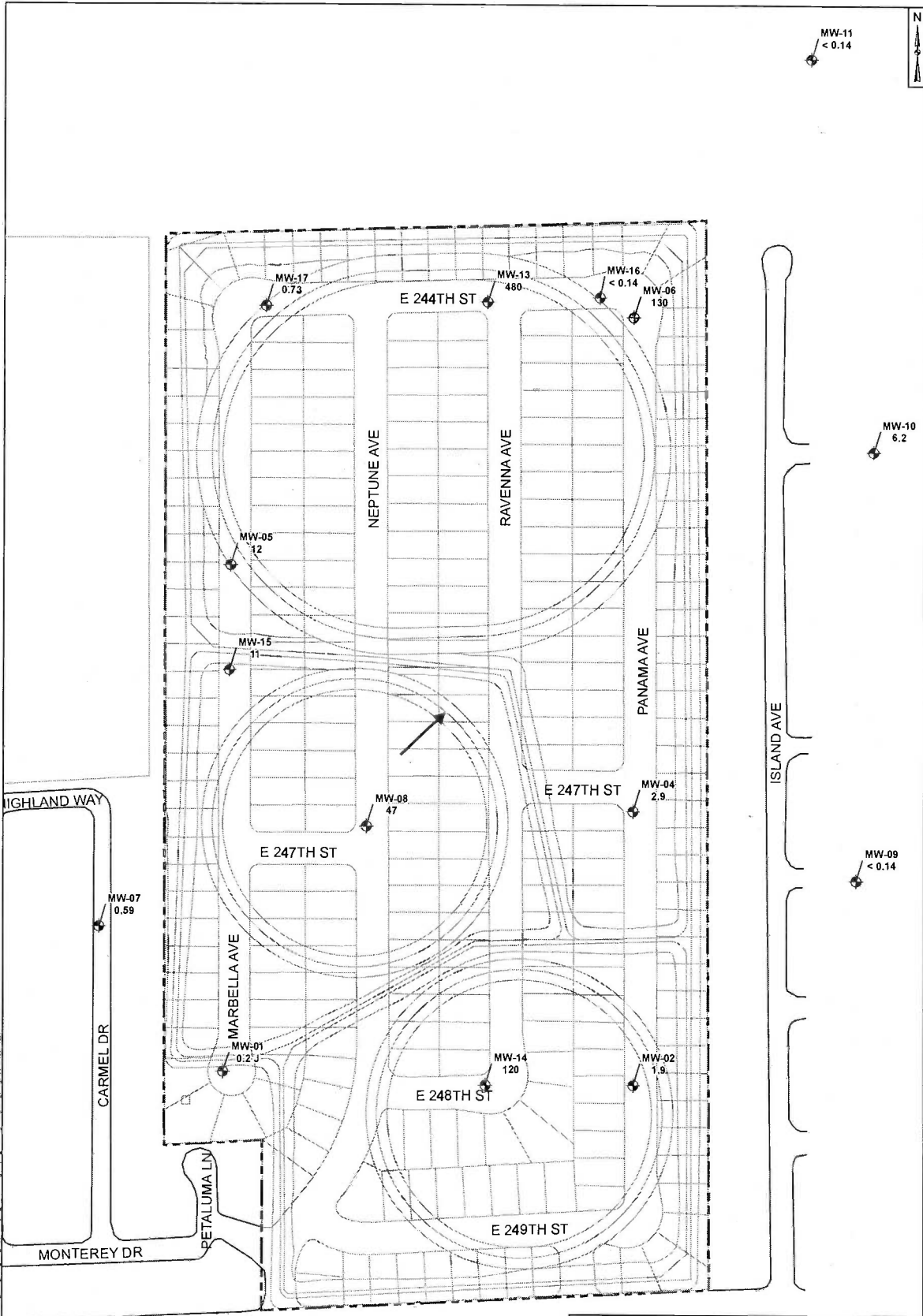
Geosyntec<sup>®</sup>  
consultants

Santa Barbara, CA March 2014

Naphthalene Concentrations in Sub-slab Soil Vapor  
and in Soil Vapor at 5 and 15 feet bgs

Former Kati Property

Figure  
3-11



**Legend**

- ◆ Monitoring Well
- Approximate Groundwater Flow Direction
- - - Site Boundary

MW-08 Monitoring well designation  
33 Benzene concentration in micrograms per liter (µg/l) collected in October 2013

< : Less than detection limit  
J : Estimated value

175 87.5 0 175 Feet

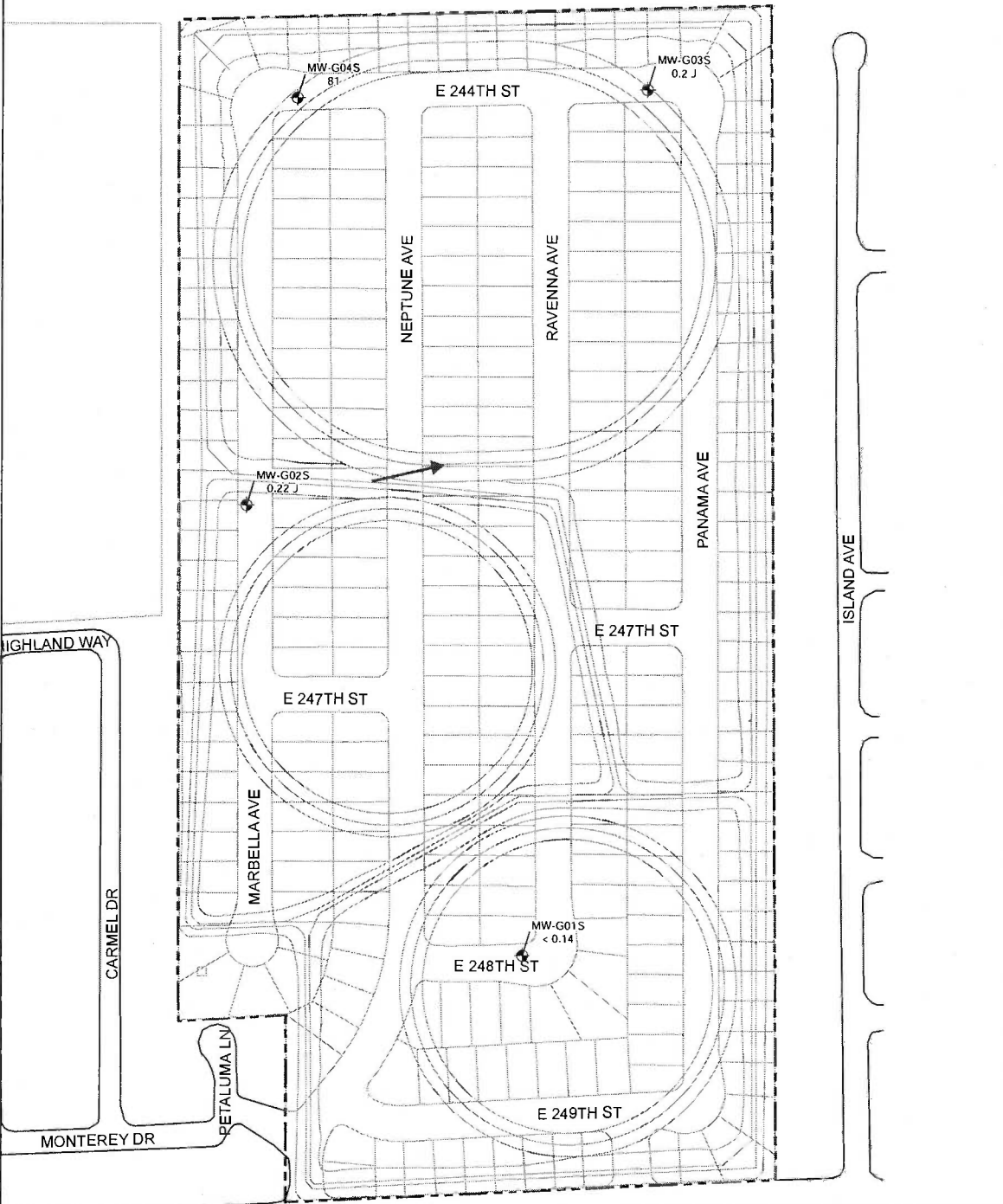
**Benzene Concentrations in Groundwater - 4Q 2013**  
Shallow Zone Wells

Former Kast Property

**Geosyntec**  
consultants

Santa Barbara February 2014

Figure  
**3-12**



P:\Projects\2013\4Q13\4Q13\_Benzene\GIS\4Q13\_Benzene\GIS\4Q13\_Benzene\_Site\_Map\_Corrections.dwg  
 Author: [unreadable]  
 Date: 10/15/13  
 Project: 4Q13\_Benzene

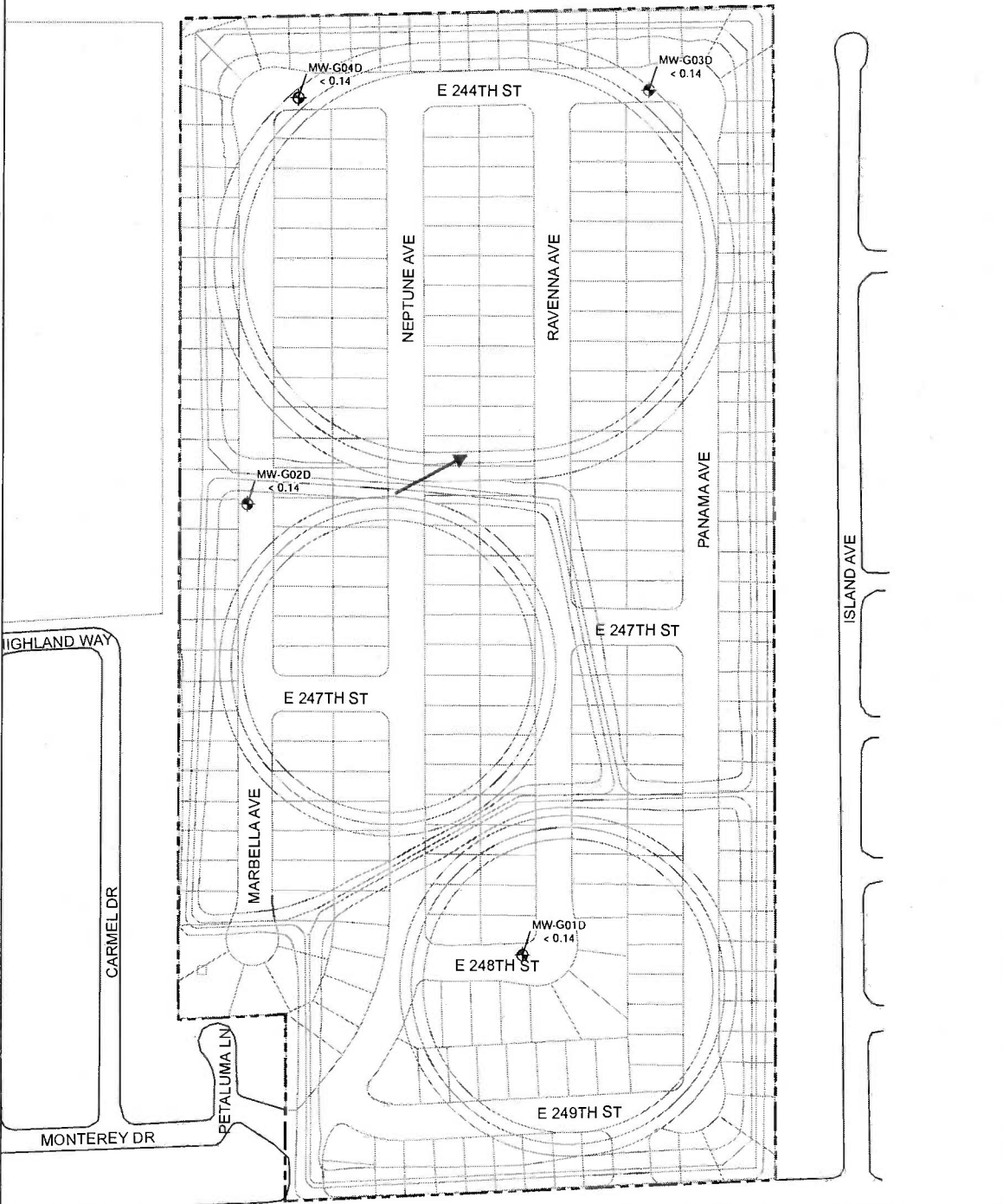
**Legend**

- Monitoring Well
- Approximate Groundwater Flow Direction
- Site Boundary

MW-G02S Monitoring well designation  
 0.19 Benzene concentration in micrograms per liter (µg/l) collected in October 2013

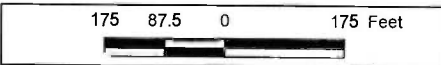
< : Less than detection limit  
 J : Estimated value

175    87.5    0    175 Feet 	
Benzene Concentrations in Groundwater - 4Q 2013 Shallow Gage Aquifer Former Kast Property	
<b>Geosyntec</b> consultants	
Santa Barbara	February 2014
<b>Figure</b> 3-13	



**Legend**

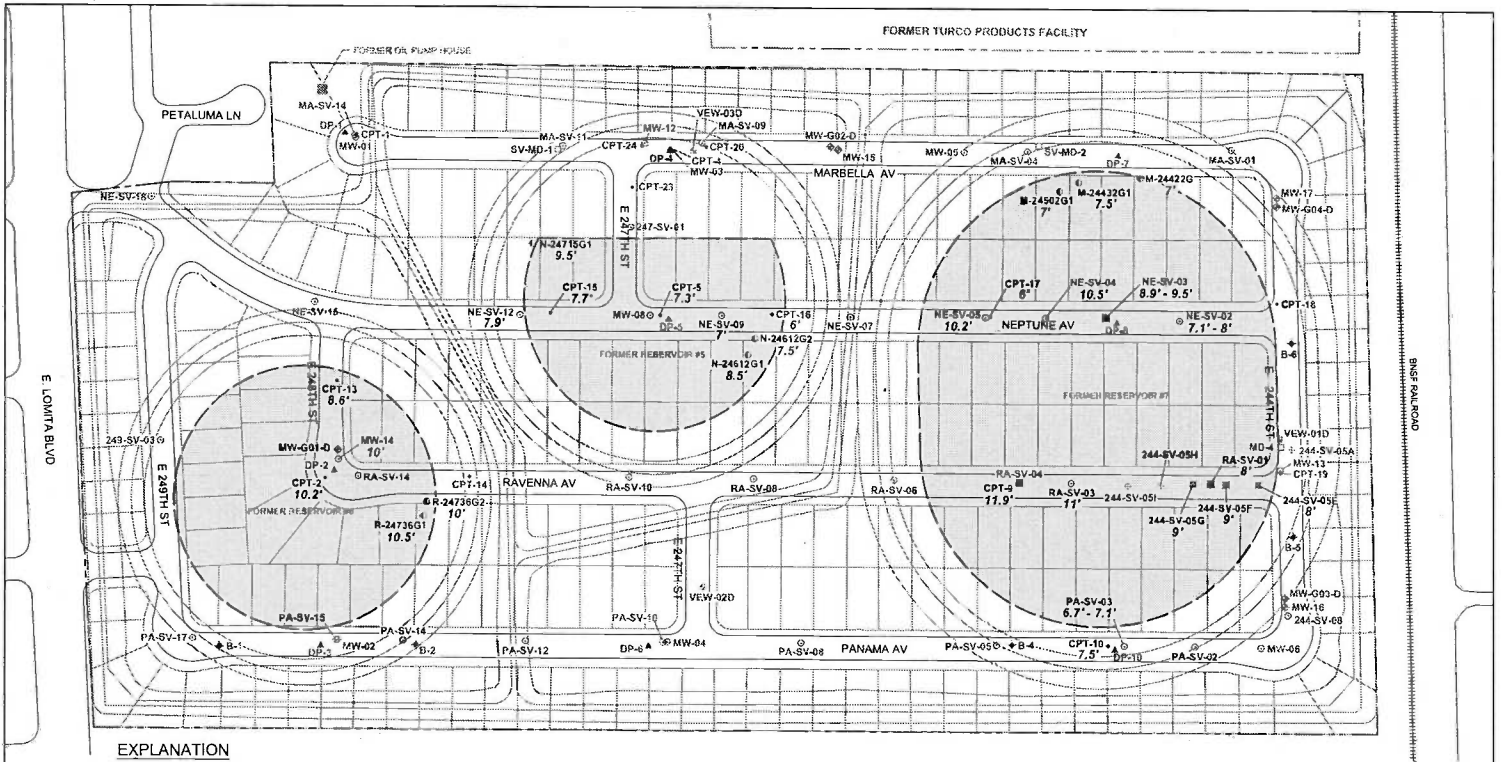
- ➔ Approximate Groundwater Flow Direction
- - - Site Boundary
- MW-G03D Monitoring well designation
- <0.14 Benzene concentration in micrograms per liter (µg/l) collected in October 2013
- < : Less than detection limit
- J : Estimated value



Benzene Concentrations in Groundwater - 4Q 2013  
 Deep Gage Aquifer  
 Former Kast Property

<b>Geosyntec</b> consultants		<b>Figure</b>  3-14
Santa Barbara	February 2014	





**EXPLANATION**

- ◆ LOCATION OF GROUNDWATER MONITORING WELL
- LOCATION OF CPT/UVOST SOUNDING
- ⊕ LOCATION OF 10-FT BGS SOIL VAPOR PROBE
- ⊙ LOCATION OF 15-FT AND 20-FT BGS SOIL VAPOR PROBE
- ▲ LOCATION OF DIRECT-PUSH BORING
- ▣ LOCATION OF MULTI-DEPTH SOIL VAPOR PROBE
- ⊖ APPROXIMATE LOCATION OF PILOT TEST GEOTECHNICAL BORING
- ⊛ LOCATION OF SVE EXTRACTION WELL
- ADVANCED TO ≥10' BGS WITHOUT REFUSAL NOTED ON BORING LOGS OR IN FIELD NOTES
- REFUSAL AT ≥10' BGS NOTED ON BORING LOGS OR IN FIELD NOTES WITH DEPTH OF REFUSAL NOTED
- APPROXIMATE PROPERTY LINE
- ESTIMATED EXTENT OF RESIDUAL CONCRETE RESERVOIR SLABS

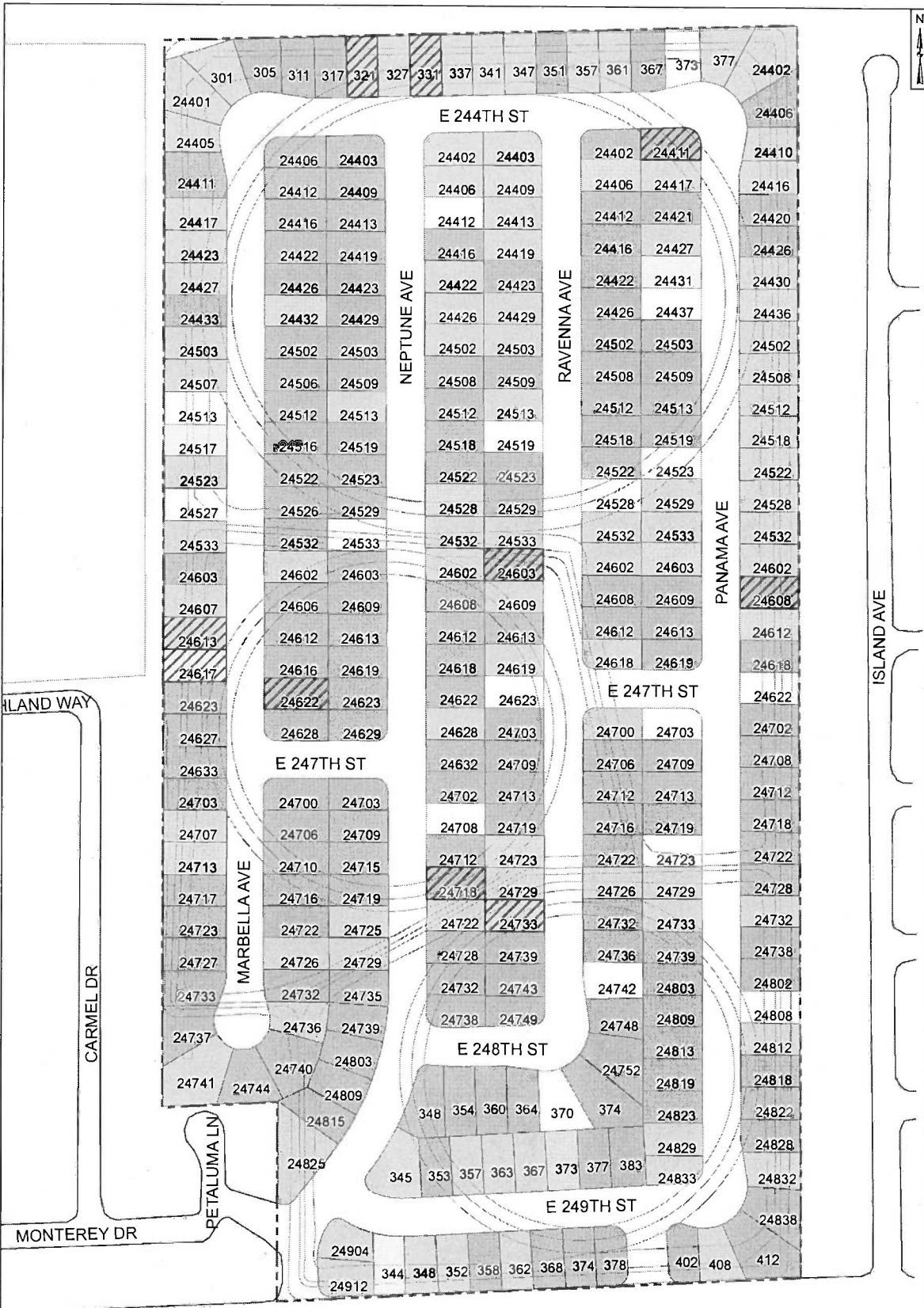


**URS**

ESTIMATED EXTENT OF RESIDUAL CONCRETE RESERVOIR SLABS SHOWING BORING REFUSAL IN SOIL BORINGS, MONITORING WELLS AND SOIL VAPOR PROBES INSTALLED IN STREETS

Proj. No.: 45194119	Date: MARCH 2014
Project: FORMER KAST PROPERTY	Page: 3-15

©2014 Shell Products - Former Kast Property CADD/Boring Refusal/Quant 3-15 [a]BoreCirc[.dgn] 58 1/4" SWP W Sws.dwg : File size: 33/02/14 4:37 PM, Plot date: 3/3/2014 1:26 PM by: hggw, Gaudin



K:\Projects\2012\12-05\_HHRA\12-05\_HHRA\_Soil\_Leach\_4x6\_inches\Map\_Series000

**Legend**

- HHRA or Soil Leaching to GW Criteria
- > Soil Leaching to GW Criteria
- > HHRA Criteria
- > HHRA and Soil Leaching to GW Criteria
- No Data Available
- Antimony, Arsenic, or Thallium > Background

**Notes:**  
ft bgs = feet below ground surface

150    75    0    150 Feet

**Properties Exceeding Human Health and/or  
Leaching to Groundwater Criteria,  
≤ 5 Feet Below Ground Surface**  
 Former Kast Property

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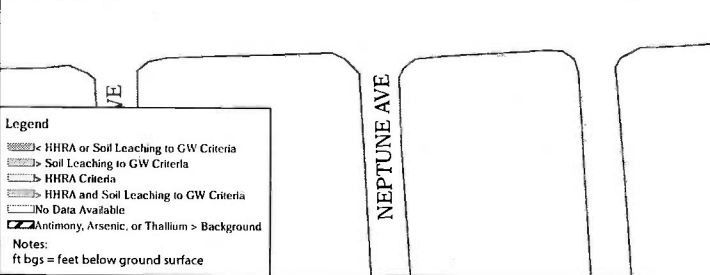
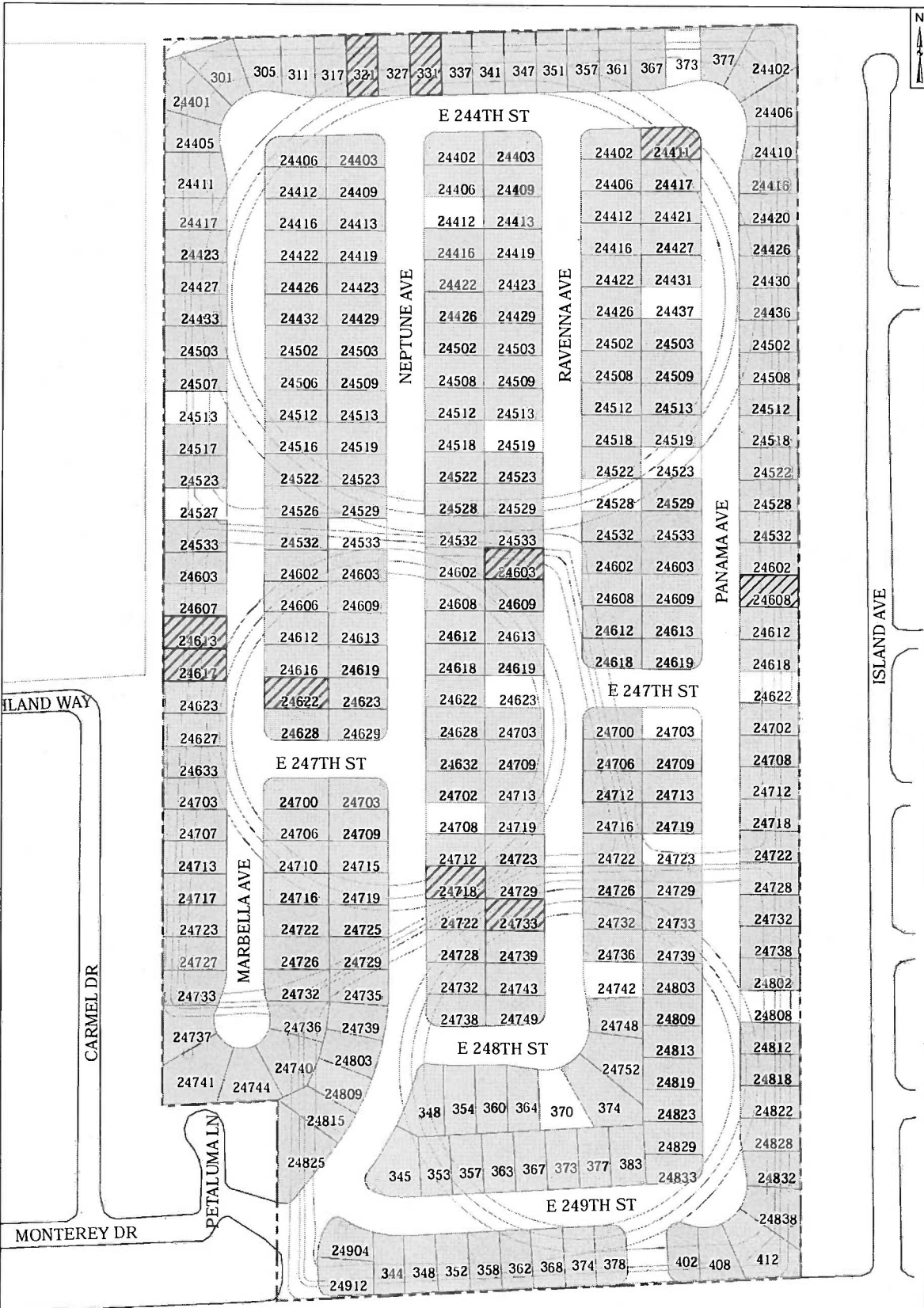
Figure

**6-1**

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Santa Barbara

March 2014



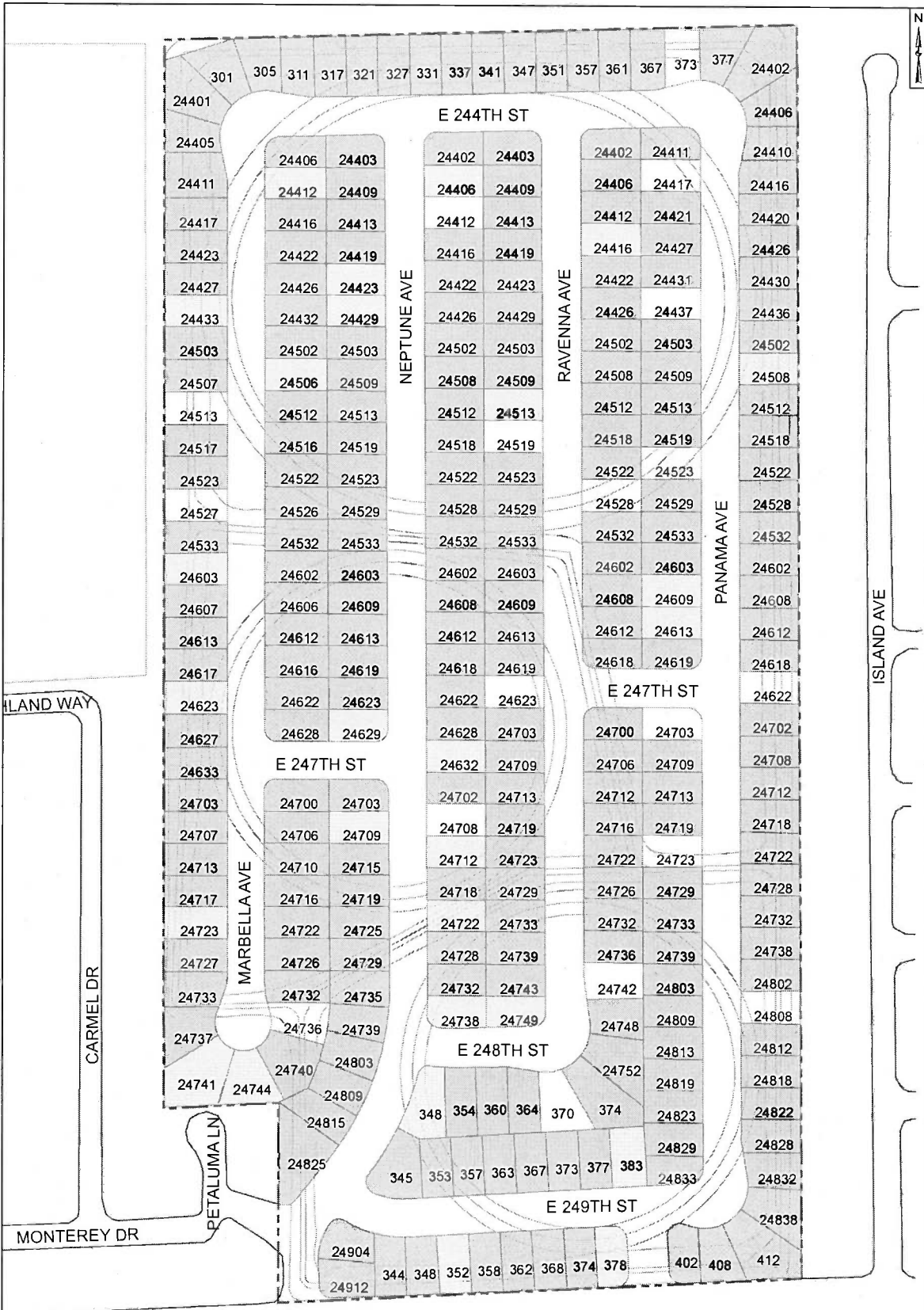
150 75 0 150 Feet

Properties Exceeding Human Health and/or Leaching to Groundwater Criteria, > 5 Feet and ≤ 10 Feet Below Ground Surface  
Former Kast Property

**Geosyntec**  
consultants

Santa Barbara March 2014

Figure 6-2



Legend

- < HHRA Criteria
- > HHRA Criteria
- No Data Available

Notes:

- Background Risks Associated with Trihalomethanes not Included
- 24632 Neptune Avenue property identified for sub-slab mitigation based on methane detection at 0.58%, slightly above the methane Site-Specific Cleanup Goal (SSCG) of 0.5%

150 75 0 150 Feet

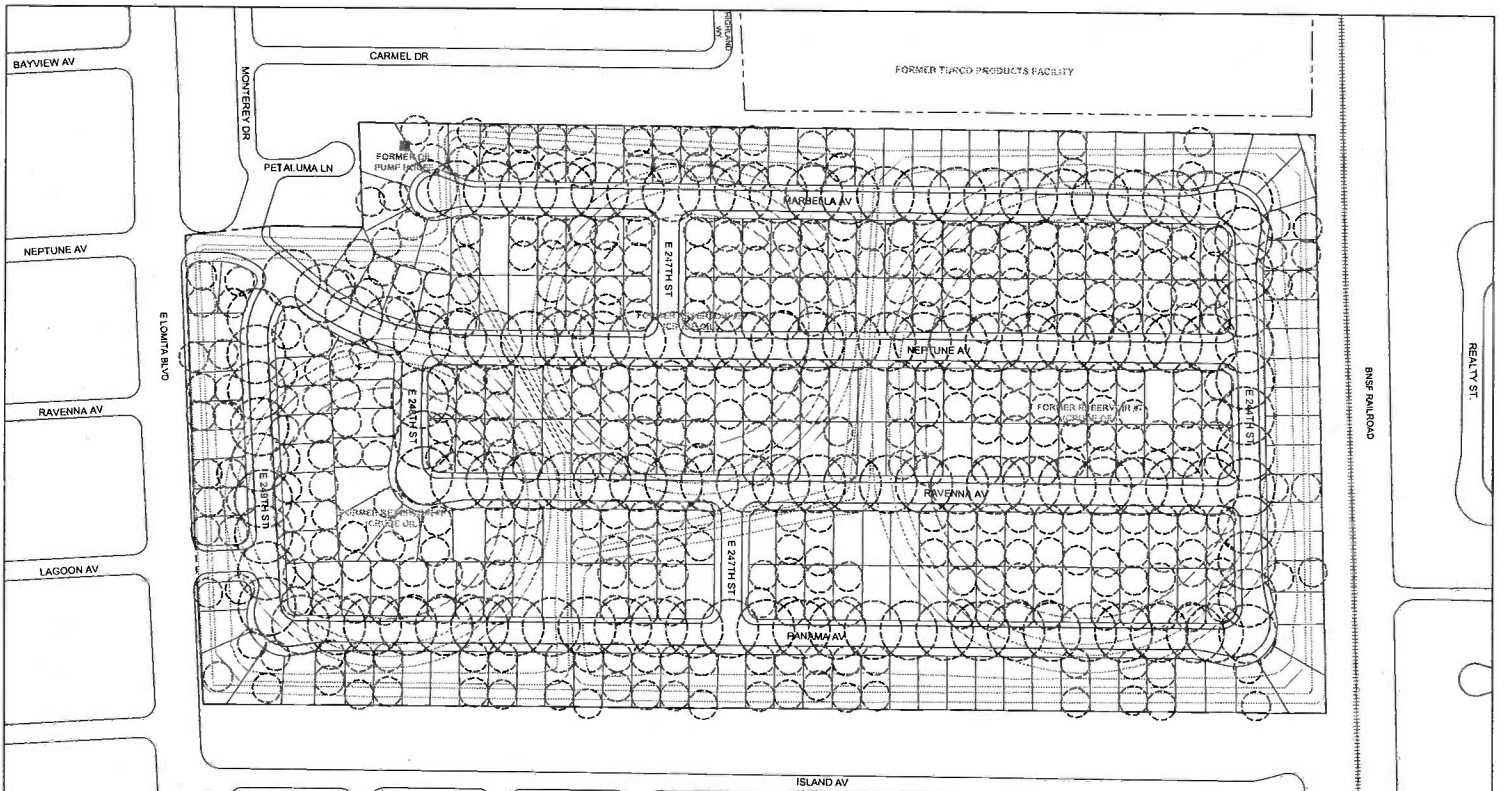
**Properties Exceeding Human Health Criteria for Sub-Slab Soil Vapor to Indoor Air**

Former Kast Property

**Geosyntec**<sup>®</sup>  
consultants

Santa Barbara March 2014

**Figure 6-3**



**EXPLANATION**

- APPROXIMATE PROPERTY LINE
- CONCEPTUAL STREET EXTRACTION WELL RADIUS OF VACUUM INFLUENCE (50 FEET)  
124 SHALLOW WELLS AT APPROXIMATELY 62.5-FOOT SPACING
- CONCEPTUAL RESIDENTIAL EXTRACTION WELL RADIUS OF VACUUM INFLUENCE (25 FEET)  
420 SHALLOW WELLS AT 210 RESIDENCES

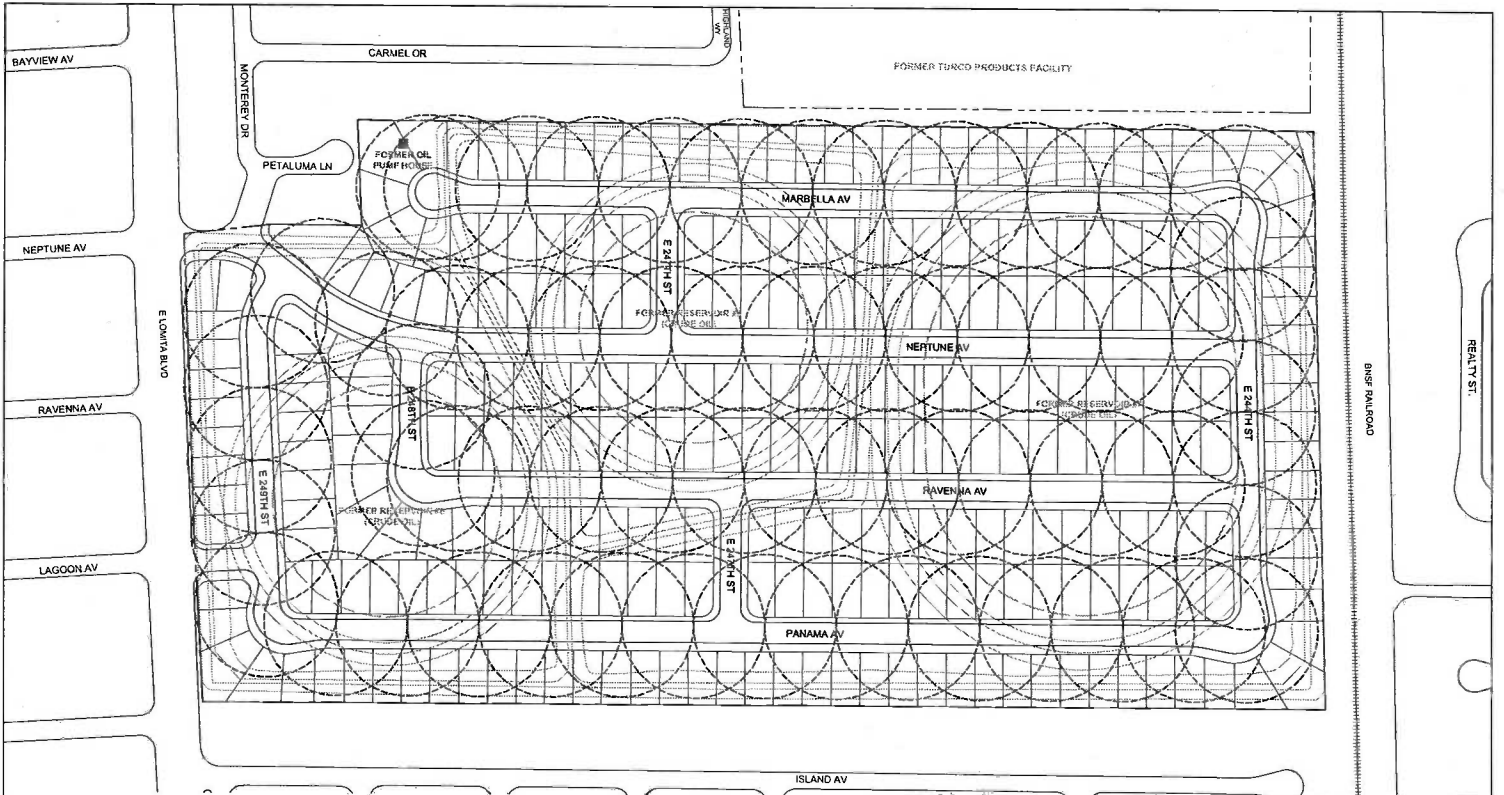


**URS**

**CONCEPTUAL VAPOR EXTRACTION  
COVERAGE FOR THE  
SHALLOW ZONE**

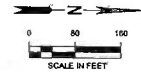
Proj. No.: 49104119	Date: MARCH 2014
Project: FORMER KAST PROPERTY	Figure: 8-1

© 2014 Shell Products - Former Kast Property/SMP/SVE Figure 8-1 Conceptual Vapor Extraction Coverage - Shallow Zone.dwg - File date: 3/5/2014 9:15 PM, Plot date: 3/10/2014 2:48 PM by: So-04-Vivian



**EXPLANATION**

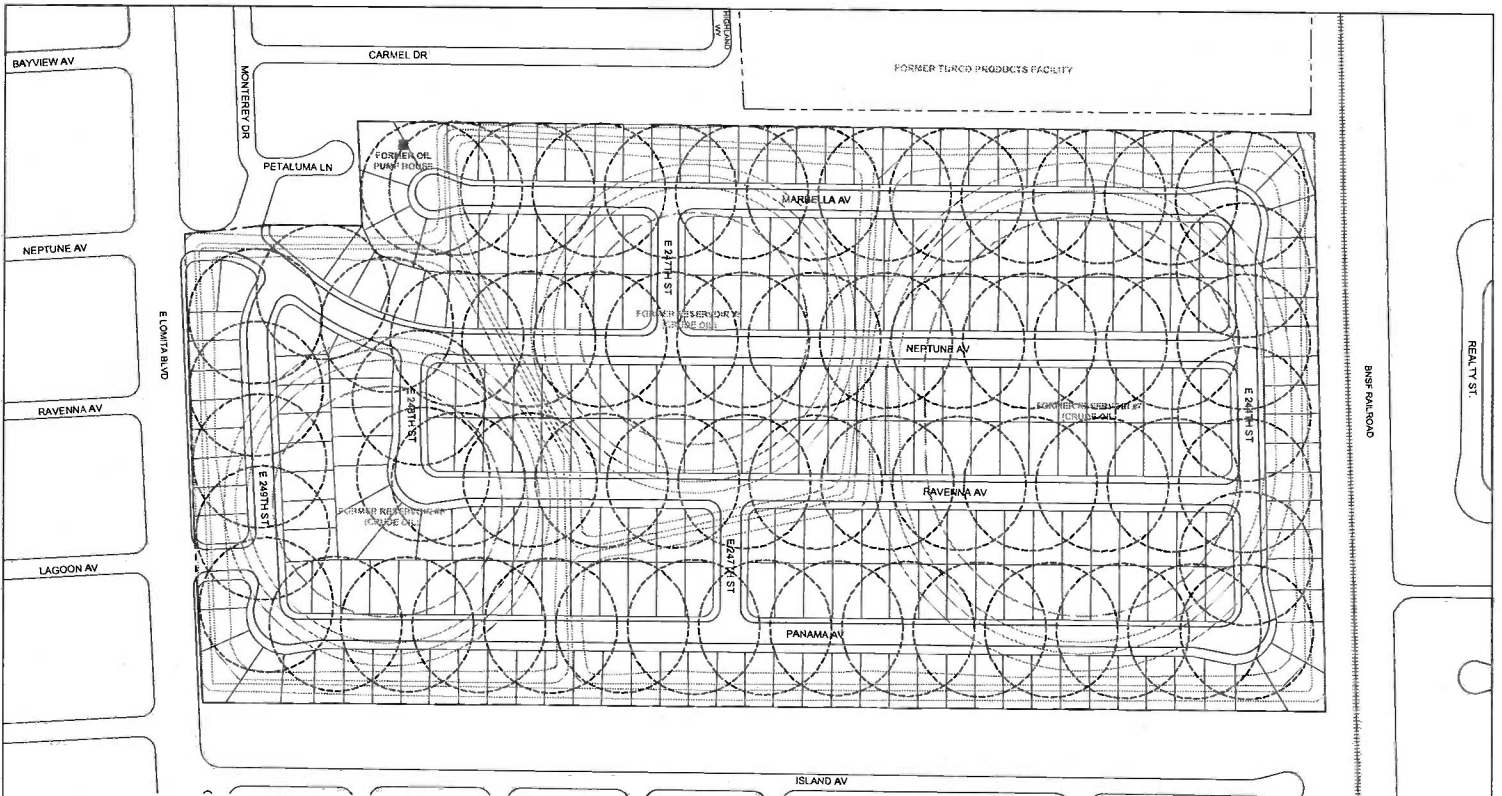
- APPROXIMATE PROPERTY LINE
- CONCEPTUAL INTERMEDIATE EXTRACTION WELL  
RADIUS OF VACUUM INFLUENCE (125 FEET)  
63 WELLS AT APPROXIMATELY 125-FOOT SPACING



**URS**

**CONCEPTUAL VAPOR EXTRACTION  
COVERAGE FOR THE  
INTERMEDIATE ZONE**

Proj. No.: 49194119	Date: MARCH 2014
Project: FORMER KAST PROPERTY	Figure: 8-2



**EXPLANATION**

- APPROXIMATE PROPERTY LINE
- CONCEPTUAL DEEP EXTRACTION WELL  
RADIUS OF VACUUM INFLUENCE (116 FEET)  
63 WELLS AT APPROXIMATELY 125-FOOT SPACING

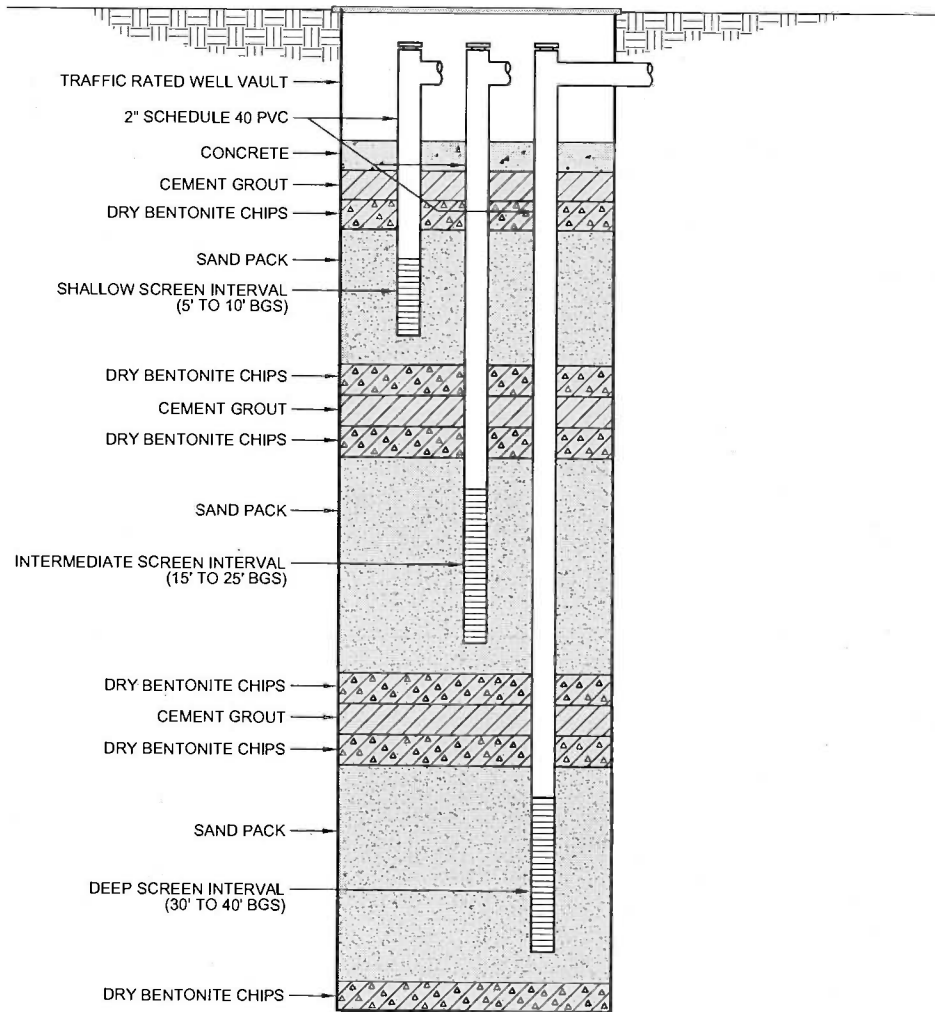


**URS**

**CONCEPTUAL VAPOR EXTRACTION  
COVERAGE FOR THE  
DEEP ZONE**

Proj. No.: 0194119	Date: MARCH 2014
Project: FORMER KAST PROPERTY	Figure: 8-3

# TRIPLE COMPLETION STREET SOIL VAPOR EXTRACTION WELL



BORING DIAMETER: 11 3/4"  
TOTAL DEPTH (APPROXIMATE): 42' BGS

**NOTES:**

BGS = BELOW GROUND SURFACE  
PVC = POLYVINYLCHLORIDE

## URS

### TYPICAL NESTED WELL CONSTRUCTION DETAIL

Proj. No.: 49194119

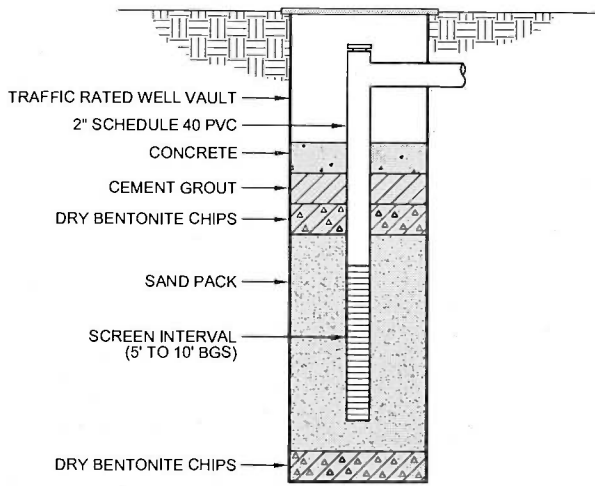
Date: MARCH 2014

Project: FORMER KAST PROPERTY

Figure: 8-4

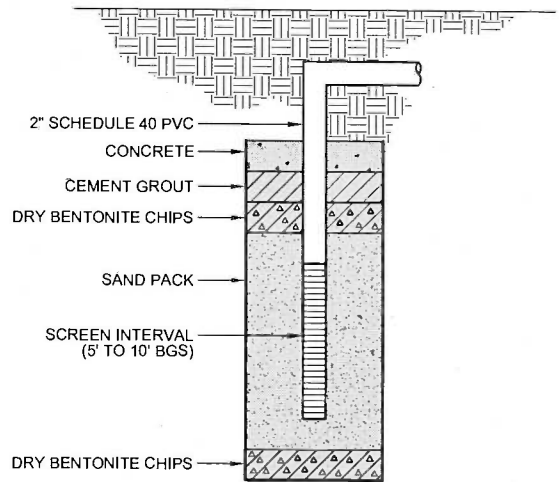


SHALLOW STREET  
SOIL VAPOR  
EXTRACTION WELL



BORING DIAMETER: 6 3/4" MINIMUM  
TOTAL DEPTH (APPROXIMATE): 12' BGS

SHALLOW RESIDENTIAL  
SOIL VAPOR  
EXTRACTION WELL



BORING DIAMETER: 6 3/4" MINIMUM  
TOTAL DEPTH (APPROXIMATE): 12' BGS

NOTES:

BGS = BELOW GROUND SURFACE  
PVC = POLYVINYLCHLORIDE

**URS**

TYPICAL SHALLOW  
WELL CONSTRUCTION  
DETAIL

Proj. No.: 49194119

Date: MARCH 2014

Project: FORMER KAST PROPERTY

Figure:

8-5

**APPENDIX A**

**CROSS-REFERENCE TABLE OF REGIONAL BOARD REQUIREMENTS ADDRESSED IN  
THE HHRA, FS, AND RAP**

## CROSS-REFERENCE TABLE OF REGIONAL BOARD REQUIREMENTS ADDRESSED IN THE HHRA, FS, AND/OR RAP

The table below presents the CAO requirements addressed in this RAP or the companion Human Health Risk Assessment (HHRA, Geosyntec, 2014a) and Feasibility Study (FS, Geosyntec, 2014b), being submitted concurrently as separate documents. The Regional Board reviewed the Revised Site-Specific Cleanup Goal (SSCG) Report (Geosyntec, 2013c), and provided comments on the report on January 23, 2014 along with additional directives for items to be included in the RAP, and these requirements are also included below. Finally, in the Regional Board's review of the *Soil Background Evaluation Report* (URS, 2010e) and the *Assessment of Environmental Impact and Feasibility of Removal of Residual Concrete Reservoir Slabs* (URS, 2013e), the Regional Board provided additional directives that are also captured below.

Specific Requirement in Section 3.c of the CAO	Where Addressed
A detailed plan for remediation of wastes in shallow soil that will incorporate the results from the soil vapor extraction (SVE) pilot test;	This requirement is incorporated in the selected remedy, evaluated in the FS (Geosyntec, 2014b), and discussed throughout this RAP.
A plan to address any impacted area beneath any existing paved areas and concrete foundations of the homes, if warranted;	This requirement is incorporated in the selected remedy, discussed throughout the FS (Geosyntec, 2014b) and this RAP. Specific discussion of how the selected remedy addresses impacted areas beneath any existing paved areas and concrete foundations of the homes, as warranted, is included in Section 8.2 of the RAP.
A detailed surface containment and soil management plan;	The Surface Containment and Soil Management Plan is included as Appendix D to the RAP.
An evaluation of all available options including proposed selected methods for remediation of shallow soil and soil vapor;	This evaluation was performed in the Feasibility Study (Geosyntec, 2014b).
Continuation of interim measures for mitigation according to the Regional Board approved Interim Remediation Action Plan; and	This requirement is discussed in Section 4.1 of this RAP.
A schedule of actions to implement the RAP.	This requirement is incorporated in Section 9.5 of this RAP.

<p align="center"><b>Specific Requirement of the Regional Board's January 23, 2014 Letter</b></p>	<p align="center"><b>Where Addressed</b></p>
<p>Remedial Alternatives: The RAP shall consider all technologies that were pilot tested, including bioventing, as alternatives. The RAP shall be developed to address COCs in soils in the soil intervals consistent with these comments. The screening FS alternatives in the Revised Report that address this requirement include Alternatives 3B and 4B. Although other alternatives set forth in the screening FS may also be addressed in the RAP, the RAP and environmental analysis must address Alternatives 3B or 4B to take into account the revised SSCGs set forth in Tables I, 2, and 3. Consistent with State Water Board Resolution 92-49, the RAP shall evaluate the alternatives with respect to effectiveness, feasibility, and cost and propose a remedy or remedies that have a substantial likelihood to achieve compliance, within a reasonable time frame, with the cleanup goals and objectives.</p>	<p>This evaluation was performed in the Feasibility Study (Geosyntec, 2014b).</p>
<p>Relocation Plan: The RAP shall provide a preliminary relocation plan for residents of the Carousel Tract during remedial activities. The relocation plan shall be based on the environmental analysis to be submitted in the RAP such that residents are not exposed to COCs or other environmental impacts during the cleanup. A final relocation plan shall be submitted following approval of the RAP.</p>	<p>The Preliminary Relocation Plan is included as Appendix E to this RAP.</p>
<p>Soil Remediation Boundaries: Shell developed site-wide shallow soil concentration contours for discrete depths of 2, 5, and 10 feet below ground surface in the Site Delineation Report. Shell shall consider the results in the Site Delineation Report, soil concentrations contours and the results of the property-by-property investigations in developing the RAP.</p>	<p>These maps were originally submitted on April 29, 2011 on behalf of SOPUS in response to comments received from the Regional Board in the approval letter for the Step-out Sampling Work Plan for Plume Delineation dated February 17, 2011. Revised contour plots of analytes in soil that include soil data through January 30, 2014 are included in Appendix B to this RAP. Section 8.2.3 of this RAP discusses how Shell intends to consider these contours in the remedial strategy.</p>

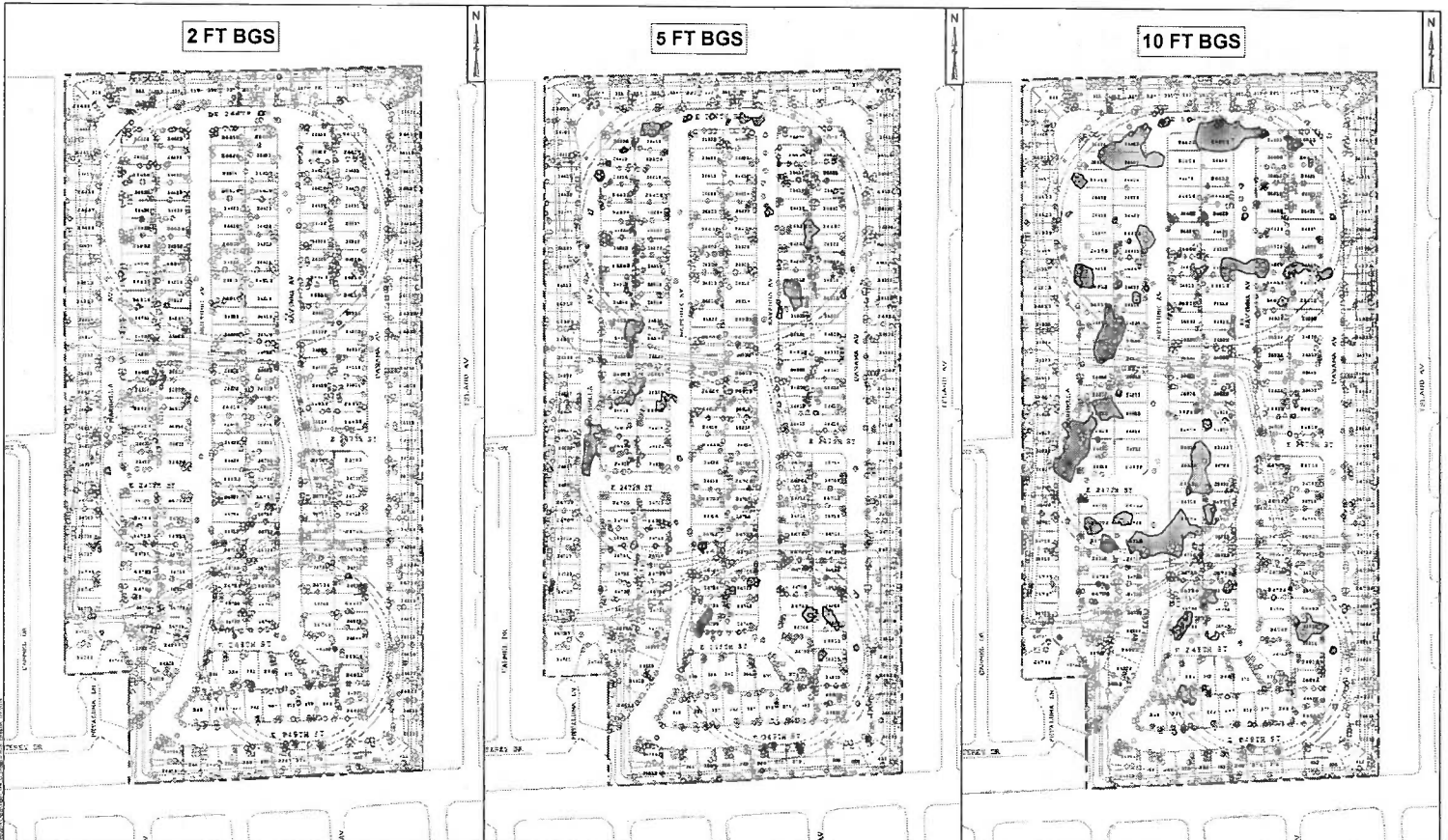
<b>Specific Requirement of the Regional Board's January 23, 2014 Letter</b>	<b>Where Addressed</b>
Residual Slabs: The RAP shall consider the removal of residual slabs as discussed in the Regional Board's response to the Assessment of Environmental Impact and Feasibility of Removal of Residual Concrete Reservoir Slabs in a letter dated, January 13, 2014 where necessary to protect human health and water quality and address nuisance concerns.	This requirement was revised in the Regional Board's letter dated February 10, 2014, and is discussed in Section 8 of the RAP.
Soil Management Plan: The RAP shall include a proposed Soil Management Plan for all soils containing COCs. The RAP shall address on-going monitoring requirements and identification of other governmental agencies that may be responsible for implementing the Soil Management Plan.	The Surface Containment and Soil Management Plan is included as Appendix D to this RAP.
<b>Other Directives Included in the Regional Board's January 23, 2014 Letter</b>	<b>Where Addressed</b>
Shell shall develop the RAP, the final Human Health Risk Assessment (HHRA) Report, and the environmental analysis using the SSCGs in Tables 1, 2 and 3.	This requirement is addressed by the HHRA (Geosyntec, 2014a) and this RAP. Shell is separately providing a CEQA Notice of Preparation (NOP) and Initial Study (IS) for the project, and these draft documents are also included in Appendix G to this RAP.
To assure protection of residents, the RAP will need to include a method to determine if TPH concentration in soil presents a detectable odor in accordance with the ESL and develop odor-based screening levels of indoor air based on 50 percent odor-recognition thresholds as published in the ATSDR Toxicological Profiles. For soil gas, follow the ESL for odor and other nuisance to calculate a ceiling level for residential land use.	This requirement is addressed in Section 5.5 of the HHRA (Geosyntec, 2014a) and Section 5.2.2 of this RAP. Odor monitoring and control during excavation is discussed in Section 8.1.3 of this RAP, in the Surface Containment and Soil Management Plan (Appendix D), and will be further addressed in the RDIP, as discussed in section 9.2 of this RAP.
The more stringent of the SSCGs for each soil interval are the approved SSCGs. In addition, SSCGs for toluene and xylenes shall be developed in accordance with the comments above and added to the list of COCs.	This requirement is addressed in the HHRA (Geosyntec, 2014a).
In addition, the SSCGs shall be revised if necessary to take into account cumulative risks and the final HHRA Report.	This requirement is addressed in the HHRA (Geosyntec, 2014a).

Other Directives Included in the Regional Board's January 23, 2014 Letter	Where Addressed
<p>Shell is directed to concurrently submit with the RAP (1) the final HHRA Report and (2) draft environmental documents consistent with the California Environmental Quality Act (CEQA) analyzing the potential environmental impacts associated with remediation alternatives considered in the RAP.</p>	<p>The HHRA (Geosyntec, 2014a) and FS (Geosyntec, 2014b) are being submitted concurrently with this RAP as separate documents. Shell is separately providing a CEQA Notice of Preparation (NOP) and Initial Study (IS) for the project and these draft documents are also included in Appendix G to this RAP.</p>
<p>The RAP shall address any areas that the HHRA Report identifies that will not meet the remedial action objectives (RAOs) of a cancer risk of <math>1 \times 10^{-6}</math> and non-cancer risk of 1. The RAP shall ensure that these areas be remediated to meet the RAOs.</p>	<p>This requirement is discussed in Section 8 of this RAP. Site soils that do not meet RAOs remaining beneath excavated areas and beneath City streets and sidewalks and residential homes will be addressed by operation of the SVE/bioventing system.</p>
<p>The RAP should address the comments by the Expert Panel that are not already addressed in this letter.</p>	<p>This requirement is addressed in the HHRA (Geosyntec, 2014a) and the Feasibility Study (Geosyntec, 2014b), as well as in this RAP.</p>
Other Directives Addressed in the HHRA, FS, and/or RAP	Where Addressed
<p>Source: Regional Board's letter dated September 13, 2013 regarding the <i>Soil Background Evaluation Report</i>.</p> <p>You are required to address OEHHA's comments and submit a revised Soil Background Evaluation Report to Regional Board prior to or concurrent with the submittal of the Human Health Risk Assessment (HHRA).</p> <p>You are required to integrate the parcel-by-parcel risk assessment based on background metal and polycyclic aromatic hydrocarbons (PAHs) concentrations into a site-wide HHRA. The HHRA is due prior or concurrent with the submittal of the Remedial Action Plan.</p>	<p>This directive is addressed by the Soil Background Analysis included as Appendix A to the HHRA (Geosyntec, 2014a). The HHRA addresses background metals and PAHs.</p> <p>The HHRA includes a parcel-by-parcel risk assessment as directed.</p> <p>The HHRA is being submitted concurrently with the RAP.</p>

Other Directives Addressed in the HHRA, FS, and/or RAP	Where Addressed
<p>Source: Regional Board's letter dated February 10, 2014, providing clarification and revision of the Regional Board's January 13, 2014 review of the <i>Assessment of Environmental Impact and Feasibility of Removal of Residual Concrete Reservoir Slabs</i>.</p> <p>Residual Slabs: The RAP shall consider remedial options to address long term health risks, water quality, and nuisance concerns consistent with the Regional Board's response to Assessment of Environmental Impact and Feasibility of Removal of Residual Concrete Reservoir Slabs in a letter dated January 13, 2014, as revised and clarified in the Regional Board's letter dated February 10, 2014.</p> <p>Shell shall identify in the RAP: Remedial options to address long term health risks, water quality, and nuisance concerns caused by constituents of concerns [sic] associated with residual concrete slabs that will meet the approved site-specific cleanup goals consistent with State Water Resources Control Board Resolution 92-49.</p>	<p>The approach to residual concrete reservoir slabs is discussed in Section 8 of the RAP. Residual slabs will be removed from excavations, if encountered, to the lateral limits of excavated areas. Any residual COCs associated with the slabs will be addressed via operation of the SVE/bioventing system. This approach addresses any long-term health risks, water quality, and nuisance concerns caused that may be associated with the residual concrete slabs, meets the site-specific cleanup goals, and is consistent with State Water Resources Control Board Resolution 92-49.</p>

**APPENDIX B**  
**CONTOUR PLOTS OF ANALYTES IN SOIL**





**TPH as Gasoline**

- Non-Detect (ND)
- < 500 mg/kg
- ≥ 500 to 5,000 mg/kg
- ≥ 5,000 mg/kg

**Contour**

- 500 mg/kg
- 5,000 mg/kg

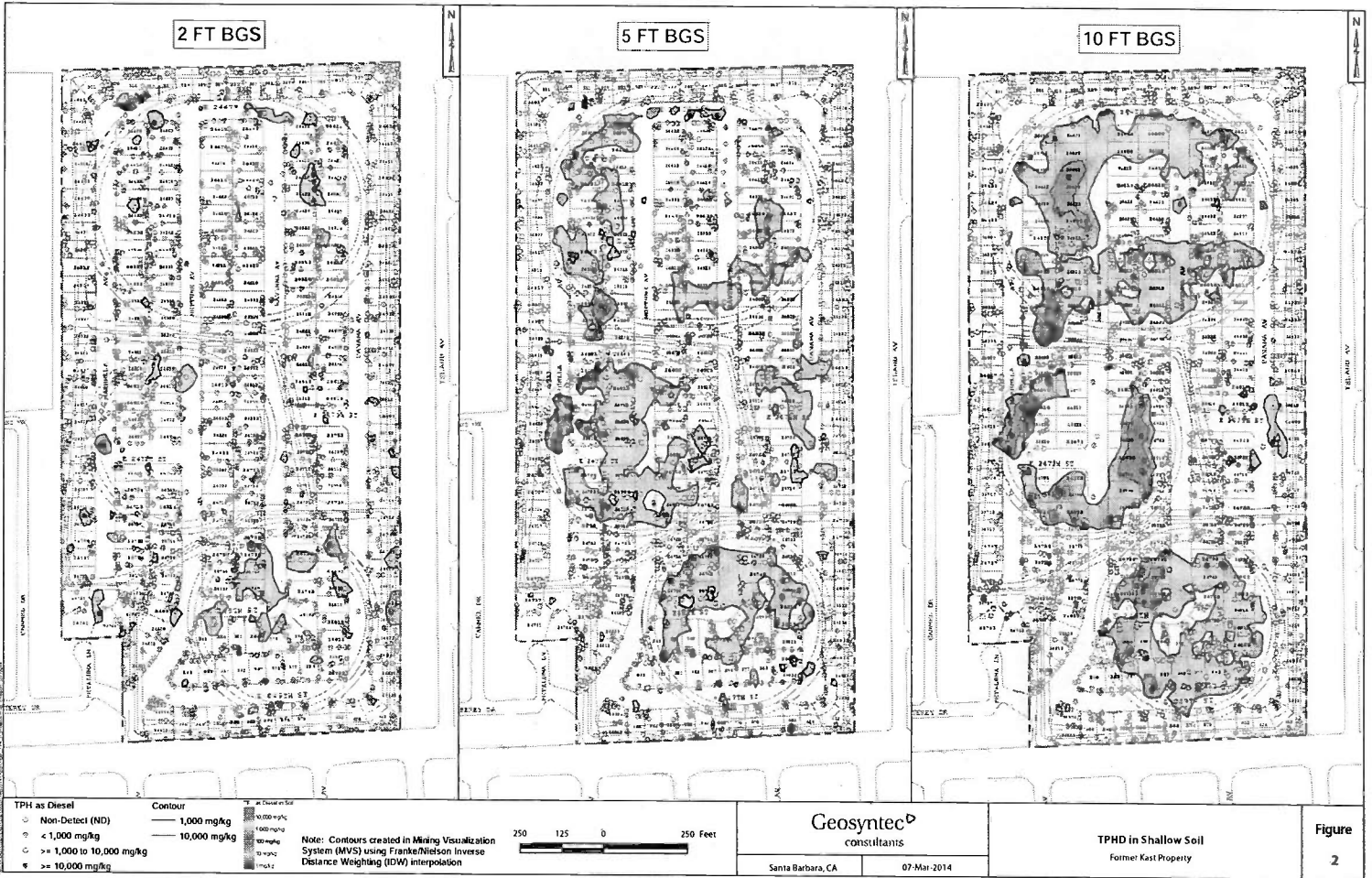
Note: Contours created in Mining Visualization System (MVS) using Franke/Nielson Inverse Distance Weighing (IDW) interpolation

250 125 0 250 Feet

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consultants  
Santa Barbara, CA      07-MAR-2014

**TPHG in Shallow Soil**  
Former Kast Property

**Figure**  
1



TPH as Diesel

- Non-Detect (ND)
- < 1,000 mg/kg
- >= 1,000 to 10,000 mg/kg
- ⊞ >= 10,000 mg/kg

Contour

- 1,000 mg/kg
- 10,000 mg/kg

at Depth of Soil

- 0-1000 mg/kg
- 1000-5000 mg/kg
- 5000-10000 mg/kg
- 10000 mg/kg

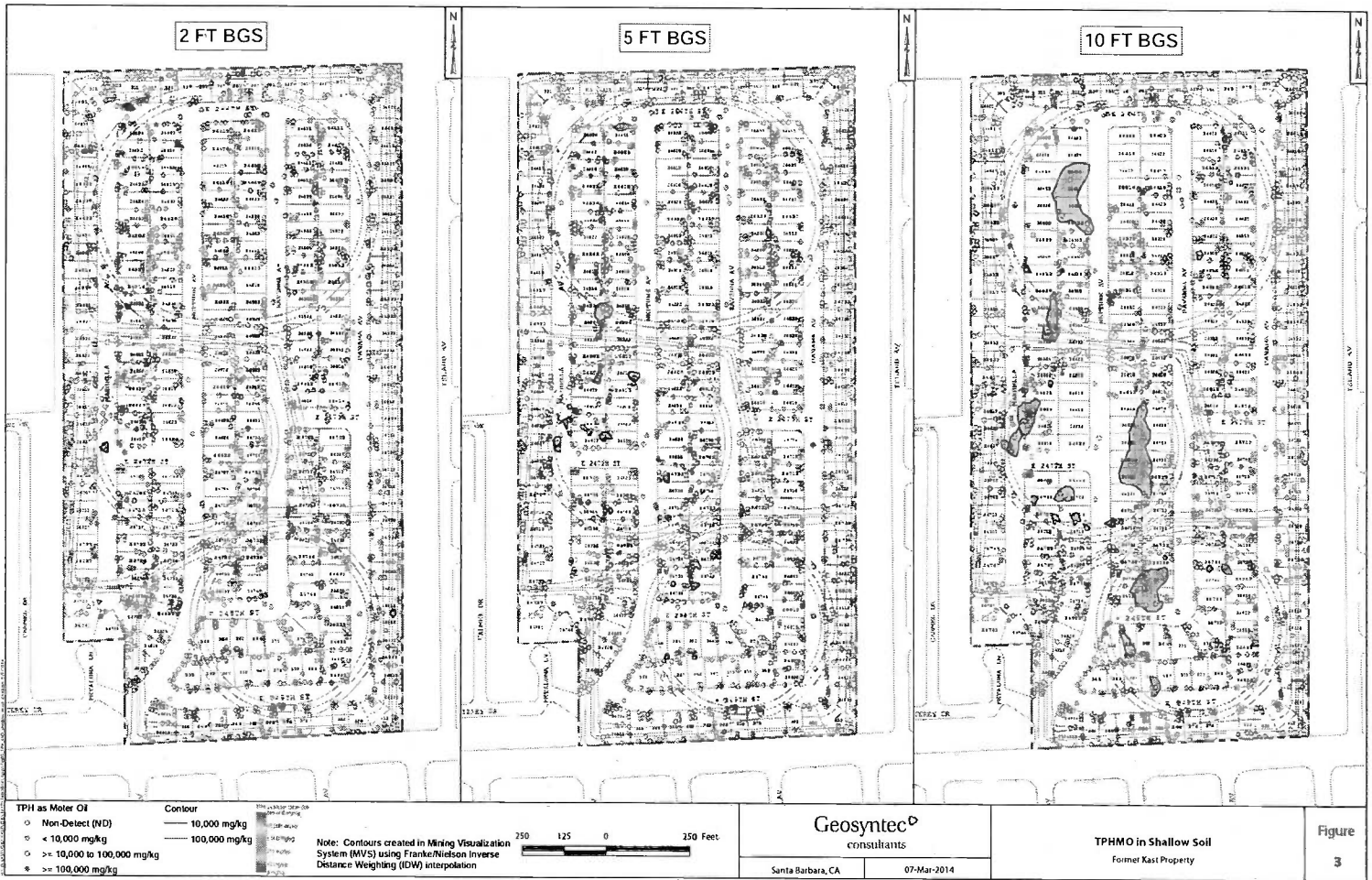
Note: Contours created in Mining Visualization System (MVS) using Franke/Nielson Inverse Distance Weighting (IDW) interpolation

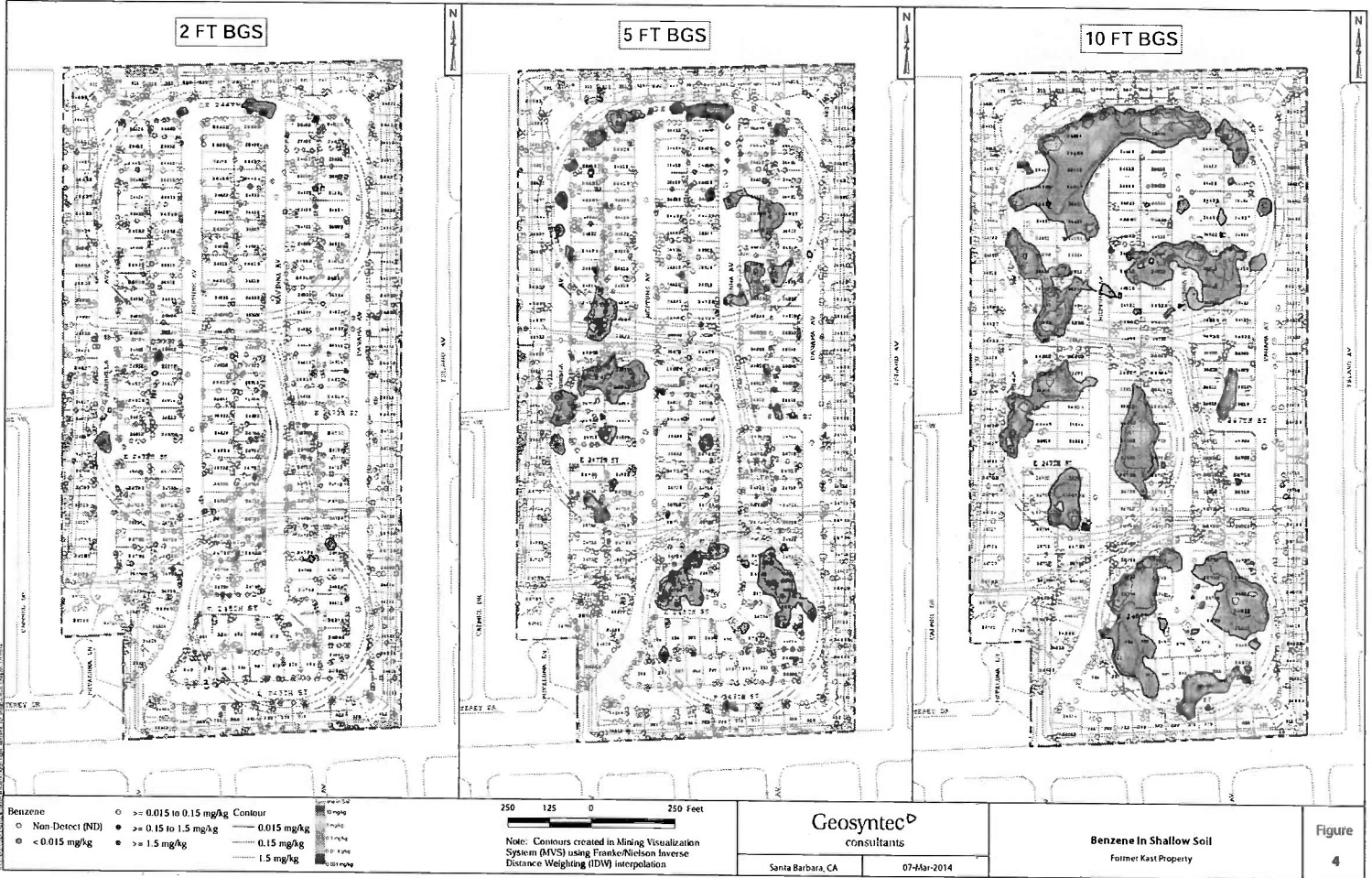


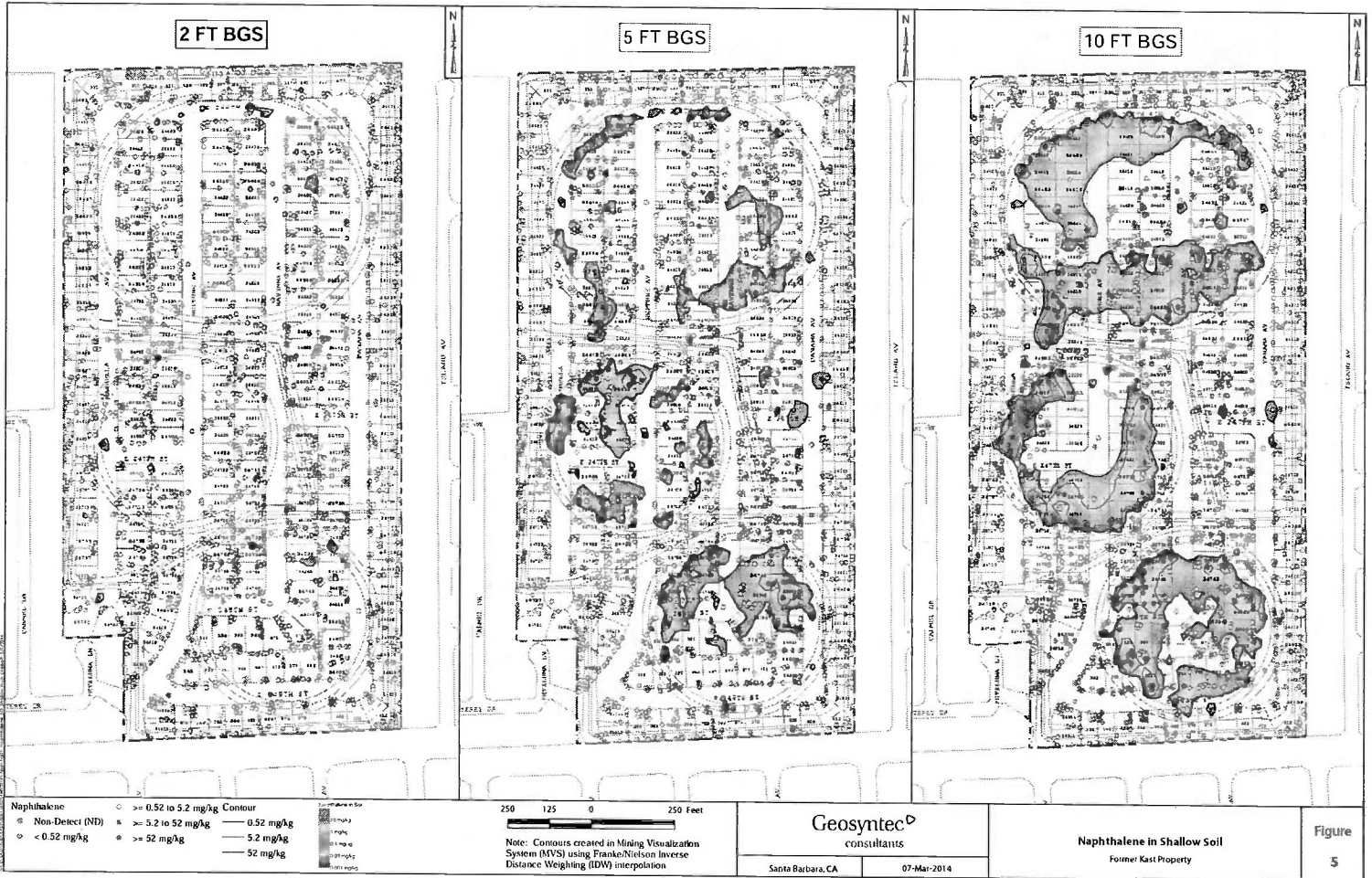
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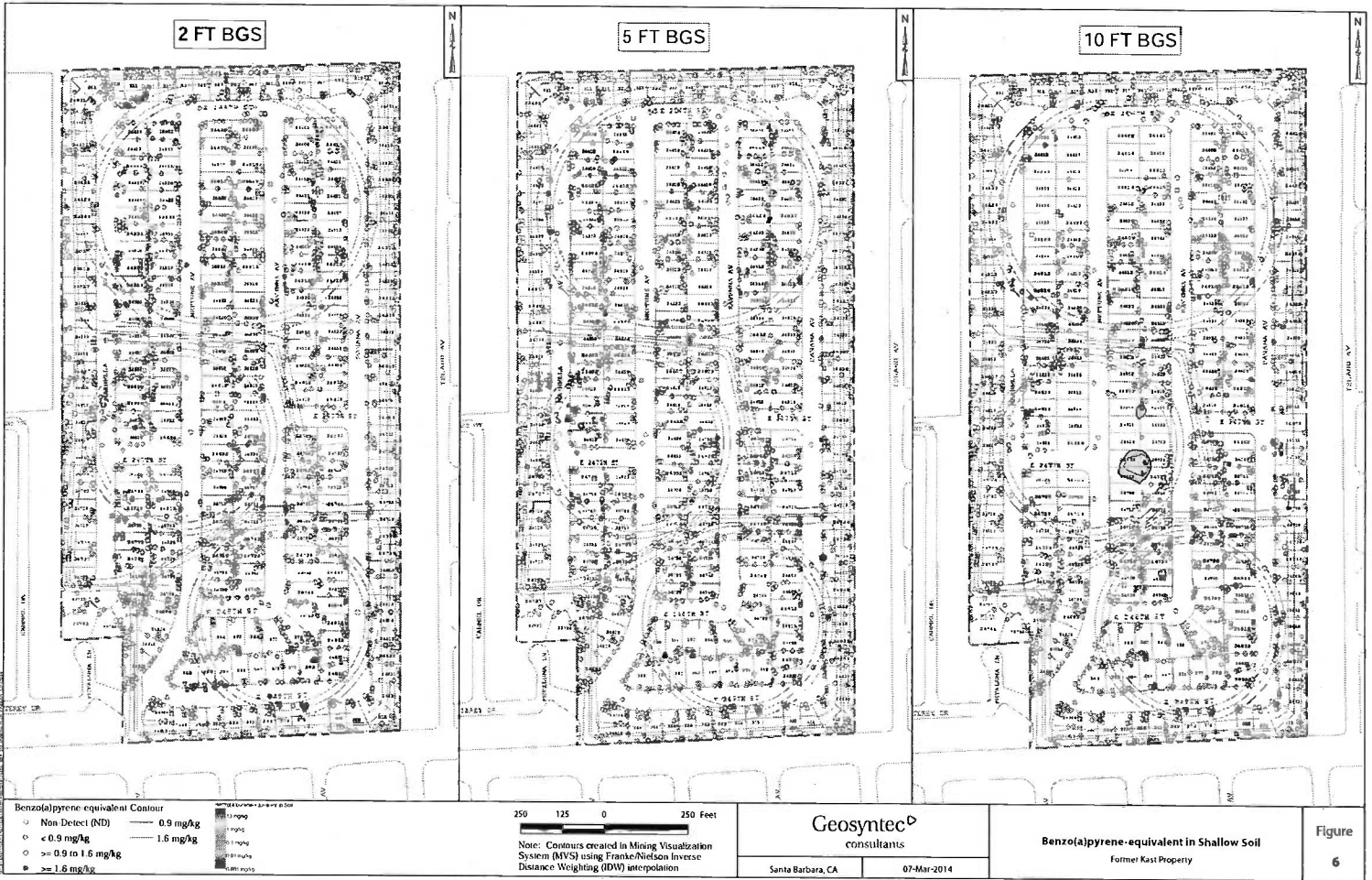
TPHD in Shallow Soil  
 Former Kast Property

Figure  
 2









**APPENDIX C**

**FOURTH QUARTER 2013 GROUNDWATER MONITORING RESULTS**

TABLE C-1  
Fourth Quarter 2013 Groundwater Monitoring Results  
Shallow Zone (Water Table Wells)  
VOCs and Hydrocarbons

LOCATION NAME			MW-01	MW-02	MW-04	MW-05	MW-06	MW-07	MW-08	MW-09	MW-09	MW-10	MW-11	MW-13	MW-14	MW-15	MW-16	MW-17	
SAMPLE DATE			10/25/2013	10/24/2013	10/23/2013	10/24/2013	10/25/2013	10/24/2013	10/25/2013	10/22/2013	10/22/2013	10/23/2013	10/21/2013	10/25/2013	10/24/2013	10/23/2013	10/22/2013	10/23/2013	
SAMPLE NAME			MW-01	MW-02	MW-04	MW-05	MW-06	MW-07	MW-08	MW-09	MW-09-DUP	MW-10	MW-11	MW-13	MW-14	MW-15	MW-16	MW-17	
SAMPLE DELIVERY GROUP (SDG)	Method	Unit	13-10-1987	13-10-1987	13-10-1749	13-10-1867	13-10-1987	13-10-1867	13-10-1867	13-10-1867	13-10-1678	13-10-1678	13-10-1749	13-10-1590	13-10-1987	13-10-1867	13-10-1749	13-10-1678	13-10-1749
1,1,1-Trichloroethane	SW8260B	UGL	0.37J	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	SW8260B	UGL	0.90J	< 1.0	< 1.0	1.3J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	SW8260B	UGL	16	< 1.0	2.0	2.4	6.1	15	3.5	< 1.0	< 1.0	2.7	< 1.0	< 1.0	0.49J	1.7	< 1.0	< 1.0	< 1.0
1,3-Dichloroethane	SW8260B	UGL	23	< 1.0	6.3	4.4	7.8	42	12	< 1.0	< 1.0	8.8	< 1.0	< 1.0	3.9	2.2	< 1.0	< 1.0	< 1.0
1,2,3-Trichloropropane	SW8260B	UGL	< 5.0	< 5.0	< 5.0	< 10	6.8	0.68J	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,2,4-Trimethylbenzene	SW8260B	UGL	< 1.0	1.2	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	7.8	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	SW8260B	UGL	3.4	< 0.50	< 0.50	< 1.0	< 0.50	0.58	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,3,5-Trimethylbenzene	SW8260B	UGL	< 1.0	1.1	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.39J	< 1.0	< 1.0	< 1.0	< 1.0
Acetone	SW8260B	UGL	< 20	< 20	< 20	< 40	< 20	< 20	< 20	< 20	< 20	11J	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Benzene	SW8260B	UGL	0.20J	1.9	2.9	12	130	0.59	47	< 0.50	< 0.50	6.2	< 0.50	480	120	11	< 0.50	0.73	< 0.50
Bromochloromethane	SW8260B	UGL	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromodichloromethane	SW8260B	UGL	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Carbon Disulfide	SW8260B	UGL	< 10	< 10	< 10	< 20	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Chloroform	SW8260B	UGL	5.8	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
cis-1,2-Dichloroethane	SW8260B	UGL	220	< 1.0	110	27	93	100	63	< 1.0	< 1.0	< 1.0	78	< 1.0	96	39	24	< 1.0	< 1.0
Dibromochloromethane	SW8260B	UGL	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Diisopropyl Ether (DIPE)	SW8260B	UGL	< 2.0	< 2.0	< 2.0	< 4.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Ethylbenzene	SW8260B	UGL	< 1.0	0.68J	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	110	7.6	< 1.0	< 1.0	< 1.0
Freon 113	SW8260B	UGL	0.97J	< 10	< 10	< 20	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Isopropylbenzene (Cumene)	SW8260B	UGL	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	18	0.88J	< 1.0	< 1.0	< 1.0
Methylene Chloride	SW8260B	UGL	< 10	< 10	< 10	< 20	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Naphthalene	SW8260B	UGL	< 10	< 10	< 10	< 20	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	66	3.6J	< 1.0	< 1.0	< 1.0
n-Butylbenzene	SW8260B	UGL	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1.4	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	SW8260B	UGL	< 1.0	1.4	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.29J	< 1.0	< 1.0	< 1.0	< 1.0
p-m-Xylene	SW8260B	UGL	< 1.0	4.3	< 1.0	< 2.0	< 1.0	< 1.0	0.30J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	2.0	0.29J	< 1.0	< 1.0	< 1.0
p-Isopropyltoluene	SW8260B	UGL	< 1.0	0.20J	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.45J	< 1.0	< 1.0	< 1.0	< 1.0
Propylbenzene	SW8260B	UGL	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	17	0.88J	< 1.0	< 1.0	< 1.0
sec-Butylbenzene	SW8260B	UGL	< 1.0	< 1.0	< 1.0	< 2.0	0.30J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	2.4	< 1.0	< 1.0	< 1.0	< 1.0
tert-Butyl Alcohol (TBA)	SW8260B	UGL	< 10	< 10	< 10	< 20	18	< 10	12	< 10	< 10	45	< 10	20	< 10	< 10	< 10	< 10	< 10
Tetrachloroethene	SW8260B	UGL	210	< 1.0	< 1.0	2.0J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	SW8260B	UGL	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.26J	< 1.0	< 1.0	< 1.0
trans-1,2-Dichloroethene	SW8260B	UGL	1.1	< 1.0	4.3	14	20	0.71J	0.89J	< 1.0	< 1.0	2.7	< 1.0	7.6	1.5	1.5	< 1.0	< 1.0	< 1.0
Trichloroethene	SW8260B	UGL	300	< 1.0	0.54J	450	< 1.0	14	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	6.5	< 1.0	< 1.0	< 1.0
Vinyl Chloride	SW8260B	UGL	< 0.50	< 0.50	1.9	< 1.0	< 0.50	0.63	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Xylenes, Total	SW8260B	UGL	< 1.0	5.7	< 1.0	< 2.0	< 1.0	< 1.0	0.30	< 1.0	< 1.0	< 1.0	< 1.0	2.3	0.29	< 1.0	< 1.0	< 1.0	< 1.0

Notes:  
 Bold text indicates results above laboratory reporting limit.  
 µg/L = micrograms per liter  
 J = Estimated value; the result is between the MDL and the RL  
 B = Analyte detected in associated blanks



TABLE C-1  
Fourth Quarter 2013 Groundwater Monitoring Results  
Shallow Zone (Water Table Wells)  
VOCs and Hydrocarbons

LOCATION NAME			MW-01	MW-02	MW-04	MW-05	MW-06	MW-07	MW-08	MW-09	MW-09	MW-10	MW-11	MW-13	MW-14	MW-15	MW-16	MW-17
SAMPLE DATE			10/25/2013	10/24/2013	10/23/2013	10/24/2013	10/25/2013	10/24/2013	10/25/2013	10/22/2013	10/22/2013	10/23/2013	10/21/2013	10/25/2013	10/23/2013	10/22/2013	10/23/2013	10/23/2013
SAMPLE NAME			MW-01	MW-02	MW-04	MW-05	MW-06	MW-07	MW-08	MW-09	MW-09-DUP	MW-10	MW-11	MW-13	MW-14	MW-15	MW-16	MW-17
SAMPLE DELIVERY GROUP (SDG)	Method	Unit	13-10-1997	13-10-1867	13-10-1749	13-10-1867	13-10-1987	13-10-1867	13-10-1987	13-10-1678	13-10-1678	13-10-1749	13-10-1590	13-10-1987	13-10-1867	13-10-1749	13-10-1678	13-10-1749
Carbon Chain C6	SW8015B	UG/L	< 50	16J	< 50	< 50	71	16J	30J	< 50	< 50	< 50	< 50	190	58	< 50	< 50	< 50
Carbon Chain C7	SW8015B	UG/L	26J	13J	< 50	< 50	9.0J	< 50	7.1J	< 50	< 50	< 50	< 50	22J	< 50	< 50	< 50	< 50
Carbon Chain C8	SW8015B	UG/L	30J	14J	< 50	< 50	19J	< 50	14J	< 50	< 50	< 50	< 50	140	18J	< 50	< 50	< 50
Carbon Chain C9-C10	SW8015B	UG/L	< 50	28J	21J	< 50	46J	18J	54	< 50	< 50	22J	< 50	320	51	20J	< 50	< 50
Carbon Chain C11-C12	SW8015B	UG/L	< 50	< 50	< 50	< 50	43J	29J	76	< 50	< 50	24J	< 50	410	40J	< 50	< 50	< 50
Carbon Chain C13-C14	SW8015B	UG/L	< 50	< 50	< 50	< 50	51	50	93	< 50	< 50	22J	< 50	380	38J	< 50	< 50	< 50
Carbon Chain C15-C16	SW8015B	UG/L	< 50	< 50	< 50	< 50	46J	69	82	< 50	< 50	22J	< 50	370	32J	< 50	< 50	< 50
Carbon Chain C17-C18	SW8015B	UG/L	< 50	< 50	< 50	24J	33J	50	130	< 50	< 50	18J	< 50	220	24J	< 50	< 50	< 50
Carbon Chain C19-C20	SW8015B	UG/L	< 50	< 50	< 50	38J	23J	45J	100	< 50	< 50	< 50	< 50	200	< 50	< 50	< 50	< 50
Carbon Chain C21-C22	SW8015B	UG/L	< 50	< 50	< 50	34J	< 50	< 50	43J	< 50	< 50	< 50	< 50	130	< 50	< 50	< 50	< 50
Carbon Chain C23-C24	SW8015B	UG/L	25J	< 50	< 50	46J	19J	25J	33J	< 50	< 50	< 50	< 50	84	< 50	< 50	< 50	< 50
Carbon Chain C25-C28	SW8015B	UG/L	19J	< 50	< 50	40J	< 50	18J	32J	< 50	< 50	< 50	< 50	52	< 50	< 50	< 50	< 50
Carbon Chain C29-C32	SW8015B	UG/L	16J	< 50	< 50	26J	8.6J	13J	23J	< 50	< 50	< 50	< 50	34J	10J	< 50	< 50	< 50
Carbon Chain C33-C36	SW8015B	UG/L	< 50	< 50	< 50	16J	< 50	9.6J	< 50	< 50	< 50	< 50	< 50	16J	8.3J	< 50	< 50	< 50
Carbon Chain C37-C40	SW8015B	UG/L	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
Carbon Chain C41-C44	SW8015B	UG/L	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
Total Petroleum Hydrocarbons (C6-C44)	SW8015B	UG/L	120	71	< 50	220	370	340	720	< 50	< 50	110	< 50	2600	280	< 50	< 50	< 50
TPH as Gasoline	SW8015B	UG/L	200HD	170HD	110HD	200HD	630HD	83HD	220HD	< 50	< 50	80HD	< 50	1500HD	260HD	120HD	< 50	< 50
TPH as Diesel	SW8015B	UG/L	66HD	73HD	44HDJ	210HD	280HD	320HD	660HD	35J	< 50	140HD	< 50	2200HD	210HD	44HDJ	39J	< 50
TPH as Motor Oil	SW8015B	UG/L	< 250	< 250	< 250	300HD	< 250HD	250HDJ	530HD	< 250	< 250	< 250	< 250	1100HD	< 250	< 250	< 250	< 250

Notes:  
**Bold text indicates results above laboratory reporting limit.**  
 µg/L = micrograms per liter  
 J = Estimated value; the result is between the MDL and the RL  
 B = Analyte detected in associated blanks

TABLE C-2  
Fourth Quarter 2013 Groundwater Monitoring Results  
Gage Wells  
VOCs and Hydrocarbons

LOCATION NAME			MW-G01D	MW-G02D	MW-G03D	MW-G04D	MW-G01S	MW-G02S	MW-G03S	MW-G04S
SAMPLE DATE			10/22/2013	10/22/2013	10/22/2013	10/23/2013	10/21/2013	10/22/2013	10/23/2013	10/24/2013
SAMPLE NAME			MW-G01D	MW-G02D	MW-G03D	MW-G04D	MW-G01S	MW-G02S	MW-G03S	MW-G04S
SAMPLE DELIVERY GROUP (SDG)	Method	Unit	13-10-1678	13-10-1678	13-10-1678	13-10-1749	13-10-1590	13-10-1678	13-10-1749	13-10-1867
1,1,1-Trichloroethane	SW8260B	UG/L	< 1.0	0.37J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	SW8260B	UG/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	SW8260B	UG/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	SW8260B	UG/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichloropropane	SW8260B	UG/L	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,2,4-Trimethylbenzene	SW8260B	UG/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.51J
1,2-Dichloroethane	SW8260B	UG/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	0.40J	2.9	< 0.50
1,3,5-Trimethylbenzene	SW8260B	UG/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Acetone	SW8260B	UG/L	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Benzene	SW8260B	UG/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	0.22J	0.20J	81
Bromochloromethane	SW8260B	UG/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1.0
Bromodichloromethane	SW8260B	UG/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.42J
Carbon Disulfide	SW8260B	UG/L	0.72J	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Chloroform	SW8260B	UG/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1.8
cis-1,2-Dichloroethene	SW8260B	UG/L	< 1.0	< 1.0	0.64J	< 1.0	< 1.0	< 1.0	13	< 1.0
Dibromochloromethane	SW8260B	UG/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.32J
Diisopropyl Ether (DIPE)	SW8260B	UG/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	0.55J	0.59J	< 2.0
Ethylbenzene	SW8260B	UG/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	4.2
Freon 113	SW8260B	UG/L	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Isopropylbenzene (Cumene)	SW8260B	UG/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Methylene Chloride	SW8260B	UG/L	< 10	< 10	< 10	< 10	< 10	< 10	< 10	1.1J
Naphthalene	SW8260B	UG/L	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
n-Butylbenzene	SW8260B	UG/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	SW8260B	UG/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p/m-Xylene	SW8260B	UG/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.61J
p-Isopropyltoluene	SW8260B	UG/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Propylbenzene	SW8260B	UG/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.23J
sec-Butylbenzene	SW8260B	UG/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
tert-Butyl Alcohol (TBA)	SW8260B	UG/L	< 10	< 10	< 10	< 10	< 10	< 10	53	120
Tetrachloroethene	SW8260B	UG/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	SW8260B	UG/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.73J
trans-1,2-Dichloroethene	SW8260B	UG/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.57J	< 1.0
Trichloroethene	SW8260B	UG/L	< 1.0	< 1.0	< 1.0	< 1.0	0.41J	< 1.0	< 1.0	< 1.0
Vinyl Chloride	SW8260B	UG/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Xylenes, Total	SW8260B	UG/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.61

Notes:  
Bold text indicates results above laboratory reporting limit.  
µg/L = micrograms per liter

TABLE C-2  
Fourth Quarter 2013 Groundwater Monitoring Results  
Gage Wells  
VOCs and Hydrocarbons

LOCATION NAME			MW-G01D	MW-G02D	MW-G03D	MW-G04D	MW-G01S	MW-G02S	MW-G03S	MW-G04S
SAMPLE DATE			10/22/2013	10/22/2013	10/22/2013	10/23/2013	10/21/2013	10/22/2013	10/23/2013	10/24/2013
SAMPLE NAME			MW-G01D	MW-G02D	MW-G03D	MW-G04D	MW-G01S	MW-G02S	MW-G03S	MW-G04S
SAMPLE DELIVERY GROUP (SDG)	Method	Unit	13-10-1678	13-10-1678	13-10-1678	13-10-1749	13-10-1590	13-10-1678	13-10-1749	13-10-1867
Carbon Chain C6	SW8015B	UG/L	< 50	< 50	< 50	< 50	< 50	< 50	< 50	49J
Carbon Chain C7	SW8015B	UG/L	< 50	< 50	< 50	< 50	< 50	< 50	< 50	12J
Carbon Chain C8	SW8015B	UG/L	< 50	< 50	< 50	< 50	< 50	< 50	12J	25J
Carbon Chain C9-C10	SW8015B	UG/L	13J	< 50	< 50	< 50	< 50	< 50	33J	41J
Carbon Chain C11-C12	SW8015B	UG/L	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
Carbon Chain C13-C14	SW8015B	UG/L	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
Carbon Chain C15-C16	SW8015B	UG/L	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
Carbon Chain C17-C18	SW8015B	UG/L	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
Carbon Chain C19-C20	SW8015B	UG/L	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
Carbon Chain C21-C22	SW8015B	UG/L	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
Carbon Chain C23-C24	SW8015B	UG/L	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
Carbon Chain C25-C28	SW8015B	UG/L	< 50	< 50	< 50	16J	< 50	< 50	< 50	< 50
Carbon Chain C29-C32	SW8015B	UG/L	< 50	< 50	< 50	17J	< 50	< 50	< 50	9.6J
Carbon Chain C33-C36	SW8015B	UG/L	< 50	< 50	< 50	11J	< 50	< 50	< 50	10J
Carbon Chain C37-C40	SW8015B	UG/L	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
Carbon Chain C41-C44	SW8015B	UG/L	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
Total Petroleum Hydrocarbons (C6-C44)	SW8015B	UG/L	< 50	< 50	< 50	< 50	< 50	< 50	< 50	150
TPH as Gasoline	SW8015B	UG/L	< 50	< 50	< 50	< 50	< 50	< 50	60HD	230HD
TPH as Diesel	SW8015B	UG/L	39J	< 50	45J	98	< 50	46J	49HDJ	82HD
TPH as Motor Oil	SW8015B	UG/L	< 250	< 250	< 250	< 250	< 250	< 250	< 250	< 250

Notes:  
**Bold text indicates results above laboratory reporting limit.**  
 µg/L = micrograms per liter

TABLE C-3  
Fourth Quarter 2013 Groundwater Monitoring Results  
Shallow Zone (Water Table Wells)  
Metals

LOCATION NAME			MW-01	MW-02	MW-04	MW-05	MW-06	MW-07	MW-08	MW-09	MW-09	MW-10	MW-11	MW-13	MW-14	MW-15	MW-16	MW-17
SAMPLE DATE			10/25/2013	10/24/2013	10/23/2013	10/24/2013	10/25/2013	10/24/2013	10/25/2013	10/22/2013	10/22/2013	10/23/2013	10/21/2013	10/25/2013	10/24/2013	10/23/2013	10/22/2013	10/23/2013
SAMPLE NAME			MW-01	MW-02	MW-04	MW-05	MW-06	MW-07	MW-08	MW-09	MW-09-DUP	MW-10	MW-11	MW-13	MW-14	MW-15	MW-16	MW-17
SAMPLE DELIVERY GROUP (SDG)	Method	Unit	13-10-1987	13-10-1867	13-10-1749	13-10-1967	13-10-1987	13-10-1867	13-10-1987	13-10-1678	13-10-1678	13-10-1749	13-10-1590	13-10-1987	13-10-1867	13-10-1749	13-10-1678	13-10-1749
Antimony	SW6020	mg/L	0.0022J	< 0.001	< 0.001	< 0.001	0.0014J	0.0011J	0.0014J	< 0.001	< 0.001	< 0.001	< 0.001	0.0013J	< 0.001	< 0.001	< 0.001	< 0.001
Arsenic	SW6020	mg/L	0.0012	0.00184	0.00633	0.266	0.014	0.0046	0.466	0.00078J	0.00071J	0.00441	0.00574	0.0534	0.00348	0.0729	0.00257	0.00061J
Barium	SW6020	mg/L	0.0823	0.114	0.186	0.118	0.43	0.335	0.506	0.154	0.149	0.386	0.187	0.536	0.166	0.131	0.16	0.0677
Chromium	SW6020	mg/L	0.00057J	< 0.001	< 0.001	0.00178	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.00047J	< 0.001	< 0.001
Cobalt	SW6020	mg/L	0.0002J	0.00021J	0.00083J	0.00047J	0.00033J	0.00125	0.00038J	0.00031J	0.0003J	0.00029J	0.00034J	0.0006J	0.00022J	0.00025J	0.0003J	0.00106
Copper	SW6020	mg/L	0.00146	0.00077J	0.00081J	0.00071J	0.00058J	0.00229	0.00135	0.00081J	0.00074J	0.00078J	0.00078J	0.00069J	< 0.001	0.00148	0.00078J	0.00089J
Lead	SW6020	mg/L	0.00011J	< 0.001	9E-05J	< 0.001	0.00011J	< 0.001	< 0.001	0.0001J	< 0.001	9E-05J	< 0.001	8E-05J	< 0.001	0.00013J	< 0.001	0.0001J
Mercury	SW7470A	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.00125	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Molybdenum	SW6020	mg/L	0.00048J	0.00051J	0.00077J	0.0069	0.00142	0.00675	0.00585	0.0014	0.00138	0.00094J	0.00263	0.00031J	0.00165	0.00089J	0.00225	< 0.001
Nickel	SW6020	mg/L	0.00677	0.00408	0.00484	0.00442	0.00598	0.0134	0.0113	0.00482	0.0042	0.00609	0.00465	0.00866	< 0.001	0.00527	0.00479	0.00604
Selenium	SW6020	mg/L	0.0097	0.00126	< 0.001	0.00234	0.00088J	0.00307	0.0006J	< 0.001	0.00023J	< 0.001	< 0.001	0.00038J	< 0.001	< 0.001	< 0.001	< 0.001
Silver	SW6020	mg/L	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.00012J	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Vanadium	SW6020	mg/L	0.0006J	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.00019J	< 0.001	< 0.001	< 0.001
Zinc	SW6020	mg/L	0.00456J	0.00237Jb	0.00535	0.00476Jb	0.00431J	0.0082b	0.00195J	0.00628	0.00652	0.0116	0.0144	0.00406J	< 0.005	0.0169	0.0867	0.0135

Notes:  
**Bold text indicates results above laboratory reporting limit.**  
 µg/L = micrograms per liter  
 mg/L = milligrams per liter  
 J = Estimated value; the result is between the MDL and the RL  
 U = Concentration is below the MDL

TABLE C-4  
Fourth Quarter 2013 Groundwater Monitoring Results  
Gage Wells  
Metals

LOCATION NAME			MW-G01D	MW-G02D	MW-G03D	MW-G04D	MW-G01S	MW-G02S	MW-G03S	MW-G04S
SAMPLE DATE			10/22/2013	10/22/2013	10/22/2013	10/23/2013	10/21/2013	10/22/2013	10/23/2013	10/24/2013
SAMPLE NAME			MW-G01D	MW-G02D	MW-G03D	MW-G04D	MW-G01S	MW-G02S	MW-G03S	MW-G04S
SAMPLE DELIVERY GROUP (SDG)	Method	Unit	13-10-1678	13-10-1678	13-10-1678	13-10-1749	13-10-1590	13-10-1678	13-10-1749	13-10-1867
Antimony	SW6020	mg/L	0.00033J	0.00013J	0.00014J	0.00021J	0.00057J	0.00017J	< 0.001	0.00044J
Arsenic	SW6020	mg/L	0.00603	0.00495	0.00901	0.00114	0.00412	0.00836	0.00696	0.0168
Barium	SW6020	mg/L	0.0117	0.0306	0.0396	0.0228	0.102	0.0139	0.227	0.0374
Chromium	SW6020	mg/L	< 0.001	< 0.001	< 0.001	0.00107	< 0.001	< 0.001	0.00552	< 0.001
Cobalt	SW6020	mg/L	< 0.001	0.00018J	0.00013J	0.0001J	0.00026J	0.0001J	0.00019J	0.00015J
Copper	SW6020	mg/L	0.00052J	0.00043J	0.00049J	0.00065J	0.00085J	0.00075J	0.00072J	0.00112
Lead	SW6020	mg/L	9E-05J	< 0.001	< 0.001	0.00012J	0.00057J	< 0.001	< 0.001	< 0.001
Mercury	SW7470A	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Molybdenum	SW6020	mg/L	0.00203	0.00085J	0.00095J	0.00065J	0.00097J	0.00409	0.00177	0.00332
Nickel	SW6020	mg/L	0.00293	0.00344	0.00319	0.00252	0.00493	0.00267	0.0047	0.00178
Selenium	SW6020	mg/L	< 0.001	0.00034J	< 0.001	< 0.001	< 0.001	< 0.001	0.00045BJ	0.00133
Silver	SW6020	mg/L	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Vanadium	SW6020	mg/L	0.00028J	< 0.001	< 0.001	0.00091J	< 0.001	< 0.001	< 0.001	< 0.001
Zinc	SW6020	mg/L	0.0642	0.00722	0.00452J	0.013	1.16	0.0151	0.00597	0.0193b

Notes:

Bold text indicates results above laboratory reporting limit.

mg/L = milligrams per liter

J = Estimated value; the result is between the MDL and the RL

U = Concentration is below the MDL

**APPENDIX D**

**SURFACE CONTAINMENT AND SOIL MANAGEMENT PLAN**

# **SURFACE CONTAINMENT AND SOIL MANAGEMENT PLAN**

## **INTRODUCTION**

URS Corporation (URS) has prepared this Surface Containment and Soil Management Plan (SMP) as part of the Remedial Action Plan (RAP) for the Former Kast Property (Site) in Carson, California on behalf of Equilon Enterprises LLC, doing business as Shell Oil Products US (Shell or SOPUS). The SMP is submitted in accordance with Cleanup and Abatement Order (CAO) No. R4-2011-0046 issued to Shell by the California Regional Water Quality Control Board – Los Angeles Region (RWQCB or Regional Board) on March 11, 2011 and the RWQCB's letter dated January 23, 2014 directing Shell to submit this RAP and Human Health Risk Assessment for cleanup of the Carousel Tract pursuant to California Water Code Section 13304.

The Regional Board is the lead Regulatory Agency for this project; however, the protocols presented in this SMP are intended to apply to all parties involved in soil disturbance activities at the Site (e.g., excavation, landscaping, utility installation), including the City of Carson, County of Los Angeles Department of Public Works, local utility providers, contractors, and residents.

## **OBJECTIVE**

This SMP provides the detailed approach to mitigate potential residential, construction, or utility worker exposure to soils that do not meet Remedial Action Objectives (RAOs) that may remain at the Site following implementation of the excavation remedy outlined in the RAP and forthcoming Remedial Design Implementation Plan (RDIP). For the purposes of this SMP, these soils will be referred to herein as "residual soils." The SMP details the long-term approach to address potential residual soils should the need arise to disturb these soils in the future. Residual soils may be present at depths below the depth of excavation, as well as in areas not excavated such as beneath homes, City sidewalks and streets.

## **BACKGROUND**

Remediation of soil, soil vapor, and groundwater is required in portions of the Site to meet RAOs, as approved by the Regional Board. In accordance with the CAO, this SMP specifies on-going monitoring requirements for residual soils that will remain in place after remedial excavation. The SMP summarizes protocols for containment, monitoring, and management of such residual soils. This SMP is designed to be used in conjunction with existing administrative controls (e.g., City of Carson and Los Angeles County Codes regarding construction, grading, landscaping, and excavation and encroachment permits).

Site-related constituents of concern (COCs, those COCs associated with the historic use of the Site as an oil storage facility) consist of petroleum hydrocarbon-derived constituents and some metals. In addition, other chemicals have been detected in Site soils that are unrelated to the former Site use as an oil storage facility and are referred to as non-Site-related COCs.

Proposed remedial actions include excavation to 3 feet bgs in open areas and areas covered by residential hardscape, including residential planters, walkways, and uncovered patios at properties where risk estimates are above regulatory thresholds or may pose a concern for the potential leaching to groundwater pathway. Soil will not be excavated from properties from areas beneath homes, City sidewalks and streets. Excavated areas will be backfilled with clean imported soils and landscaping/hardscaping will be restored to like conditions. The backfilled clean soil and landscaping will provide a protective barrier to minimize the potential for exposure to soils below the depth of excavation. Soils below a depth of 3 feet and soils beneath surface containment features will be addressed through a soil vapor extraction (SVE) and bioventing system that will include installation of SVE/bioventing wells both in City streets and on residential properties where RAOs are not met based on existing conditions.

This Soil Containment and Soil Management Plan outlines procedures so that residents or construction/utility workers are not inadvertently exposed to soils that exceed the RAOs for the Site.

## **SURFACE CONTAINMENT**

Physical barriers (e.g., presence of clean soil to a depth of 3 feet, hardscape, or structures) will serve to contain and/or prevent exposure to underlying impacted soils on a property and will restrict access and exposure to deeper soils. In areas where impacted soils will be excavated to 3 feet bgs, the certified clean imported soil backfill will serve as a soil barrier restricting exposure to underlying soils. Additionally, Site soils that meet RAOs will provide surface containment preventing contact with underlying residual soils. Where soils are not removed as part of the remedial excavation, the existing cover (consisting of concrete foundations and floor slabs of houses, garages, City sidewalks, street pavement, etc.) will provide a protective barrier to minimize the potential for exposure to impacted soil below. Site features, such as homes, garages, City sidewalks, and roads are considered part of the protective barrier.

## **MANAGEMENT OF RESIDUAL SOILS CONTAINING SITE COCs ABOVE SSCGs**

Following remedial excavation, residual soils may remain below 3 feet bgs and beneath homes, garages, streets and City sidewalks. The potential for contact with these residual soils will be mitigated by the surface containment features described above, except in limited instances where excavation deeper than 3 feet may be necessary. Because City Code requires permits for excavations deeper than 3 feet, there is an administrative control already in place to restrict potential contact with these deeper soils (i.e., a permit requirement). This administrative control and notification mechanism is further discussed below.

Based on the distributions of COCs on each property (e.g., Figures 3-3 through 3-8 and Appendix B of this RAP), Shell will have a means to identify soils remaining after remedial excavation and remedial system installation that do not meet RAOs. This will provide a sufficient summary of the residual soils remaining at the Site to allow any entity performing future excavations at the Site to anticipate the environmental conditions they may encounter. It is anticipated that SVE/bioventing will reduce levels in residual soils to meet RAOs within approximately 30 years (see Section 8.2.4 of the RAP).



## Administrative Controls

In their January 23, 2014 letter, RWQCB states that excavation to a depth requiring a grading permit under Los Angeles County building code “is supportive of unrestricted residential use because institutional controls are already in place...” (RWQCB, 2014a). RWQCB notes that in the Carousel Tract, the Los Angeles County building code is administered by the City of Carson. RWQCB states as follows: “Because the City of Carson must be notified and approve excavations below five feet, the City could readily inform residents and workers of other appropriate precautions necessary for excavations below five feet through existing administrative processes.” The LA County building code, therefore, acts as an applicable or relevant and appropriate requirement (ARAR) for excavations deeper than five feet at the Site.

While the statements above refer to the County requirement of Grading Permits for excavations 5 feet or deeper, the City of Carson has amended L.A. County building code Section 7003.1 to require a Grading Permit for excavations 3 feet or deeper. City of Carson Building Code Section 8105 (amending the L.A. County Building Code) states that:

*A Grading Permit shall not be required for:*

- 1. An excavation which (a) is less than three (3) feet in depth below natural grade, or (b) does not create a cut slope greater than three (3) feet in height and steeper than one and one-half (1-1/2) horizontal to one (1) vertical.*
- 2. A fill not intended to support structures and which does not obstruct a drainage course if such fill is placed on natural grade that has a slope not steeper than three (3) horizontal to one (1) vertical and (a) is less than one (1) foot in depth at its deepest point, measured vertically upward from natural grade to the surface of the fill, or (b) does not exceed twenty (20) cubic yards on any one (1) lot.*

Thus, the City of Carson has amended L.A. County building code Section 7003.1 to require a Grading Permit for excavations deeper than 3 feet, and these existing institutional controls support the 3-foot soil excavation remedy. Because the City must be notified and approve excavations deeper than 3 feet (City of Carson Building Code §8105 amending Los Angeles County Building Code §7003.1), the City could readily inform residents and workers of appropriate precautions necessary for excavations below 3 feet through an existing administrative processes, and also notify Shell that monitoring and disposal of residual soils may be required.

Shell intends to coordinate with the City of Carson to establish a process through existing building and grading permit reviews, General Plan overlay or footnote, area plan, or similar process, to ensure that if a property owner plans to conduct activities involving excavations greater than 3 feet deep (such as building renovation, installation of a pool or deeper landscape alterations), Shell is notified so that it can arrange for sampling and proper handling of impacted soils that may be present. It is expected that, based on the City permitting requirements, redistribution of deep soils to the surface at

these properties will not be permitted. An example of such an enhancement is in use at the Del Amo Soil and NAPL OU site.<sup>1</sup>

Because an institutional control is already in place in the City of Carson requiring grading permits in order to excavate at depths below 3 feet, these requirements are not expected to interfere with the unrestricted resident's use and enjoyment of their property.

Activities that may disturb impacted soil (e.g., excavation, grading, trenching, filling, earth movement, or removal of soil) below a depth of 3 feet require advance notification to the City of Carson. A mechanism will be established with the City for notification to be made to the Regional Board and Shell. The property owner(s) would be directed to provide advance notice of plans to conduct construction activities that may encounter residual impacted soil. If advance notice is impractical, such as during urgent or emergency utility work, notice should be provided as soon as practical after the work begins, so that Shell may arrange for sampling and proper handling of impacted soils that may be present.

Additionally, Shell's consultants are and will continue to be set up within the Underground Service Alert (USA) one-call system to receive notification of planned excavation work in the Carousel Tract. Upon notification of planned excavations, Shell or its representatives will coordinate with the entity that contacted USA (whether the homeowner or their representative, a homeowner's contractor, or utility company such as Cal-Water, Southern California Gas Company, or AT&T) to provide monitoring, management, handling and proper disposal of residual soils during excavation activities.

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<sup>1</sup> At the Del Amo Soil and NAPL OU site, the site remedy includes multiple layers of institutional controls (ICs) used in conjunction to protect site workers and the public from potential exposure to site contaminants. One of the layers of the ICs is called the "Permit Review IC", which is currently active as a pilot program. For this Permit Review IC, the responsible parties (including Shell), USEPA, and DTSC worked together with the City of Los Angeles to place "flags" in the Los Angeles Department of Planning's Zoning Information and Map Access System (ZIMAS) database for the parcels that make up the Del Amo site. Flags alert City staff and applicants of special conditions or restrictions that apply to a specific parcel. These flags provide information and instructions to City employees and permit applicants who propose development in identified locations that require grading/excavation or building permits. The flag informs the user that the parcel's location requires contact with EPA's project team for an environmental review. As building permit applications are reviewed by the City of Los Angeles Building and Safety Department, applicants are referred to EPA's Environmental Review Team (ERT) to review construction plans and determine whether contaminated soil or groundwater would be encountered. The ERT is currently composed of EPA, DTSC, along with the responsible parties.

With this IC pilot program, the responsible parties serve as the point of contact for permit applicants. The responsible parties conduct an initial review by obtaining information from the applicant regarding the nature of the proposed construction project, proposed land use, and locations and depths of excavations. If the proposed project involves applicable soil penetration, EPA issues a letter to the applicant that outlines specific actions to be taken prior to or during the construction process that are necessary to protect human health and the environment, or that states that the project can proceed without further evaluation.

## **Monitoring**

A number of types of monitoring may be performed to support excavation activities, depending on the volume and extent of excavation. Appropriate monitoring for dust, odor, and vapors will be conducted. Where required, Shell will offer to perform monitoring if not otherwise being performed by party doing the work. At a minimum, real-time monitoring of the work area and excavations will be conducted using a photoionization detector (PID) during excavation operations. Monitoring may also be conducted with a flame-ionization detector (FID) for methane in the parts per million by volume (ppmv) range and a four-gas meter for methane in the percent level, oxygen, carbon dioxide, and hydrogen sulfide. Monitoring for odors may also be conducted based on worker perception, at the downwind property boundary of the residential property where excavation is occurring.

To mitigate offsite dust migration and resultant impacts to neighboring properties, dust monitoring will be conducted for large excavations. If visible dust is encountered, periodic watering of the active excavation areas will be recommended throughout the excavation and backfill activities. In addition to dust suppression efforts, odor suppressants will be recommended to mitigate offsite migration of odors from the work area.

## **Soils Management**

As discussed above, notification through participation in the USA system or City of Carson permit requirements will allow Shell's representatives to collect appropriate samples and arrange for disposal of soil generated from utility work, if appropriate. If excavation of the soil is necessary for residential or utility provider construction activities, it is likely that impacted soil will not be suitable for re-use. Shell will, if requested by the property owner or utility service provider, arrange for the removal, transportation, and offsite disposal by a qualified waste contractor of residual soil. If potentially impacted soil is observed during urgent or emergency construction activities (e.g., a gas line repair), and an authorized representative is not onsite, Shell should be notified as early as possible to allow the material to be profiled and properly disposed. If Site soils are being excavated on an urgent basis, the property owner or contractor should ensure that potentially affected soil is segregated and stockpiled to allow for proper soil profiling and management.

After receiving notification that potentially impacted soil will be encountered during the course of construction activities, Shell will arrange for a contractor to collect samples of the soil (either in situ or from a segregated stockpile) for profiling purposes if an updated waste profile is needed.

To the extent possible, impacted soil will be direct loaded into approved waste containers for transport to the appropriate recycling or disposal facility. With advance notice, Shell will provide suitable containers based on the nature of the excavation work being conducted. In the event that it is necessary to temporarily stockpile soil onsite before loading, soils should be placed upon plastic sheeting and covered with plastic until they can be loaded into approved waste containers to be provided by Shell.

Excavated impacted soil will be transported offsite to appropriately licensed recycling/disposal facilities by a state-licensed waste hauler for appropriate recycling or disposal. To the extent possible, soils will be pre-profiled, and approval will be obtained from the recycling/disposal facilities before excavation activities begin. All documentation pertaining to waste disposal profiles and waste disposal acceptance will be in place prior to any offsite shipments of waste.

## **CONTACTS**

Information regarding the implementation of this SMP can be obtained by calling the Regional Board project manager at the number listed below. Other governmental agencies that may be responsible for implementing the Soil Management Plan include the SCAQMD, Los Angeles County Department of Public Works, Los Angeles County Fire Department, Los Angeles County Department of Health, and the City of Carson.

If you have any questions or wish to discuss the project, please contact:

Teklewold Ayalew, PhD, PG  
Regional Board Project Manager  
(213) 576-6739  
[tayalew@waterboards.ca.gov](mailto:tayalew@waterboards.ca.gov)

Shell's Kast Community Information Line  
(310) 857-2335  
[info@kastproperty.com](mailto:info@kastproperty.com)

**APPENDIX E**  
**PRELIMINARY RELOCATION PLAN**

# PRELIMINARY RELOCATION PLAN

## Introduction

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As part of the Remedial Action Plan (RAP), Shell Oil Products US (SOPUS or Shell) will provide temporary alternative accommodations to eligible residents of properties while remedial actions (in particular remedial excavations) are performed in the yards of their residences, in compliance with recommendations of the Human Health Risk Assessment, Feasibility Study, and RAP, and under the oversight of the Los Angeles Regional Water Quality Control Board (RWQCB or Regional Board). During remedial excavation, backfill, and restoration work, residents of the properties where excavation is conducted will be temporarily relocated as described herein. Following backfill and utility and hardscape restoration, residents would move back into their homes during landscape restoration and fence/block wall construction, or, at their option, wait to return until after the landscape restoration work is completed.

Residents of properties adjacent to locations where excavations are occurring will be offered alternative accommodations if it is necessary based on the nature of the excavation work, the potential for interruptions of access to the property, or due to disruptions in utility service to the property. Relocation of residents at adjacent or nearby properties will include services and security as described herein.

This is an overview of the Program and the services being offered. If desired by a resident, a Cartus Program counselor will be available to review a resident's particular needs during relocation and present the Program features and options available.

## About the Program

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The Program is being offered to eligible residents of properties where excavation will be performed that may cause a temporary inconvenience to the residents and necessitate temporary alternative living arrangements during excavation and restoration.

The Program:

- Offers a payment that can be applied towards temporary living expenses for the members of the household living at the residence;
- Provides assistance, if desired, with making temporary living arrangements and/or hotel accommodations billed directly to Cartus, a Shell contractor;
- Provides an inconvenience allowance as part of the payment.

Cartus, a nationwide real estate services company, will administer the Program.

Alternative accommodations may be offered on a case-by-case basis to residents of neighboring properties to minimize disruptions (due to interruptions of access to the property resulting from

equipment staging, or due to disruptions in utility service to the property, noise, or other conditions) to those residents.

### **Program Eligibility**

Residing owners or tenants of a residential property that qualifies for temporary living arrangements (as determined by Shell or its consultants/contractors as set forth above) due to remediation-related excavation activities are eligible for the Program.

It is a requirement of the Program that the resident sign a “Use of Home and Acknowledgement of Payment to Occupants” form in order to receive program benefits. Please see Attachment A – “Use of Property and Acknowledgement of Payment of Occupants.”

## **Planned Remediation Activities**

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### **Overview**

As described in the RAP, Shell intends to conduct the following multi-media remedial actions for the Site:

- Excavation of shallow soils on impacted residential properties based on the findings of the Human Health Risk Assessment and protection of groundwater criteria, as specified in the RAP.
- Soil vapor extraction (SVE) to address volatile petroleum hydrocarbons, volatile organic compounds (VOCs) and methane in soil vapor where appropriate and to promote degradation of residual hydrocarbons in deeper soil following shallow soil excavation. SVE wells will be installed in City streets and on residential properties, as appropriate.
- Bioventing to induce oxygen levels in subsurface soils to promote microbial activity and degrade longer-chain petroleum hydrocarbons. Bioventing will work in conjunction with SVE.
- Sub-slab mitigation at a limited number of properties where sub-slab soil vapor concentrations exceed site-specific cleanup goal values.
- Continued recovery of crude oil floating on the water table from two wells located on Marbella Avenue.
- Continued groundwater monitoring to support monitored natural attenuation for groundwater. Additional groundwater remedial actions may be undertaken in the future, but it not expected that these actions will affect residences.

Of these activities, excavation of shallow soils is the only activity anticipated to require temporary relocation of residents of the affected properties. Based on findings of the Human Health Risk Assessment, Shell will excavate shallow soils at approximately 183 residential properties to a depth of 3 feet below existing grade where the presence of soil impacts results in estimates of incremental lifetime cancer risk and non-cancer hazard that are above regulatory thresholds or may pose a concern for the potential leaching to groundwater pathway.

Soils will be excavated from both landscaped areas and areas currently covered by hardscape, including walkways, driveways, and patio areas. Hardscape and landscaping will be removed during the initial stage of excavation and restored to like conditions following completion of excavation. Shell also anticipates that it may be necessary to remove fences and block walls between yards and ornamental or partitioning walls on individual properties, as the depth of excavation will exceed footing depths. If possible, fences and walls will be protected in place and not removed; however, they will be removed and restored if necessary. As with other hardscape, fences and walls will be restored following completion of excavation along with restoration of landscaping. Exceptions to excavation beneath hardscape include patios covered by structures and roofs and pool decking surrounding swimming pools. These hardscape areas will not be excavated to avoid structural demolition and potential damage to swimming pools and appurtenant equipment.

Following approval of the RAP, a Site-wide Remedial Design and Implementation Plan (RDIP) will be prepared along with a Property Specific Remediation Plan (PSRP) for each property that requires remedial action. As part of PSRP preparation, Shell contractors will meet with homeowners and/or residents, and their legal representatives to obtain necessary information for relocation during remedial implementation and to discuss hardscape and landscape restoration.

Remedial excavation is anticipated to proceed in phases, if possible with each phase of work including approximately eight contiguous properties. Each phase will include homes on both sides of a city block (e.g., the east side of Marbella and west side of Neptune Avenues). This approach will be used so that if it is necessary to remove back fences or block walls, the fences can be removed one time and excavation conducted in both yards before the fences are restored.

Preliminarily, it is estimated that excavation and backfill will take approximately 3 weeks per property with site restoration taking approximately an additional 3 to 4 weeks. Approximately seven weeks would be needed to complete a phase of eight properties. Thus, residents may be relocated for a period of approximately seven weeks, with potential for shorter or longer durations. Following backfill and utility and hardscape restoration, residents would move back into their homes during landscape restoration and fence/block wall construction, or, at their option, wait to return until after the landscape restoration work is completed.

## **Temporary Living Assistance**

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### **Overview**

The goal of the Program is to provide eligible households with financial assistance toward the temporary living expenses that participants may incur due to temporary relocation during remediation activities. In addition, if desired, assistance with temporary living arrangements may be provided.

### **How the Program Assistance Payment is Established**

At least two weeks prior to the relocation date, a meeting will be held with the residents to provide information about financial assistance to facilitate relocation, including relocation or boarding of pets and assistance with transportation, if needed. Residents will be asked for general information about persons living in the home, such as the number of adults and children and the ages of the children. Special needs, such as long-term vehicle storage, special medical needs, or transportation needs will



be discussed and accommodations will be made to ensure the relocation is as comfortable as possible for the residents. Refer to Attachment B for information to be obtained during the interview. Once the interview is completed, a financial assistance calculation will be completed and the residents will be informed of the amount to be provided.

### **Assistance with Temporary Living Arrangements**

Residents will have the option to stay at a hotel of their choice and make their own arrangements subject to the daily payment amounts provided below. If requested, residents may choose to stay at a hotel arranged by and direct billed to Cartus. Available hotels for direct billing include:

- Marriott Residence Inn Torrance, 3701 Torrance Boulevard, Torrance, California;
- Marriott Residence Inn Manhattan Beach, 1700 North Sepulveda Boulevard, Manhattan Beach, California;
- Marriott Courtyard Torrance, 2633 Sepulveda Boulevard, Torrance, California;
- Marriott Residence Inn Downtown Long Beach, 600 Queensway Drive, Long Beach, California; and
- Marriott Residence Inn Long Beach, 4111 East Willow Street, Long Beach, California

In either instance, Shell will pay any pet fees charged by the hotel.

If requested, Cartus can make the initial reservations and will provide contact information at the hotel in case any changes need to be made. In addition, direct billing can be set up for the room, pet fees, and tax. However, all other expenses (meals, etc.) shall be paid directly by the participating residents. Meals and other miscellaneous assistance based on the family profile will be provided in the payment amount. Any damage to hotel rooms, furnishings or other property during relocation periods will be the responsibility of the relocated residents.

### **Program Payment**

The Program will provide eligible participants with assistance towards the temporary living expenses such as lodging and meals that may be incurred as a result of the remediation being completed at their home. The Program payment will be calculated by Cartus and will be communicated after the interview conducted as part of the RDIP and PSRP process.

Payment will be provided in the form of funds loaded onto one debit card per property. As noted above, the resident will need to sign a "Use of Property and Acknowledgement of Payment to Occupants" form in order to receive the payment. Please see Attachment A for further information.

Shell will provide relocated residents a daily meal allowance of \$71 per day per adult, and \$36 per day per child. These amounts are based on the 2014 Federal per diem allowance for the Los Angeles area (<http://www.gsa.gov/portal/category/100120>). For the purposes of meal allowance calculations, a child is considered a person 12 years of age or younger. If a resident chooses to make their own hotel arrangements, the hotel allowance is \$165 per night per room, based on 2 people per room. This amount is higher than the 2014 Federal per diem allowance for the area. Additionally, an inconvenience allowance will also be provided.